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Experienced Teachers Use of Time in Choral Rehearsals of Beginning and Advanced Choirs

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THE FLORIDA STATE UNIVERSITY
SCHOOL OF MUSIC

EXPERIENCED TEACHERS USE OF TIME IN CHORAL
REHEARSALS OF BEGINNING AND ADVANCED CHOIRS

By

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Dedicated to the students and faculty, present and past, of the
Leon High School Choral Department.

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TABLE OF CONTENTS

List of Tables	vi
Abstract	viii
<u>Chapter</u>	
1. INTRODUCTION	1
Introduction	1
Need for the Study	5
Definitions, Categories, and Abbreviations used in the Study	6
2. REVIEW OF LITERATURE	8
Importance of Empirical Definitions of Pace	8
Teacher Behaviors and Skills	9
Personal Communication Skills	13
Student Attentiveness	15
Teacher and Student Interaction	17
High and Low Magnitude	
Direct Instruction Model	
Feedback	
Teacher Intensity	
Use of Time in the Classroom	27
Descriptions of Pacing	30
Timing Characteristics	
Cox Rehearsal Structures	
Alternation of Activities	
Direct Instruction	
Need for the Study	40
3. METHODOLOGY	42
Subject	42
Descriptions of Pace	44
Rehearsal Structure	
Elements of Time	
Direct Instruction	

Procedure	46
Data Analysis	47
Categories of Behaviors	
Describing the Data	
4. RESULTS	52
Summary of Purpose	53
Rehearsal Descriptions	53
Time Measurements	
Percentages of Time	
Frequency of Behaviors	
Durations of Behaviors	
Rates per Minute of Behaviors Changes	
Initial Rehearsal Minutes (Rehearsal Segment 1)	63
Description	
Percentage of Time	
Behaviors	
Rate per Minute of Behaviors	
Highest Rate per Minute	
Lowest Rate per Minute	
Applying Descriptions of Pace	68
Rehearsal Structures	
Rehearsal Planning by Subjects	
Determining Faster or Slower Pacing	
Teacher A	72
Teacher B	82
Teacher C	93
Teacher D	103
Teacher E	114
Summary	124
5. DISCUSSION	126
Rehearsal Structures	
Elements of Time	
Direct Instruction	
Future Study	
APPENDICES	139
REFERENCES	194
BIOGRAPHICAL SKETCH	204

LIST OF TABLES

	Page
1. Descriptions of Subjects	44
2. Symbols Used in Data Analysis	49
3. Number of Rehearsal Segments	53
4. Rehearsal Segments: Duration in Seconds	54
5. Rehearsal Segments: Shown as Percentages	55
6. Frequency of Teacher and Student Behaviors	58
7. Mean Duration in Seconds of Teacher and Student Behaviors	59
8. Mean Duration of Behaviors Shown in Seconds	61
9. Rate per Minute of Behavior/Activity Alternation	62
10. Seconds Elapsed Before Initial Teacher Behavior	64
11. Cox Rehearsal Structures Used in Ten Rehearsals	69
12. Rates and Durations Used to Indicate Fast or Slow Pace	70
13. Description of Teacher A	72
14. Teacher A-Beginning Choir	77
15. Teacher A-Advanced Choir	79
16. Teacher A-Summary: Beginning and Advanced Choir	81
17. Description of Teacher B	82
18. Teacher B-Beginning Choir	88
19. Teacher B-Advanced Choir	90
20. Teacher B-Summary: Beginning and Advanced Choir	92
21. Description of Teacher C	93
22. Teacher C-Beginning Choir	98
23. Teacher C-Advanced Choir	100
24. Teacher C-Summary: Beginning and Advanced Choir	102
25. Description of Teacher D	103
26. Teacher D-Beginning Choir	109
27. Teacher D-Advanced Choir	111
28. Teacher D-Summary: Beginning and Advanced Choir	113

29.	Description of Teacher E	114
30.	Teacher E-Beginning Choir	119
31.	Teacher E-Advanced Choir	121
32.	Teacher E-Summary: Beginning and Advanced Choir	123

ABSTRACT

The purpose of this study was to investigate instructional pace by observing choral rehearsals of experienced teachers, describing teacher and student behaviors, and comparing usage of time to multiple descriptions of pacing drawn from the literature.

Five teachers were selected based on professional and educational qualifications. Subjects were videotaped in two rehearsals, one regular rehearsal of their beginning choir and advanced choir. Teacher and student behaviors were observed and recorded in seconds for analysis. Categories of behaviors were developed using existing categories from previous studies as models.

Six of the 10 rehearsals used a rehearsal structure that varied familiar with new music, easy with difficult and changed pace frequently (Cox, 1989, Structure C). After behaviors were recorded and analyzed, the beginning choirs showed a mean of 4.5 rehearsal segments (major activity shifts), advanced choirs showed a mean of 3.8 rehearsal segments, and all 10 recorded at least 3 rehearsal segments. The shortest rehearsal segment was 4.6% of the total rehearsal time, and the longest was 49.7%. All observed rehearsals contained examples of faster and slower pacing. Consistent with previous studies, teacher instruction and student performance were the highest recorded behaviors. Mean durations

of teacher instruction were 17 and 16 seconds (beginning and advanced) and 26 and 31 seconds of student performance (beginning and advanced). The lowest rate per minute (change of activity) for any rehearsal segment was .75 and the highest rate per minute was 7.7. The mean rate per minute for beginning choirs was 2.94 (teacher) and 3.04 (student). For advanced choirs the mean rate per minute was 3.53 (teacher) and 2.74 (student). Three teachers were more approving than disapproving and ratios of student response to teacher feedback varied widely from 2:1 to 6:1.

These results indicate pacing is a complex part of effective teaching and good teachers with classroom experience use fast and slow pacing in rehearsals, suggesting that slow may play an important role in pace within the full rehearsal. Pacing a choral rehearsal is an essential part of a music teacher's repertoire of effective teaching strategies, thus more study is needed.

CHAPTER ONE

INTRODUCTION

Educators daily face a common dilemma; how to best facilitate student learning in an efficient, timely manner. While many attributes are valuable in a master teacher, none is more vital than skills and teaching strategies that maximize the use of time. During in the past twenty years, research has focused on the complex relationships between teacher and student and how to best structure the classroom environment so that goals can be met and learning becomes a positive, even enjoyable experience for the students and the teachers.

Master teachers are generally known for their intuitive sense of timing; knowing when to change the pace of the lesson, when to change activities, incorporating down time at just the right moment. Much like an actor whose sense of timing and pacing marks the difference between the rank amateur and the celebrity, these teachers have “it.” Observing these teachers in an effort to describe that quality that sets them apart is not only useful but also necessary if we are to equip teachers with the skills and strategies needed as master teachers, and specifically master teachers of music.

Music classrooms are unique and complex social units designed to facilitate student learning in the art of making music. Investigations over the past two decades have identified and described variables observed to have either a positive or negative impact on student learning in the music classroom. Many of these variables are teacher behaviors that can be measured (Madsen & Madsen, 1998).

How teacher behaviors affect the classroom presupposes that there must actually be students inside the music classroom. Unlike most academic subjects, not all public schools require credits in music. Thus, a student must choose to be there and choose to remain if we are to teach them. The motivation for students enrolling in music classes has been investigated and personality of the director was the single most important factor in attracting students (Sanders & Browne, 1998). Social skills also have been shown to be a strong indicator of potential success as a teacher, requiring that the music teacher be especially adept at blending the rigors of music study with the delights of creating and experiencing music.

While director personality is a strong motivator for enrollment and important in retention of students, it is not the primary reason identified for student retention in music programs. Musical outcomes of a quality music education are powerful reinforcers, and the aesthetic joy of creating and recreating is what keeps students and teachers coming back for more of what has been described as self-knowledge (Elliott, 1995.)

Seeking to identify and describe behaviors of effective teachers, studies in the recent past have moved to incorporate more than what to teach, or how to teach, to include the more illusive when to teach. How teachers structure activities and behaviors across time is important to observe and analyze. Teachers cannot be effective and student learning cannot be achieved if classroom behaviors and activities are not structured to insure success. "Timing is everything"(Madsen & Madsen, 1998, p. 71).

Music teachers consider teaching skills and personal communication skills vital to the success of a new music teacher (Madsen, Standley, & Cassidy, 1989). Administrators actually have rated teaching skills as more important than musical skills, though music teachers considered personal development of their musicianship very important (Taebel, 1990). Students rated teachers as more effective when they used high intensity/high magnitude teaching and faster pacing (Single, 1990). Experienced teachers were found to spend more time in singing and less time in verbalizations than less experienced teachers. Master teachers modeling these effective teaching behaviors is an important part of training new and novice teachers (Wagner & Strul, 1979).

Cox (1989) classified rehearsal structures, and while successful directors showed preference for one of the three, none was strongly opposed to any of suggested rehearsal structures. The key element seemed to be that rehearsals should have structure regardless of which structure a director chooses. The pace of the rehearsal moved forward and maintained student attentiveness and enthusiasm.

We know that highly trained teachers use frequent alternation of activities and provide students with frequent opportunities to respond. The total duration of performance time seemed less crucial for effectiveness than frequent, short episodes (Siebenaler, 1997). Shorter episodes of teacher and students behaviors have been rated higher in several studies in which the higher rated examples showed high enthusiasm, eye contact, high approvals and overall intensity (Yarborough, 1998, 1999).

In gathering information from excerpts of lessons, time-sampling, a dependable research tool, has been used to draw conclusions. Many times these excerpts are scripted to provide the needed subject responses. It may be useful to have information gleaned from complete rehearsals conducted in a regular music classroom with no controls over what is being taught or how the teacher is presenting the lesson. These authentic class observations may add specific details to our knowledge of teacher and student behaviors. Since master teachers are a valuable source of information for new, novice, or teachers in need of prescriptive help, analyzing classes taught by master teachers could give new insight or clarification as to what effective teaching strategies they use.

The purpose of this study is to describe and compare behaviors of experienced teachers in their regular rehearsals using existing definitions and descriptions of good rehearsal pacing.

Need for the Study

The art or science of instructional pacing is one of the more difficult aspects of teacher training for new and novice teachers to ensure success in the classroom. Experienced teachers who have problems with structure and the flow of rehearsal activities require specific strategies they can incorporate into their own teaching style. Choral rehearsals by nature are very interactive and involve many teacher and student behaviors. How the rehearsal moves in time and how those behaviors are paced is crucial for successful musical growth and student learning.

Social skills and personality are important variables and certainly affect how a teacher moves through the lesson or rehearsal. Suggesting to a new teacher, who may be shy and soft-spoken, that the lesson is “slow” or that they “need to move the rehearsal along” maybe not helpful, and in fact can be frustrating. If the teacher knew how to pace faster, or move the rehearsal along, he or she surely would have already done so. Specific strategies used by experts that can be observed and put into effect in a music classroom offer prescriptive help instead of ineffective general suggestions, such as “faster!” How lessons move across time is affected by the personality of the teacher, but effective strategies that structure good pacing can be taught. Behaviors by experienced teachers that can be observed, identified, and described can be used as prescriptive behaviors for new, novice, or frustrated experienced teachers to improve their effectiveness.

The purpose of this study was to investigate instructional pacing by observing and recording five experienced teachers in rehearsal, to describe their rehearsal behaviors, and compare their usage of time to multiple descriptions of pacing drawn from existing literature.

Definitions for this Study

Behavior

Activity with a definitive beginning and ending that can be observed and measured. Duration of teacher and student behaviors measured in seconds.

Rehearsal segment

A group of behaviors in a structured rehearsal that signals a major shift in activity. Abbreviated as RS in tape analysis (see Appendix A).

Beginning Choir

The choir with the least experienced singers

Advanced Choir

The choir with the most experienced singers

Categories and Abbreviations of Behaviors Used

- 1o Teacher off-task, social talk
- 1a Teacher academic instruction or directions
- 1ar Behavior 1a given during a student response, either 2r or 2p
Referred to as “hustling” in Yarborough (1999) and Orman (2002)
- 1p Teacher modeling by either singing or playing the piano
- 2o Student off-task, social talk
- 2r Student response to 1a, verbal or non-verbal
- 2p Student performance, singing

- 3a Teacher approval to a specific student response
- 3d Teacher disapproval to a specific student response

Limitations of the Study

Subjects in this study were selected as examples of effective teachers whose classrooms provide a rich, positive learning environment. The stated purpose of the study, to describe how they use time in their rehearsals, did not include an attempt to rate the musical effectiveness of the rehearsal.

CHAPTER TWO

REVIEW OF LITERATURE

Pacing in music rehearsals and classrooms has been described and studied as an important element in effective teaching. How pacing is viewed has become more empirical as the role specific teacher behavior plays in effective teaching has been studied during the past twenty-five years. Literature published early or mid-twentieth century consisted primarily of non-empirical, expert opinions of what worked in a particular music classroom for a particular author. Conducting and music education books exhorted conductors and teachers to maintain interest of the students, keep the pace moving, and plan rehearsals to maximize use of time (Ehlert, 1951; Pfautsch, 1973). “Imbalance between singing and talking suppresses the possibility of a well-paced rehearsal,” (Pfautsch, 1973). Such subjective recommendations and general comments were not prescriptive and gave few measurable behaviors for beginning and/or experienced teachers to use in developing effective teaching strategies for the use of time. When behaviors happen is as important as what behaviors are happening (Madsen, 1998; Duke, Prickett, & Jellison, 1998). Murray (1980) suggested that teachers have not taken advantage of music education research to improve their own efficiency. Unless teachers are shown a more effective way,

they may tend to teach in the same way they were taught, resulting in a disparity between practice and intention (Madsen & Kuhn, 1985). Effective strategies are important because most classroom events don't just occur; they are a result of teacher behavior (Madsen, 1998).

Rehearsal/classroom pacing is one of many important aspects of effective teaching and it is useful to identify and describe different skills and strategies for training pre-service and in-service teachers. Knowledge of teaching strategies gained from studies involving music classes is relevant to general education studies of expert teaching behaviors (Berliner, 1986). The routines, patterns, and management techniques used by master teachers in music are a valuable source for all teachers (Standley & Madsen, 1991).

Teacher Behaviors and Skills

Music teachers consider continuous development of their personal musicianship to be a vital part of the effective teaching process (Buell, 1990). Inadequate musical knowledge cannot be overcome by good teaching skills, but many studies support the finding that teaching skills are equally as important as musical skills (Madsen, Standley, Cassidy, 1989; Teachout, 1997).

Preservice and experienced music teachers rate teaching skills equally as important as musical skills. Teachout (1997) investigated skills and behaviors that are important to successful music teaching in the first three years of teaching. Both the experienced teachers and new teachers recently completing

their undergraduate study agreed that personal skills and teaching skills were more important than musical skills in the initial success of a music teacher. Seven of their top ten responses were identical. Some of the items that were ranked high by both groups emphasized overall maturity, self-control, ability to motivate students, strong leadership skills, and a positive approach to teaching (Teachout, 1997).

In a study that analyzed the perceptions of new teachers, the most valuable part of undergraduate training was field experience and student teaching. Conway (2002) reported the novice teachers placed great importance on the applied study and ensemble classes in college, but found actual classroom experience the most valuable.

Single (1990) found that regardless of their musical abilities, students rated teachers higher when they used faster pacing and showed a high level of intensity. Yarbrough and Madsen (1998) reported that students who rated videotaped teaching excerpts gave positive comments for student attentiveness, enthusiasm, and pacing and overall teacher effectiveness. Students rated these excerpts higher even when one excerpt contained inaccurate musical information.

Taebel (1990) compared the teaching skills of general classroom and music teachers. Teachers, administrators, and music supervisors were surveyed using 10 competencies and 117 behaviors. Administrators rated music teachers lower in several observable-teaching skills than non-music classroom teachers, suggesting that administrators consider teaching skills more important than

musical skills. Music teachers generally rated themselves higher than trained observers using measurements also used in general classroom observations (Taebel, 1990). Other studies show that self evaluations tend to be higher than observation by others (Madsen, Standley, & Cassidy, 1989; Byo, 1990) These studies suggest the need for reliable measurements and procedures that take into account the specialized nature of the music classroom.

Wagner and Strul (1979) reported that there are strong similarities between new teachers, teaching interns, and their mentor teachers. If teachers do indeed learn from those people they observe, then master teacher behaviors should be studied and analyzed closely.

Using the Music Teaching Reinforcement-Activities Form (MTRA), a form introduced by Moore (1976), observations of elementary music teachers were made in order to quantify the use of classroom time. Forsythe (1977) and Moore (1974) found that teachers in elementary music classes were found to emphasize teaching, playing instruments, giving directions, singing, and listening activities. Using a modified form based on Moore's MTRA (1976), Wagner and Strul (1979) showed that in these studies teaching was the primary activity. The only significant difference shown by Pre-Interns, Interns, and Experienced teachers, was in getting ready and transition activities. Experienced teachers spent significantly less time giving directions (preparation) than Pre-Interns or Interns. Lack of significant differences in time spent in other classroom activities, types of reinforcers used, and resulting student attitudes support the continued investigation of how master teachers structure rehearsal and/or teaching time.

There is growing support for the idea that observing experienced teacher behaviors appears to be an important part of developing effective teaching strategies (Moore & Bonney, 1987; Schmidt & Hicken, 1986).

Standley and Madsen (1991) used videotapes to demonstrate tasks that differentiated musical skills and music teaching skills in master teachers. The number of years taught was not a significant variable, but the study showed teaching skills that clearly demonstrated teaching expertise. Thus, identifying master teachers would likely assist those involved in teacher training with efforts to place music education students in observation programs. Educators with expertise in teacher training consider the internship and supervising teacher to be vital to the preparation of novice teachers, demonstrating further need to identify master teachers, those skilled in both music and music teaching, for use in training pre-service and novice music teachers (Wagner & Struh, 1979).

In addition to music classroom settings, master teachers have been studied in rehearsal settings as well. The teaching skills and behaviors of conductors of ten large community choruses were studied. The results showed that adult singers rated the conductor's personal behaviors of greater importance than musical or technical skills. Behaviors ranked highest included: gives clear and easy-to-understand directions, shows enthusiasm, and instills confidence in the singers. Music-specific behaviors were considered important, but not ranked as highly as the personal behaviors (Bell, 2000).

Findings in one recent study underscored the impact of teacher delivery when students responded positively to lessons with good teacher-delivery over

poor delivery, regardless of the lesson content. Students both liked and found more interesting, those lessons with good delivery and poor content over lessons with poor delivery but good content (Hamann, 2000). Evidently, teachers who provide an enjoyable learning environment likely will have more positive student attitudes and higher enrollments in their classes (Sanders & Browne, 1998) This reinforces earlier findings that report teaching skills are considered as important as musical skills when measuring effective teaching (Yarbrough, 1975; Taebel, 1990; Teachout, 1997).

Personal Communication Skills

One teacher behavior regarded as important for classroom success is managing great amounts of personal communication effectively. General education experts have stated that a classroom teacher may engage in over a thousand interpersonal exchanges with students in one day. An early study showed an average of 80 individual interchanges with students per hour (Good, 1973). These exchanges are one part of the complex classroom environment a teacher must control in order for learning to occur. Another study suggested that effective instruction can only occur when teachers are able to make multiple, "on-the-spot" adjustments while teaching (Duffy, 1989). Duke (1987) reported that despite the hours all music professionals spend as students and teachers, putting into practice effective instruction and feedback strategies remains a difficult task.

Findings from an assessment tool developed by the state of Alabama to measure teacher effectiveness indicated that music teachers greatly outperformed general classroom teachers in eliciting performance responses from students (Taebel, 1990). Maintaining a pleasant manner while dealing with the demands of these many interchanges and adjustments is an additional challenge and requires adequate social skills (Sanders & Browne, 1998).

Personal communication, which has been shown to contribute significantly to teacher effectiveness, is directly affected by social skills (Hamann, 1998). A study of advanced music students revealed that their first music teachers were caring and friendly, and that these traits encouraged them to continue music study (Davidson, Sloboda, & Howe, 1998). The ability to get along with people is an essential social skill and is important in developing teaching effectiveness. Skill in communication has been identified as an effective predictor of teaching effectiveness for pre-service teachers, and the ability to communicate non-verbally with students in the music setting was shown to improve teaching effectiveness (Hamann, 1998).

Madsen, Standley, and Cassidy (1989) reported that two variables surface repeatedly in investigations of effective teaching strategies: enthusiasm and a sense of timing. They state that both of these variables require the individual to be socially aware or to "see oneself as others do" (Madsen et al. 1989, p. 92). Students readily identify these traits, which further points toward the importance of an enthusiastic approach towards music teaching (Cox, 1989).

Effective teaching is not the result of a single factor, but rather involves the establishment of a positive learning environment and the combination of effective teaching strategies. Recognizing individual differences in students, always an important factor, becomes even more vital in the music classroom where the opportunity for teacher-student exchange is even greater than in the general classroom (Taebel, 1990).

Student Attentiveness

Academic learning cannot take place unless students have the social skills to attend to, or concentrate on, the task. This premise is foundational to several studies designed to observe attending behaviors in the music classroom and how those behaviors relate to the activity. Classroom activities requiring active participation showed more on-task student behaviors, while students showed the greatest off-task behaviors during transitions, “getting ready” activities (Forsythe, 1977). Thus, effective teachers plan lessons that promote active participation in classroom activities, which results in more on-task involvement of the students. Another study showed that music is highly reinforcing to elementary children, and on-task behaviors were at the highest during singing and playing instruments. Experienced teachers spent less time in giving directions and more time in music activities than novice or pre-service teachers, and elementary students were happy to be in the music classroom, enjoyed participating, and spent some out of school time in music activities (Wagner & Strul, 1979).

Preservice teachers have been compared to experienced teachers in their use of time, and student attentiveness was higher in classes taught by experienced teachers (Moore & Bonney, 1987). Forsythe (1977) found that, rather than the total amount of time spent in the activity, the nature of the activity was the determining factor in producing on-task behaviors. Kostka (1984) in a study of private piano students, found that most off-task behaviors occurred during non-music activities and teacher instructions.

Bowles (1998) found that playing instruments was the highest rated musical activity for elementary students, even when a "less desired" activity, such as reading notation, was required to achieve this musical objective. Pairing activities that produce more on-task behaviors with more tedious musical tasks can increase overall student on-task behaviors. University band students showed greater attentiveness and reported a more positive attitude when performing during rehearsals. They preferred limited rehearsal time spent not playing, even when performing pieces they ranked lowest in preference (Spradling, 1980).

Academic learning suffers when there is more than 20% off-task in a classroom (Madsen & Madsen, 1998). An early study of teacher magnitude by Yarbrough (1975) suggested that teacher behaviors affect student performance, attitude, and attentiveness. Yarbrough & Price (1981) reported a strong relationship between off task behaviors and time spent in nonperformance activities. The teacher who demonstrated the least eye contact and the teacher who spent the most time in nonperformance activities produced the most off-task behaviors. It was also noted that more disapprovals than approvals were given

during nonperformance time, and this may be a variable in eliciting off-task behaviors. In several studies, students received their lowest performance ratings under low magnitude conditions and had the highest percentage of on-task behaviors during high magnitude conditions (Yarbrough, 1975; Yarbrough & Price, 1981). In a study of band and orchestras, off-task behavior was noted particularly during lengthy teacher talk and transition times (Witt, 1986). Study of teacher behaviors used to maximize student attentiveness has provided encouraging findings that contribute to the growing knowledge base of effective teaching.

Teacher and Student Interaction

High and Low Magnitude

One early study showed that students prefer a teacher demonstrating "high magnitude". Results indicated that teacher magnitude had little effect on actual performance of the students as reported, but student attitude was significantly affected (Yarbrough, 1975). From this study came an operational definition of high and low magnitude. A high magnitude teacher is one who maintains eye contact, frequently walks or leans towards group, exhibits a great variety of movement, shows sharp facial contrasts between approval/disapproval, and maintains a rehearsal pace that is rapid and exciting. In contrast, a teacher demonstrating low magnitude seldom looks at individuals in the group, stands behind a music stand at all times, reflects little enthusiasm/vitality in their speaking voice, uses a strict conducting pattern with no variation, maintains a

neutral mask- no frowns or smiles, and is slow and methodical. Byo (1990) employed “Rapid and exciting” and “Slow and methodical” as definitions of high and low magnitude.

In addition to high magnitude teaching, the use of feedback was shown to affect student attitudes. Significant differences were found in approval and disapproval ratios in high school choral rehearsals. In rehearsals with 80% or higher approval conditions, students’ attitude ratings reported by Murray (1975) were much higher than under disapproving conditions. Students were more attentive to approving conductors in the study of high and low magnitude (Yarbrough, 1975). In Madsen and Alley (1979), high approvals and reinforcement techniques had a positive affect on student learning. Reinforcement resulted in positive student attitudes in a study that controlled task presentation and reinforcement. Students maintained gains made in performance, even when new concepts were presented, and showed high attentiveness (Dunn, 1995).

Direct Instruction Model

Sequential patterns. A direct instruction model, initially shown to be effective in teaching remedial English and mathematics, was found to be applicable in music settings (Yarbrough & Price, 1981). Price (1983) investigated the effect of direct instruction for effect on musical achievement, attentiveness, and attitude during music ensemble rehearsals. This three-step model includes: 1-academic task (stimulus) presented, 2-student performance (response), 3-

feedback (following stimulus or another preceding stimulus). The complete cycle of 1- 2- 3 produced good musical performance and maintained the highest student attitude ratings. Appropriate feedback was singled out as an important factor in this study (Price, 1983) and active student participation demonstrated high student attentiveness and on-task behaviors.

Duke & Blackman (1990) investigated the effects of hierarchical and non-hierarchical task sequences on students' attitudes and retention of performance skills. No differences were shown in skill retention, but students regarded the lessons structured in hierarchical task sequences to be less frustrating and more enjoyable than the non-hierarchical.

The variable of pacing was added to a study investigating teaching cycles (Yarbrough, 1987). Experienced teachers of general music, choir, band, and orchestra were used as subjects, as well as recorded rehearsal excerpts conducted by Bruno Walter. The three components of a complete teaching cycle were coded and defined. As a means of exploring pacing, a rhythmic "bit" defined each response. This gave a rhythm to the teaching cycles that allowed a visual look at the data collected. Band directors spent more time in incorrect cycles, supporting previous findings that many band directors may use little feedback. A large percentage of time was spent giving directions and very little time was spent providing feedback. While experienced high school band directors were highly disapproving when giving feedback, the elementary vocal teachers and the choral directors were highly approving. Disapprovals were more specific than approvals for all groups (Yarbrough, 1987). This finding seems important in light

of the report that students have been shown to be more attentive and show more positive attitudes towards approving than disapproving teachers (Kuhn, 1975; Yarbrough, 1975).

Yarbrough & Price (1989) observed teachers to determine how task time was spent and whether the sequence of teacher task presentation, student response, and feedback was appropriately followed. The subjects included experienced band and choral directors, trained sophomore music education majors, and freshman music education majors. Correct cycles included a "1, 2, and 3". Time spent in correct and incorrect teaching cycles was calculated in seconds, and results showed a greater percentage of time spent in incorrect teaching cycles (all three components not used) in all groups, except the freshmen. Comparatively, little time was spent on reinforcement and almost half of the rehearsal time was spent in student performance. This "structured practice" followed a pattern of the teacher stopping the students to give directions without any musical information.

The use of complete teaching cycles, also called sequential patterns, may increase teacher effectiveness ratings (Yarbrough & Hendel, 1993). Music lessons taught by elementary education majors were studied to see if sequential patterns increased effectiveness in music teaching. The experimental group spent more time in student response and decreased the amount of time spent in task presentation. Though inconclusive regarding overall music teaching effectiveness, the use of time in 1) teacher presentation, 2) student involvement,

and 3) teacher feedback seemed to structure more effective teaching during complete teaching cycles (Bowers, 1997).

Intending to provide guidance to teachers in structuring a proactive learning environment, Duke developed a form to assist in the observation of timing and sequencing of learning events. The Instructional Sequence Observation Form enables researchers to see if teachers are able to select and structure learning sequences in a proactive manner. Teachers not skilled at controlling the learning structure react to students' behaviors, while proactive teachers can structure learning to elicit a high probability of correct responses and approval by the teacher. A structured, proactive learning environment makes a positive classroom experience possible for students and teachers (Duke & Madsen, 1991).

Appropriate sequencing of music instruction has been suggested as a useful tool for music teachers. Recommendations that teacher-training programs seek ways to teach the use of sequential patterns using rhythmic "bits" has been recommended as a useful tool for teaching the concept of pacing (Yarbrough, 1988).

Feedback. Duke (1987) reported that experienced music teachers, despite the many hours spent as students, teachers, and observers, have trouble using appropriate feedback. In two studies (Duke, 1987; Yarbrough & Price, 1989) all groups of teachers studied gave more specific disapprovals than approvals and the experienced teachers were highly disapproving. The band directors' ratio of disapproval to approval was 81/19 and choral directors' ratio

was 59/41. These experienced teachers were quick to catch students' mistakes, but gave little musical information. Less than 20% of these presentations were spent in giving musical information, suggesting that many teachers are simply engaging in error detection and not actual feedback. The trained sophomores group was the only one that spent more time giving instruction and specific feedback.

Instruction during four 50-minute sessions prepared undergraduate education and music education majors to increase their use of general and descriptive reinforcements (Jellison & Wolfe, 1987). Undergraduates were shown to significantly increase their use of a complete teaching sequence and specific approvals when using feedback from the instructor and videotaped self-observation. The concept of complete teaching cycles was further refined to require that the task include musical (academic) information and feedback be specific and related to that task (Price, 1982). Students involved in the video self-observation portion of this investigation became more independent in self-assessment, rather than relying completely on instructor feedback.

Non-musicians (n=514) also were used to replicate findings in an earlier study demonstrating preferred feedback using the direct instructional model. The data from non-musicians was compared with the data from the groups of musicians. Both agreed that the preferred sequential pattern of music instruction is when the teacher presents a musical task, students respond, and the teacher gives approval feedback that is specific and related to the task presented (Price, 1992).

Nonmusic students in college demonstrated a preference for sequential patterns that included approval feedback. Although the lowest rated patterns were those with nonspecific disapprovals, higher ratings were given disapprovals that were specific and provided corrective information. How specific disapprovals affect student attitudes may be dependent on the age and level of sophistication of the student (Price & Yarbrough, 1994).

Two methods of giving corrective feedback in music performance classes were compared: the use of negative feedback statements and specific directives. There was no measurable difference between the two conditions, demonstrating that when students have frequent opportunities to respond, the precise language of the teacher's correction is not significant (Duke & Henninger, 1998). Previous research has shown that students involved in music activities are often reinforced by the music activities themselves, and do not always need reinforcement to maintain attention and appropriate behavior (Forsythe, 1975; Forsythe, 1977; Kostka, 1984; & Madsen & Duke, 1985).

Teachers trained in task analysis were compared to untrained teachers to differentiate the specific and general feedback statements given by teachers. There was no difference in the feedback given, but when teachers were trained in task analysis the students spent more time in performance (Maclin, 1993). Teacher feedback also may function differently in the music classroom than in the general classroom due to the more frequent opportunity for student response. In addition, expert music teachers tend to give feedback at a higher rate than non-experts. The higher rate is not a result of feedback following every student

response; rather the experts tend to give feedback following less than 30% of student response (Duke & Henninger, 2002).

Madsen & Duke (1985) determined that music education and music therapy students' perceived approval and disapproval feedback within music classrooms differently. After viewing a videotape and describing teacher and student behaviors, observers inaccurately estimated percentage of class time spent in approval or disapproval feedback. Perceptions of feedback may be dependent upon the experience and goals of the observer and may not function as the teacher intends (Madsen & Duke, 1985).

Pre-service teachers were observed to see if their ability to give appropriate feedback supported earlier findings. Negative feedback for inappropriate behaviors was given more frequently than positive feedback for appropriate behaviors and subjects had difficulty differentiating between observable behaviors (Duke, 1986). Since student attitudes towards music are affected by both positive and negative verbalizations, this is an important skill for music teachers (Dorow, 1977; Forsythe, 1975).

Higher negative feedback by experienced teachers was reported in the final stages of rehearsal before a superior performance (Davis, 1998), suggesting that students in performance classes may receive more negative than positive feedback and still maintain high attentiveness. Older students with more musical sophistication may frequently interpret non-verbal and facial communication from the teacher, which along with their own accomplishments or failures can function

as positive or negative feedback and maintain positive attitudes and their self-efficacy (Yarbrough & Price 1981, 1989).

Interactions in the music classroom are complex and the effect of feedback should be viewed as it relates to the entire music classroom environment (Duke & Henninger, 1998). Madsen & Alley (1979) reported negative feedback in studies might be directed to students' social behaviors rather than academic (performance) behaviors. Expert teachers do use frequent negative feedback statements, directed to students' performance skills. Those teachers use both positive and negative feedback at a high rate. Students in music classrooms are frequently given opportunities to improve their performance through repetition. This creates the opportunity for students to provide their own positive feedback from their own performance (Duke & Henninger, 2002).

Teacher Intensity

Intensity is defined as "sustained control of the student/teacher interaction with efficient, accurate presentation and correction of the subject matter combined with enthusiastic affect and pacing" (Madsen, Standley et al. 1989). Maintaining student attention and active involvement in the learning process is an important goal for teacher effectiveness. Yarbrough (1975) concluded that students preferred "high magnitude" teacher behaviors that included eye contact, closeness to students, varied vocalization, gestures, facial expressions, and fast pacing. Intensity and magnitude were used interchangeably in early studies of

teacher behaviors. Academic presentation and reinforcement were added to the definitions of magnitude in later investigations of teacher intensity (Yarbrough & Price, 1981; Madsen, Standley et al. 1989).

Identifying intensity is an important first step in determining if intensity can be taught and learned. Untrained subjects were observed to determine if they could identify high and low contrasts in teacher intensity. Results showed that high and low contrasts could be quickly taught to and demonstrated by pre-service music teachers (Madsen, Standley et al. 1989). Experimental study 1 showed that intensity in speaking about oneself did not correlate highly to intensity in a teaching a musical task. Experiment 2 investigated teacher intensity of three groups of students engaged in a teaching task. Rated on intensity, the untrained freshmen teachers rated significantly lower than the music education and music therapy seniors in demonstrating intensity. Regardless of training, all observation groups could reliably identify high and low teaching intensity. This suggests that as a teaching skill, intensity can be taught and measured (Madsen, Standley et al. 1989). The final step of this investigation showed that expert music teachers reliably judged intensity of student teachers.

Modeling contrasts of negative and positive examples has been shown to be an effective strategy for teaching intensity (Byo, 1989). Undergraduate beginning conductors showed contrasts between high and low teacher intensity, and trained and untrained observers could readily identify these contrasts. A large sampling (n=320) was employed and results demonstrated that reliable observations concerning intensity could be made regardless of musical

experience or age. Though the use of high and low intensity contrasts made it easier for the untrained observers to identify the level of intensity, it is important to note that the overall ratings for all observers were highly reliable (Byo, 1990). The intensity self-ratings of the conductors in this study were significantly higher than ratings from the experimental group observers, which support previous research on comparing self-ratings to independent observers (Yarbrough, 1987).

Use of Time in the Classroom

The use of time and how it is structured surfaces in all studies of intensity, teacher magnitude, and teaching effectiveness. Thurman (1977) reported 40% of rehearsal time spent in verbal communication. Orman (2002) supports those findings in an observation of elementary music teachers. Over 46% of the class was spent in teacher talking. An investigation of conceptual teaching showed 37% of music classroom time was spent giving verbal directions and only 9% in any type of feedback (Blocher, Greenwood, & Shellahamer, 1994). Observers have reported that elementary music classroom teachers use the majority of their time in teaching activities (Forsythe, 1977; Wagner & Strul, 1979), while secondary instrumental and choral ensembles use most of their rehearsal time in performance activities (Caldwell, 1980; Witt, 1986). Studies of band directors found frequent sarcastic and punishing disapprovals used (Yarbrough & Price, 1981, 1989) while expert junior high choral directors demonstrated a “business-like” image, thorough preparation for rehearsal, and spent most of the rehearsal in performance activities (Fiocca, 1989).

Inexperienced teachers gave directions significantly more than experienced teachers in an investigation that sought to identify the use of time and ways of improving teachers' use of time (Wagner & Strul, 1979). Time spent in "getting ready" was shown to produce more off-task behaviors (Forsythe, 1977). Brendell (1996) examined how choral directors use the first minutes (time before literature rehearsal begins) of class. Off-task behaviors were considerably higher during vocal and physical warm-ups than when sight-reading. This suggests that students were more on-task during classroom activities that require active participation (Brendell, 1996). Structure of classroom time and specific ways of improving the pace of a lesson or rehearsal is one important factor in overall teacher effectiveness. Better understanding of the importance of time for study and practice is prescriptive for all music educators (Jellison, 2000).

Kostka (1984) observed that in private piano lessons the lesson time was largely divided between student performance and teacher instruction, with frequent feedback and high student attentiveness. Teacher instruction time was over 40%. Moore (1976) reported general music classroom teachers spent 22%-26% in instruction time and 53% of class in non-music making activities. Since the amount of time spent in actual performance has been shown to strongly correlate to on-task behaviors (Yarbrough and Price, 1981), it is no surprise that experienced teachers spend less time giving directions than pre-service teachers or teaching interns and their students have more performance time (Wagner & Strul, 1979). These findings become important in light of the correlation between student achievement and student attentiveness.

Videotapes were made of choral rehearsals and analyzed using Bloom's (1956) taxonomy of educational objectives, and Ausubel's (1963) subsumption theory to identify critical thinking strategies. Students in advanced choirs from thirty-two schools were used as subjects. School populations varied from 500-3500 representing small to large cities, and the choral directors' teaching experience ranged from 1-32 years. Three categories of nonperformance were observed: A-Nonperformance activity eliciting lower order thinking, B-Nonperformance activity eliciting higher order thinking, and O-Nonspecific nonperformance activity and silence. Results from this study showed overall time spent in nonperformance was 38.60%. Of this percentage, 90% of the nonperformance time was spent in condition A. Condition B, which involved higher order thinking, only accounted for 1.3% of the nonperformance time. Only two teachers in this study consistently used higher order thinking strategies in their teaching (Watkins, 1996).

A related study investigated middle school and high school band directors in Florida. Seven specific teacher behaviors were observed: Nonmusical, nonverbal instruction, verbal instruction, non-interactive listening, nonverbal feedback, verbal feedback and conceptual teaching. Less than 3% of the observed behaviors involved conceptual teaching (Blocher, Greenwood, & Shellahamer, 1994). Davis (1993) found one of two experienced directors studied elicited a high rate of critical thinking during verbalizations. Evidently, teachers tend to use time in rehearsal situations to direct the learning process rather than encourage students to use critical thinking and decision-making processes.

Three groups of teachers (experienced, novice, and student teachers) were compared in twenty rehearsals on how they used time. Verbal behaviors were more frequent for novice and student teachers, while experienced teachers had a higher percentage of time spent in performance activities and used nonverbal modeling more than other teachers (Goolsby, 1996). Expert teachers made frequent stops for shorter durations than the other two groups. During that time, the expert teachers gave more performance instructions but maintained a higher rate and percentage of performance to verbal behaviors (Goolsby, 1996, 1997).

Music teachers show a high percentage of verbalizations (Forsythe, 1979; Wagner & Strul, 1979; Moore, 1987). Orman (2002) reported that while 46% of music classroom time involved teacher verbalizations, the teacher played an active role in over 70% of the class time either talking or modeling. Over 57% of the students' time was spent in a passive way, listening to the teacher. Orman suggests that as teachers tend to have inaccurate perceptions regarding their use of time, the active teacher role may give the impression of student activity (Orman, 2002).

Descriptions of Pacing

Timing Characteristics

It is difficult to assert one definitive description of what constitutes good pacing, or even what pacing actually encompasses. Authors agree that it deals with time and activities, and that effective teachers know how to use it. Pacing

has been defined as the act of moving through each activity in a rehearsal plan, in addition to the transition periods between activities (Small, 1979). A rapid pace increases student attention, student achievement, and overall teacher effectiveness (Yarbrough, 1975; Price, 1983; Duke, Prickett et al. 1998). Petty (1987) defined pacing as the durational involvement and flow of activities in a lesson or rehearsal plan.

Single (1990) described components of pacing, explored a way of measuring pacing in an instrumental rehearsal, and determined if the perceived rates of pacing agreed with the data recorded. Rehearsals of junior and senior high school bands were recorded and viewed by trained observers. Activities were categorized, timed, and the rate of speech measured. Teachers were rated as to instructional pacing (very slow to very fast), level of intensity, and rate of speech. Observers also made subjective remarks about the perceived pacing of the teachers. In the junior and senior high classrooms, the highest percentage of the rehearsal time was spent in performance activities and there were high correlations between intensity and pacing, between intensity and rate of speech and between pacing and rate of speech. There were no significant relationships between recorded measures of pacing and the observers' perceptions of instructional pace. The highest rated teachers demonstrated similar use of rehearsal time (Single, 1990).

Cox (1986) observed two choral directors, one experienced high school director and one experienced university director. The purpose was to investigate the use of rehearsal time as they prepared for upcoming performances and to

record director approvals, disapprovals, and other comments. In the 14 rehearsals before the performance, the high school director used more non-performance time while the university director in the final 15 rehearsals increased performance time. The director approvals increased with the high school director and decreased with the university director, who used more disapproval throughout the study. The data suggested that one director used a "dress rehearsal" method of time use while the other used more encouraging remarks to prepare the choir for performance. Choices may be situational, based on a variety of factors (Cox, 1986).

Two high school directors were videotaped during eighty-three rehearsals and four final performances to identify rehearsal behaviors and evaluate student achievement (Davis, 1998). Observations were made of teacher instructions, student response, teacher feedback, and also frequencies of teaching sequences. Each director was recorded in rehearsal with a beginning and advanced choir to examine whether the instructional pace was related to the maturity of the choir. Results showed that both directors reflected the same rehearsal structure and pacing with both their beginning and advanced choirs. Time spent in teacher verbalizations did not correlate with performance success, as one director showed significantly more verbalizations, but both directors brought their choirs to a "superior" performance. Teacher assistance and instructions decreased for both directors as student performance improved and concert time neared.

Rehearsal pacing was studied among a group of secondary string teachers. The pacing definition used in this study was the number of consecutive observation units per variable. The teachers' pacing was consistent and did not vary significantly during their rehearsals or across time (from fall to spring rehearsals). This study determined that pacing is an important variable and merits further definition and research (Erwin, 1992).

Cox Rehearsal Structures

Rehearsal structures by outstanding Ohio directors were studied by James Cox (1989) to determine preference by directors and students. Sixty high school choral directors participated in the study. Responses were obtained from directors, students, and administrators regarding attitudes and perceptions of rehearsal structure and characteristics of the director.

Rehearsal structure A. Structure A organized the rehearsal by placing faster-paced activities, such as singing through a familiar song, at both the beginning and ending of a rehearsal (Garretson, 1971). Slower-paced work on music, either new or in developmental stages, occurred in the middle portion of the rehearsal.

Rehearsal structure B. Structure B is a derivative of the rule of Golden Proportion in which the rehearsal begins and ends with faster-paced activities, but the middle portion of slower-paced study reaches a point of high intensity two-thirds of the way into the rehearsal. This requires a steady and controlled directional flow of activity and rehearsal climax should be followed by a relaxation

of intensity that builds back to the final minutes of rehearsal. This analytical structure is applicable in areas outside of music, such as architecture, but was put forth as a music rehearsal structure by Pascoe (1973).

Rehearsal structure C. The third rehearsal structure (C) alternates familiar music with new music, and easy with difficult compositions. This structure is recommended in early music education books (Decker & Herford, 1973) and suggests frequent changes of pace within the rehearsal structure.

Preference of rehearsal structures. Questionnaires were administered to directors, students, and administrators in a follow-up study to determine rehearsal structure preference. After a pilot study was completed, these questionnaires were sent to experienced choral directors who had participated in state-level festivals at least twice. They were asked to choose their preferred rehearsal structure from the three described in the previous paragraph. Structure A was preferred by 55%, 22% preferred structure B and 15% chose structure C. Directors indicated that despite their choices, they had no strong feelings against the other rehearsal structures and they also valued the use of a closure activity, which supports several previous studies (Garretson, 1966; Decker & Herford, 1973; Cox, 1989).

Students' perceptions of directors indicated that directors choosing structure A were perceived as more enthusiastic and less patient. Directors who chose structure B were perceived as the most patient. The directors in this study had much in common, and regardless of their preferred rehearsal structure showed that enthusiasm for both music and teaching were the most important

elements in their success. The important factor, according to the discussion in this study, was that the directors did structure the rehearsal, not which structure they preferred (Cox, 1989).

As defined in the literature, pacing analysis can encompass the overall rehearsal structure, as shown by Cox (1989), or can describe the mean rate of teacher and student behaviors, or reflect the duration of behaviors or activities. All of these variables have been studied in different settings to expand our knowledge of how effective teachers use time.

Alternation of activities

Frequency. Music rehearsals and music classes involve the ongoing alternation between teacher instruction and student activity. Pacing definitions acknowledge all students must frequently participate actively in music classes. Musical sophistication and age are also determining factors in how the teacher plans this alternation in the lesson or rehearsal. Younger students need more rapid movement from activity to activity while older, more sophisticated, music students may prefer more opportunity for extended work (Smith, 2000). Students at all levels of musical sophistication need frequent performance opportunities in order to demonstrate their expertise. The importance of frequent interactions between teachers and students is included in most definitions of pacing (Duke, Prickett et al., 1998).

It has been observed that highly skilled piano teachers demonstrate rapid alternations between teacher activity and student activity. However, students of

these teachers did not necessarily perform for a longer time in the lesson than students of less skilled teachers. The timing difference was in the mean duration of each activity period and the rate of alternation, not in total performance time (Siebenaler 1997; Duke, Prickett et al. 1998).

A comparison of excerpts demonstrated timing characteristics and mean episode duration as a crucial factor (Goolsby, 1996, 1997; Moore & Bonney, 1987; Yarbrough, 1988). Subjects rated faster paced examples consistently higher than slower paced examples, and maintained high agreement on all faster/slower examples. Novice teachers differentiated between fast and slow pacing with high reliability. Shorter durations in the higher rated excerpts supports previous studies of excellent private teachers (Siebenaler, 1997; Kostka, 1984). Variables measured in the faster profile were teacher talk, teacher demonstration, full-group student activity, and music performance. Higher rated excerpts contained higher rates of directives and feedback and lower rates of information statements and questions (Duke, Prickett et al. 1998).

Perceptions of pacing. Perceived pace of instruction is proportional to the rate of student performance opportunities rather than the overall class time spent in student activity. Effective pacing can be defined as frequent, generally short performance episodes, and brief episodes of teacher activity. Shorter durations provide teachers the opportunity to provide more feedback and reinforcement. Variances in teachers' performances (better and worse teaching) can be recorded and provide novice, pre-service, and experienced teachers with the

best possible model for improving teaching quality; their own best teaching can be the model for improvement (Duke, Prickett et al. 1998).

Observers' perceptions of pacing in music instruction were further assessed to identify the aspects of timing that are associated with evaluations of instructional pacing. Previous studies used observations to gain insight into specific teacher and student behaviors (Madsen & Yarbrough, 1980; Duke & Madsen, 1991) timing behaviors (Yarbrough & Price, 1981, 1989; Jellison & Wolfe, 1987) and behaviors affecting overall teacher effectiveness (Byo, 1990; Madsen & Geringer, 1989; Cassidy, 1990). Duke (1998) extensively studied and described this complex area and attempted to empirically analyze and describe pacing in music teaching. Observers were assessed for their ability to reliably differentiate between slower and faster paced teaching excerpts. Timing variables in the instructional interactions were also studied (Duke, Prickett et al. 1998).

A variety of music settings were used to identify differences in pacing: a choral rehearsal, a band rehearsal, and two elementary music classrooms. Each teacher appeared in two excerpts that demonstrated different pacing, but all examples contained what the researchers considered good teaching. A timing profile was developed and several means of measurement were used including time-sampling, counting the frequencies of occurrence of a given behavior, and mean episode duration of a given behavior. Proportions of time, shown as percentages, were used rather than total time. Novice teachers (n=44) in upper-level music education programs were used as observers. Subjects were directed

to evaluate the pace of instruction, not the overall teaching quality. Excerpts with high frequencies of activities and shorter mean durations were rated more positively (Duke, Prickett, et al. 1998).

Direct Instruction. Sequential patterns (Yarbrough & Price, 1981, 1989; Bowers, 1997) were used to examine verbal and non-verbal teacher behaviors (Davis, 1993) and student behaviors in a longitudinal study. Time measured in seconds and frequency of occurrence were calculated for many variables, including the measurement of pacing as change in focus of activity from teacher to student. Two rehearsals that demonstrated the highest and lowest performance ratings were analyzed. The highest rated rehearsal recorded an average teacher/student activity length of 10.94 seconds and 34.26 seconds. The rehearsal with lengths of 30.09 seconds and 39.60 seconds was rated lowest. When compared to the faster paced rehearsal, the slower paced rehearsal had the lowest performance rating, more off-task, less time in performance, less disapproval, less teaching time during performance, and fewer complete sequential patterns (Yarbrough, 1997).

It has been speculated that difficulty of the literature (familiar, easy, or difficult literature) may cause the perception of the pacing in rehearsals to be different. If the literature is more difficult, resulting in more tedious drill and repetition, the pacing may be perceived as slower (Yarbrough, 1997).

Excerpts of rehearsals demonstrated identifiable teaching skills: time use, musicianship, accuracy of presentation, student attentiveness, student performance, student performance quality, enthusiasm, intensity, pacing,

personality, and overall effectiveness (Madsen, Standley et al. 1989). University music majors (n=89) rated these skills on a 1 to 10 scale. Analysis revealed significant relationships within the pacing, enthusiasm, and intensity categories. Longer excerpts received lower ratings for performance, quality, enthusiasm, personality, and intensity, and subjects rated the pacing as slow (Yarbrough and Madsen, 1998).

One correlation found was the relationship between intensity and enthusiasm, supporting Yarbrough's early research in which the terms were used interchangeably (Yarbrough & Madsen, 1998; Yarbrough, 1975). The third highest rated excerpt contained inaccuracies in the presentation. This supports an early study commonly known as the Dr. Fox Study. An actor was hired to give a lecture to university students. His delivery was high intensity and the content was meaningless. Students gave the "teacher" high approval ratings, showing that students may prefer high intensity teachers even when they present meaningless or incorrect information (Naftulin, Ware, & Donnelly, 1973).

Price & Yarbrough (1994) replicated earlier studies to demonstrate that music students and teachers prefer a pattern of instruction that involves sequential patterns (1-2-3) and rated highest patterns that included task presentation, student response, and approval feedback. Patterns that contained disapproval feedback were rated lower than teaching cycles with no feedback. Disapprovals that were nonspecific were rated significantly lower than specific disapprovals, while there was little difference in ratings of specific and nonspecific approvals. Thus, disapprovals need to be specific to be corrective

and function as feedback. This study indicated that students' age and musical sophistication could affect how students rate disapproval feedback.

The focus of the observation may affect how the excerpt is rated. Subjects gave their highest ratings while viewing the teacher and lowest ratings when viewing the students. Evaluations changed when the observation focus changed (Duke & Prickett, 1987). This would suggest that future research using observations of teachers and students attempt to use observations of both, either with two cameras or a split screen.

Need for the Study

Three components of effective teaching remain difficult to teach novice and in-service teachers: student attentiveness, positive reinforcement (feedback), and pacing (Yarbrough, 1999). Pacing is clearly more than just how much time is spent in a particular activity. Attempts at an empirical definition of pacing have involved changes in activities (Yarbrough, 1975; Yarbrough, 1988), mean duration of activities (Duke, et al., 1998), and the overall rehearsal structure (Cox, 1989). Positive evaluations of pacing have consistently shown that each of these only partially defines the complexity of pacing and each of these models may either completely or partially support the others (Yarbrough, 1988; Yarbrough & Madsen, 1998).

The Direct Instruction (sequential patterns) model has been shown to affect attentiveness, attitude, and achievement. Use of complete teaching cycles

with specific feedback has been highly rated (Price, 1993; Bowers, 1997). Incorporating this model into a descriptive study of pacing is logical and necessary, as effective teaching is the ultimate goal.

Existing research has shown the importance of fast pacing for effective teaching. It is also clear that appropriate pacing is dependent upon teacher goals and achievement expectations. Observations of teacher behaviors across time have involved time sampling that extrapolates information from excerpts of rehearsals, or scripted rehearsals (Forsythe, 1977; Wagner & Strul, 1979; Price, 1983; Price, 1992; Duke et al., 1998). Observing, recording, and analyzing choral rehearsals taught by teachers in “real life” rehearsals, using empirical approaches from literature, may give further insight into rehearsal pacing.

An overlay of pacing descriptions on observed teacher and student behaviors in a complete and unscripted rehearsal can give new, novice, and experienced teachers practical and prescriptive information concerning the nebulous and multi-faceted art of pacing.

CHAPTER THREE

METHODOLOGY

Preliminary inquiries explored the effective teaching literature for findings that would clarify pacing. Models that identified key elements of effective pacing showed overlap in several areas. Existing literature contained multiple approaches to rehearsal pacing and the use of classroom time, but did not clarify what common results might be obtained from looking at the different approaches together. Many previous studies also used excerpts of rehearsals or time-sampling and did not use complete rehearsals in descriptions of pace.

The purpose of this study was to investigate instructional pacing by observing and recording five experienced teachers in complete rehearsals, to describe their rehearsal behaviors, and compare their usage of time to multiple models or descriptions of pacing drawn from existing literature.

Subjects

Subjects for the study were five experienced teachers selected from the American Choral Directors Association (ACDA) and Music Educators' National Conference (MENC) who met the following criteria:

- 1) Five years teaching as a full-time secondary teacher (choral director) in a public comprehensive high school
- 2) Membership in professional organizations, ACDA and MENC, and recommended by at least one officer of state or division ACDA or MENC
- 3) Consistent Superior ratings at Florida or Georgia State Choral Festivals

Each of the five teachers was videotaped teaching two different music rehearsals: a beginning choir and an advanced choir. The voicing of each pair was the same for four of the five teachers (SSA or SATB) and the fifth teacher had a beginning SSA and an advanced SATB choir. All of these choirs met every day with their teacher.

Information about the individual choirs was not pertinent beyond their ages of 15-18 years, and their enrollment in chorus during the regular school day. Teachers were interviewed prior to the videotaping but given no specific information about the study. An informed consent form and brief biographical survey were obtained from each teacher (see Table 1).

Subjects were asked to also provide brief descriptions of their approach to planning a rehearsal and whether the approach might differ with their advanced and beginning choirs (see Chapter 4).

Table 1

Description of Subjects

Subject	Total Years Teaching	Years Teaching High School	Educational Background	Attended Workshop on Pacing?	Have read an article on pacing?	Subscribe to JRME
A	7	7	B.M.(Voice) M.M.E.	yes	yes	no
B	17	7	B.M.E., M.M. (Kodaly Spec.)	yes	yes	no
C	10	9	B.M.E., M.M.E. in progress	yes	yes	yes
D	11	6	B.M.E., M.M.E.	yes	no	no
E	14	8	B.S. Music Ed, M.M.E. in progress	no	no	no

Descriptions of Pace

Rehearsal Structures. Rehearsal structure, as described by James Cox, was applied to the ten observed rehearsals. Table 9 is a summary table of all rehearsal segments and the percentage of rehearsal time spent in each segment. This information, along with recorded rates per minute, duration of behaviors, and recorded observations of the teacher, are useful in a comparison of rehearsal structures.

Structure A was the highest rated by teachers in previous studies. Fifty-two% of the teachers in the Cox (1989) study indicated this as their top preference. The rehearsal begins with familiar or enjoyable songs, moves to more detailed, analytical study of works in the development stages, and ends

with a faster paced activity. Students rated these directors using structure A as the most stimulating and enthusiastic teachers.

Structure B is based loosely on the “Rule of Golden Proportion” (Pascoe, 1973). Rehearsals begin with a fast paced opening activity and then proceed to a slower paced, but forward moving activity that builds to a climax 2/3 into the rehearsal. After a more relaxed (down-time) period the rehearsal intensity builds again to the end. This was preferred by 22% of surveyed directors. Students found these directors more patient and less stimulating and enthusiastic. Cox suggests that directors using this type of teaching must plan carefully to control the building intensity and time their rehearsal to allow a climax at the “right” moment (Cox, 1989).

Structure C alternates familiar/new, easy/difficult literature and uses frequent changes of activity of shorter durations. The rehearsal begins and ends with faster paced activities and structures slowed-paced activities during the middle portion of the rehearsal. Structure C was preferred by 25% of directors in the 1989 study. None of those directors surveyed were strongly negative about either of the other structures (Cox, 1989).

Elements of Time. Subjects have rated the pacing of music lessons higher when the rates per minute of activities were high and the mean durations of teacher and student behaviors were shorter (Duke, Prickett, & Jellison, 1998). The frequent alternation of behaviors demonstrated by a high rate per minute indicates how many times activities are changed during one minute. Frequent opportunity to perform combined with shorter durations of instruction and

performance has been identified as one model of effective, fast pacing (Duke, 1997; Duke & Henninger, 2002).

Direct Instruction. Direct Instruction involves the use of sequential patterns of instruction by teachers. Yarbrough and Price (1989) first applied this model to music lessons. A complete sequential pattern would include a task presentation, student performance, and related feedback. Studies investigating sequential patterns have shown that expert teachers frequently use incomplete cycles, and Bowers (1997) suggested that a complete pattern was not necessarily superior to an incomplete pattern. Price & Yarbrough (1994) investigated the function of disapprovals in sequential patterns and showed patterns with approvals or no feedback to be preferred over non-specific disapprovals. Since music students have frequent opportunities to respond, expert teachers have been shown to use feedback at a rate of one or two feedback statements per minute, and following fewer than 30% of student responses (Duke & Henninger, 2002).

Procedure

Videotapes of 10 rehearsals conducted by 5 experienced teachers were made on normal school days, i.e. no scheduled or disruptive events, such as a pep rally, fund-raising activity, or fire drill. Rehearsals immediately before or after performances also were avoided to increase the likelihood of a normal day. All

rehearsals were planned by the director to accommodate literature and music instruction needs of the group and teacher goals.

Videotapes were recorded using a Sony Hi-8 Camera and Sony high-resolution Hi-8 tapes. Tapes were copied onto VHS format for playback on a Sharp TV/VCR with a digital counter and remote control.

Teacher A and Teacher C were observed and recorded by the investigator on December 4, 2001. The researcher observed and recorded teacher D on December 5. Teacher B was observed and recorded by an experienced videographer on January 15, 2002, and Teacher E was observed and recorded by the researcher on January 17, 2002.

The camera angle for each tape was as identical as possible in the different choir rooms and close enough to the subjects to ensure quality audio. The camera was focused on the teacher at an angle that allowed the researcher a partial view of the choir. The audio of the teacher and the students was clear and easy to understand.

Data Analysis

Each tape was viewed and the beginning and ending time of each teacher and student behavior was notated in minutes and seconds. When behaviors occurred simultaneously, they were recorded in both categories resulting in the total seconds of rehearsal behaviors exceeding the sum of teacher seconds plus students' seconds.

The researcher viewed each tape in this study. During the first viewing, each behavior/activity was detailed in exact minutes and seconds, and behaviors described in short descriptive phrases. Categories of behaviors/activities were developed using existing categories found in several model studies detailed in Chapter 2 (Duke, Prickett, & Jellison, 1998; Yarbrough & Madsen; Yarbrough & Henley, 1999).

Categories of Behaviors. R.S. Moore (1976) developed and first used The Music Teaching Reinforcement-Activities Form (MTRA) to quantify teacher and student behaviors. This form provided a means for recording continuous activities over time. Wagner and Strul (1979) used this form for their study that involved recording behaviors/activities across time. A study by Duke, Prickett, and Jellison in 1998 discussed methods of recording verbalizations by teachers and students. Teacher reinforcements were categorized and defined by Yarbrough and Madsen (1998). Madsen and Madsen (1974) defined many of the behaviors used in studies involving time and recording behaviors across time.

After analyzing descriptive notes from the original playback, final categories of teacher and student behaviors were determined, and assigned symbols for observation and recording purposes, using previous investigations as a model (Moore, 1976; Yarbrough & Price, 1998; Duke, Prickett, & Jellison, 1998; Madsen & Madsen, 1974). Table 2 lists the categories and briefly describes the behaviors for teacher behaviors and student responses used in the final data analysis. In the current study the categories of behaviors were labeled 1-2-3, as found in Direct Instruction studies. Feedback is described as 3a

(approval) or 3d (disapproval) and student performance is divided into singing behaviors (2p) and verbal or non-verbal response (2r). Two trained researchers analyzed 10% of the recorded data to provide reliability of .95 (agreements divided by agreements plus disagreements).

Table 2

Symbols Used in Data Analysis

- 1o** Teacher off-task talk, social discussions
- 1a** Teacher academic instruction or specific directives related to student learning. Can include short interchanges between student and teacher
- 1ar** Verbal Instruction while students are responding
- 1p** Teacher modeling by singing or playing
- 2o** Student off-task talk, social
- 2r** Student response, verbal or non-verbal (clapping, counting rhythms)
- 2p** Student performance response, singing
- 3a** Approval (positive academic or social feedback)
- 3d** Disapproval (negative academic or social feedback)

Describing the Data. Videotapes were analyzed and described with a 3-step process. First, initial minutes were timed in minutes and seconds. Second, rehearsal segments were determined and converted to seconds. (see Appendix

A for complete rehearsal data). Third, categories of teacher and student behaviors were tabulated and converted to percentages, durations, and rates per minute. (see Appendix B & C for complete summary data).

The data were analyzed for each rehearsal in spreadsheets using Microsoft Excel (see Appendix A). Tapes were again reviewed to determine when a major shift in activity took place. These major shifts were used to divide the rehearsals into Rehearsal Segments. Durations were then converted to seconds only. Classification of the initial minutes was Rehearsal Segment 1 (RS 1) and then at cell A32 the first shift took place (“take out piece one and turn to page 4”) and Rehearsal Segment 2 (RS2) begins. All five subjects began all ten rehearsals with a warm up period, followed by a shift to a major activity such as a teaching unit on sight-reading or rehearsal of the first piece.

Rehearsals were divided into rehearsal segments and the data compiled for each rehearsal. Frequency of behaviors, duration of behaviors, and percentages of behaviors within each rehearsal segment and for the complete rehearsal were tabulated using equations in Microsoft Excel spreadsheets. Frequencies were obtained for total teacher behaviors and student behaviors and converted to percentages for ease of comparison. Percentages of each behavior within each rehearsal segment and for the entire rehearsal were obtained.

Percentages of the rehearsal segments were obtained as well as the durations and rates per minute for teacher and student behaviors. These figures are useful in determining the rehearsal structures used and how the subjects fit into all of the pacing models and descriptions used in this study. By comparing

data of durations and rates per minute to previous rehearsal structures and descriptions of pacing, information about the rehearsal structure and the teacher's rehearsal pacing can be determined. Using the rehearsal data and also observing the many variables of each rehearsal, observed routines, the familiarity and difficulty of the repertoire, and use of feedback, a "snap-shot" is obtained for each rehearsal using descriptions of pacing from the literature.

CHAPTER FOUR

RESULTS

Previous studies have focused on identifying behaviors that contribute to effective teaching and promote student learning. These behaviors, also labeled activities by some authors, have been measured to determine duration, rate per minute, percentage of rehearsal time, and structure of the overall rehearsal. Units of time have been measured by time sampling (Yarbrough & Price, 1981, 1989; Witt, 1986), by using excerpts of lessons (Yarbrough 1987, Price, 1992, Duke, 1986, Yarbrough & Madsen, 1998; Duke & Henninger, 2002), and through longitudinal studies of behaviors across many rehearsals (Yarbrough, Dunn, et al., 1999). The purpose of this study was to investigate instructional pacing by observing and recording five experienced teachers in rehearsal, to describe their rehearsal behaviors, and compare their usage of time to multiple rehearsal structures and descriptions of pacing drawn from existing literature.

In this study, “rehearsal segment” is used to identify a major period of activity within a rehearsal. Many different teacher and student behaviors occur independently during each rehearsal segment. For example, during the warm up period (Rehearsal Segment 1) there may be teacher modeling, students performing breathing exercises, teacher feedback or instructions, students

performing scale exercises, etc. All of these behaviors were observed and recorded during the first rehearsal segment. A shift in activity, such as beginning a new piece of music, would indicate a new rehearsal segment.

Rehearsal Descriptions

Time Measurements

Ten rehearsals were recorded and durations measured in seconds. The average rehearsal duration was 2965 seconds, or slightly over 49 minutes.

Durations throughout this study are expressed in seconds. Table 3 illustrates the ten rehearsal segments of the five teachers' rehearsals.

Table 3						
Number of Rehearsal Segments						
Teacher	A	B	C	D	E	
Beginning Choir	4	4	4	5	5	mean = 4.5
Advanced Choir	5	3	4	4	3	mean = 3.8
Mean for all ten rehearsals= 4.1 rehearsal segments						
Average duration of rehearsal=2965 seconds or slightly over 49 minutes						

Rehearsals of the advanced choirs had fewer rehearsal segments than the beginning choirs, but all ten rehearsals deviated only slightly from the overall mean number of 4.1 rehearsal segments. Tables 3 and 4 provide a complete look at the percentages of the total rehearsal for each rehearsal segment, and the durations of each rehearsal segment.

	TEACHER A		TEACHER B		TEACHER C		TEACHER D		TEACHER E	
	BEG.	ADV.	BEG.	ADV.	BEG.	ADV.	BEG.	ADV.	BEG.	ADV.
Rehearsal Segment 1	834.00	900.00	1001.00	524.00	1584.00	916.00	602.00	296.00	430.00	664.00
Rehearsal Segment 2	605.00	959.00	958.00	771.00	280.00	624.00	1056.00	580.00	559.00	1332.00
Rehearsal Segment 3	695.00	175.00	347.00	1215.00	826.00	583.00	772.00	866.00	387.00	964.00
Rehearsal Segment 4	746.00	768.00	593.00	474.00	498.00	755.00	361.00	1153.00	1184.00	
Rehearsal Segment 5		135.00					197.00		478.00	

Table 4 Rehearsal Segments: Duration in Seconds

	TEACHER A		TEACHER B		TEACHER C		TEACHER D		TEACHER E	
	BEG.	ADV.	BEG.	ADV.	BEG.	ADV.	BEG.	ADV.	BEG.	ADV.
Rehearsal Segment 1	29.00	30.60	34.50	17.50	49.70	31.80	20.10	10.20	14.20	22.40
Rehearsal Segment 2	21.00	32.70	33.00	25.80	8.80	21.70	35.70	20.00	18.40	45.00
Rehearsal Segment 3	24.10	6.00	12.00	40.70	25.90	20.30	25.80	29.90	12.70	32.60
Rehearsal Segment 4	25.90	26.10	20.50	15.90	15.60	26.20	12.10	39.80	39.00	
Rehearsal Segment 5		4.60					6.60		15.70	

Table 5 Rehearsal Segments: Shown as Percentages

Percentages of Time. Proportions of time in Table 4 are expressed as percentages to allow comparison of rehearsals of different durations (Duke, Prickett, & Jellison, 1998). Each behavior was measured in seconds for the ten rehearsals, divided into rehearsal segments, and expressed as a percentage of the total time in rehearsal (see Tables 4 & 5). The mean percentage for Beginning Choir rehearsal segments was 30% of the total rehearsal length, and the mean percentage for Advanced Choirs was 26.3%.

Percentages and durations of the rehearsal segments showed no consistency between each subject's beginning and advanced choir. The percentage of time spent in rehearsal segments varied greatly, from 4.6% to 49.7%. Even though the mean percentage for beginning choirs was 30% and 26.3% for advanced choirs, only 8 of the 19 advanced choir rehearsal segments were over 30% of the total rehearsal and only 5 out of 22 rehearsal segments of the beginning choirs were over 30% (see Tables 4 & 5).

One rehearsal, Teacher A-Beginning Choir, showed a nearly equal division of rehearsal time with 4 rehearsal segments percentages of 29, 21, 24, and 26%, and Teacher C-Advanced Choir showed a similar structure to Teacher A, with percentages of 32, 22, 20, and 26%. The other rehearsals by Teachers B, D, and E were more widely varied in time spent in each rehearsal segment.

Frequency of Behaviors. Each observed behavior by teacher or student were identified and measured in seconds. The highest recorded teacher behavior involved academic instruction (408 behaviors) and student performance

behaviors were the highest recorded student behavior (609 behaviors; see Table 6). Experienced teachers and their students had more behaviors of actual teaching (1a) and performing (2p) than any other behavior, and as shown, also spent a high percentage of their time teaching and engaging in performance activities, which supports earlier studies (Goolsby, 1996; see Table 11).

Durations of Behaviors. The previous definition of pacing in terms of short versus long duration have shown the longer excerpts rated as slower paced and rated lower in overall effectiveness than shorter, faster paced excerpts (Yarbrough, 1988; Yarbrough & Madsen, 1998). The highest rated excerpts showed 5-6 seconds mean length of teacher or student behavior/activity and the slow paced excerpts had 9-28 seconds of alternating student performance and teacher talk. Yarbrough & Henley (1999) reported similar results. These short/long means served as guides for rehearsal analysis in this study.

Table 7 shows the number of observed and recorded behaviors and the mean durations in seconds for the previously defined categories of teacher and student behaviors. The mean duration for teacher behaviors in Beginning Choirs was approximately 17 seconds, and 26 seconds mean duration for student behaviors in this study. Durations were 16 seconds for teachers in the advanced choirs and 31 seconds for students (see Table 7).

Yarbrough (1999) reported that lower ratings were given rehearsals with slow pacing of 9-28 seconds of teacher/student alternating behaviors. By that definition, the mean for the five teachers and their students in the present study would be considered slow-paced, 16.6 seconds in Beginning Choirs and 15.6

Categories of Behaviors		TEACHER A		TEACHER B		TEACHER C		TEACHER D		TEACHER E	
		Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir
		Frequency		Frequency		Frequency		Frequency		Frequency	
Teacher Off-task (Verbalizations)	1o	5	7	2	10	14	12	8	8	9	10
Academic Instruction	1a	29	39	37	23	39	48	53	62	42	36
Academic Instruction during Student Response	1ar	10	10	16	20	19	10	4	5	7	9
Teacher Modeling	1p	16	20	17	5	16	11	15	13	10	16
Teacher Modeling During Student Response	1pr	0	0	0	6	3	2	3	0	3	1
Student Off-task (verbalizations)	2o	6	5	0	2	7	6	11	4	2	2
Student Response	2r	8	2	36	16	13	10	5	12	20	11
Student Performance	2p	46	82	46	43	75	69	69	87	40	49
Teacher Academic Approval	3a	14	20	10	13	4	5	19	24	18	12
Teacher Academic Disapproval	3d	2	8	5	15	14	8	2	7	16	11
Teacher Social Disapproval	3sd	0	1	0	0	3	0	0	0	2	0

Note. Academic Instruction includes directions

Table 6 Frequency of Teacher and Student Behaviors

Categories of Behaviors		TEACHER A		TEACHER B		TEACHER C		TEACHER D		TEACHER E	
		Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir
Teacher Off-task (Verbalizations)	1o	33.60	18.29	45.00	47.00	20.71	11.17	28.38	25.38	22.33	35.50
Academic Instruction	1a	29.34	14.69	33.00	18.00	17.90	16.33	15.87	12.45	24.98	13.14
Academic Instruction during Student Response	1ar	49.00	35.60	39.63	42.15	30.16	38.60	55.50	16.20	9.00	43.00
Teacher Modeling	1p	9.69	10.15	5.88	7.40	6.31	9.64	13.00	12.31	10.90	13.06
Teacher Modeling During Student Response	1pr	0.00	0.00	0.00	37.00	23.67	32.50	56.67	0.00	47.33	69.00
Student Off-task (Verbalizations)	2o	29.50	24.80	0.00	91.50	14.86	21.17	32.36	31.75	46.00	40.00
Student Response	2r	15.75	21.00	15.75	45.38	29.69	30.50	41.00	11.50	13.90	31.64
Student Performance	2p	30.65	21.04	22.88	27.21	20.93	20.04	16.38	1454	20.05	26.00
Teacher Academic Approval	3a	10.86	7.65	18.60	12.00	13.75	16.40	7.42	10.42	12.94	8.25
Teacher Academic Disapproval	3d	9.00	9.00	8.60	13.53	16.75	7.13	7.50	9.43	26.43	20.82

Note. Categories were derived from selected variables of direct instruction literature

Table 7 Mean Duration in Seconds of Teacher and Student Behaviors

seconds in Advanced Choirs for teachers, and 26 seconds and 31 seconds student mean durations. It is important to note that teacher instruction during student response (1ar) is included in these figures and was not included in calculations of earlier studies. While teacher performance (1p) and feedback behaviors (3a/3d) were of short duration for all ten rehearsals, teacher academic instruction (1a) ranged from 12.45 seconds to 33 seconds, student performance and verbal responses (2p/2r) varied from 11.05 seconds to 45.38 seconds (see Table 8). Yarbrough (1998) suggested that research involving rehearsal pacing be very specific concerning length of excerpts, what is reported, and how comparisons are made.

Rates per Minute of Behavior Changes. Rates per minute of behavior changes were calculated for each rehearsal segment to determine the frequency of the alternation of activities. The rate per minute indicates how many times in one minute there is a change in behavior. Previous attempts to define pacing (Duke, Prickett, & Jellison, 1997; Yarbrough, 1988) have used rate per minute as a significant indicator of effective pacing. The pace of instruction was rated higher when the frequency of alternation was higher and durations were shorter. The rates per minute of behaviors for each teacher and choir are reported by rehearsal segment (see Table 9). Teacher and student combined rates per minute averaged 3.06 changes of behavior per minute.

Experienced teachers alternated activities at a slightly higher rate per minute in their advanced choir rehearsals, but students showed a higher rate of

Table 8 Mean Duration of Behaviors Shown in Seconds

BEHAVIORS	BEGINNING CHIORS									
	1o	1a	1ar	1p	3a	3d	2s	2r	2p	
TEACHER										
A	33.60	29.34	49.00	9.69	10.86	9.00	29.50	15.75	30.65	
B	45.00	33.00	39.63	5.88	18.60	8.60	0.00	15.75	22.88	
C	20.71	17.90	30.16	6.31	13.75	11.09	14.86	29.69	20.93	
D	28.38	15.87	55.50	13.00	7.42	7.50	32.36	41.00	16.38	
E	22.33	24.98	9.00	10.90	12.94	24.43	46.00	13.90	20.05	
TOTAL	150.02	121.09	183.29	45.78	63.57	60.62	122.72	116.09	110.89	
MEAN DURATION	30.00	24.22	36.66	9.16	12.71	12.12	24.54	23.22	22.18	
MEAN DURATION FOR TEACHER BEHAVIORS= 16.61 SECONDS					MEAN DURATION FOR STUDENT BEHAVIORS= 25.80 SECONDS					

BEHAVIORS	ADVANCED CHOIRS									
	1o	1a	1ar	1p	3a	3d	2s	2r	2p	
TEACHER										
A	18.29	14.69	35.60	10.15	7.65	9.00	24.80	21.00	21.04	
B	47.00	18.00	42.15	7.40	12.00	13.53	91.50	45.38	27.21	
C	11.17	16.33	38.60	9.64	16.40	7.13	21.17	30.50	20.04	
D	25.38	12.45	16.2	12.31	10.42	9.43	31.75	11.5	14.54	
E	35.50	13.14	43.00	13.06	8.25	20.82	40.00	31.64	26.00	
TOTAL	137.34	74.61	175.55	52.56	54.72	59.91	209.22	140.02	108.83	
MEAN DURATION	27.47	14.92	35.11	10.51	10.94	11.98	41.84	28.00	21.77	
MEAN DURATION FOR TEACHER BEHAVIORS= 15.59 SECONDS					MEAN DURATION FOR STUDENT BEHAVIORS= 30.54 SECONDS					

Table 9 Rate per Minute of Behavior/Activity Alternation

28

	TEACHER A		TEACHER B		TEACHER C		TEACHER D		TEACHER E			
	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir
Rehearsal Segment 1	2.93	3.77	3.10	1.39	2.39	3.37	7.68	3.56	4.14	2.75		
Rehearsal Segment 2	4.22	4.87	1.56	3.27	4.15	4.17	3.20	4.83	2.21	3.38		
Rehearsal Segment 3	1.59	3.95	1.98	1.77	3.41	3.13	3.24	6.15	2.66	2.95	All Rehearsals	
Rehearsal Segment 4	1.61	3.61	2.60	4.72	3.85	2.99	1.20	4.13	2.97		2.94	3.53
Rehearsal Segment 5		1.59					1.85		2.74			
mean rate	2.59	3.56	2.31	3.72	3.45	3.42	3.43	4.67	2.94	3.03		
	STUDENT A		STUDENT B		STUDENT C		STUDENT D		STUDENT E			
	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir	Beginning Choir	Advanced Choir
Rehearsal Segment 1	1.47	1.97	2.26	0.97	1.79	2.25	4.86	2.45	2.92	1.90		
Rehearsal Segment 2	4.41	4.18	4.98	2.37	4.68	3.01	2.74	5.11	1.33	2.31		
Rehearsal Segment 3	1.55	1.80	3.09	1.23	4.33	3.74	2.53	4.25	2.86	2.27	All Rehearsals	
Rehearsal Segment 4	2.05	3.90	3.47	3.59	4.36	2.71	1.45	3.93	3.46		3.04	2.74
Rehearsal Segment 5		0.75					1.44		4.26			
mean rate	2.37	2.52	3.45	2.72	3.79	2.93	2.60	3.94	2.97	2.16		

choirs were given more frequent opportunities to respond than students in the advanced choirs. Teacher D-Beginning Choir recorded the lowest teacher rate per minute in Rehearsal Segments 4 and 5 (1.20 and 1.85), but the highest teacher rate (7.68) was observed Rehearsal Segment 1. Student rate per minute was also much lower in Rehearsal Segment 4 and 5 (1.45 and 1.44) compared to the first rehearsal segment where the student rate was 4.86. To most accurately interpret rate per minute significance, information must be available about the entire rehearsal structure and where in the rehearsal structure the rates occur. Observations of all the rehearsal segments, behavior data, and literature used, document that Teacher D was using a “sing through” for closure activities, similar to Teacher A, whose lowest rates per minute were also at the end of the rehearsal. Rehearsal Segments 1 and 2 had higher rates per minute than subsequent rehearsal segments in eight of the ten observed rehearsals (see Table 9).

Initial Rehearsal Minutes (Rehearsal Segment 1)

Music classrooms, both vocal and instrumental, differ from general education classrooms in ways that affect how lessons are structured. Students in choral rehearsals use their vocal cords as their instrument and therefore Rehearsal Segment 1 has a special function in the overall rehearsal structure. The initial minutes of a rehearsal have been studied and described. (Brendell, 1992, 1996). Many teachers were reported to have elapsed times of several

minutes before beginning instructional activities, and teachers with the least amount of time spent “getting ready” had the lowest off-task student behaviors. The initial minutes of each rehearsal in this study have been analyzed to describe teacher and student behaviors and activities.

Initial seconds were counted from the ringing of the bell to the first teacher interaction with the entire group of students for the purpose of instruction or announcements (see Table 10). The five experienced teachers showed similarities in the first minutes of Rehearsal Segment 1 with 60 seconds or less time elapsed before beginning the lesson. Teacher B delayed the rehearsal in the advanced choir because a student had been hospitalized and the teacher took time to explain to the students what had happened and pass a card around the room.

Table 10

Seconds Elapsed Before Initial Teacher Behavior

TEACHER	A	B	C	D	E
Beginning Choir	26	57	40	12	60
Advanced Choir	28	171	4	26	30

Description (Rehearsal Segment 1). All ten rehearsals began within the first 60 seconds from the bell (see Table 10). The time that elapsed was primarily

spent in teacher and student off-task or social interactions. Each classroom had an established structure for initial minutes of rehearsals so that little time was spent giving directions or getting ready. Students typically quickly moved to their assigned seats with few reminders or cues from the teachers. Musical cues such as a phrase sung by the director or played on the piano were used frequently to signal the beginning of class. All five teachers began rehearsals with a warm up period (Rehearsal Segment 1) that consisted of breathing exercises, vocalises, rounds, and familiar songs, supporting the findings that established routines are used by experienced teachers and contribute to teacher effectiveness (Brophy, 1986; Brendell, 1996).

Percentage of time (Rehearsal Segment 1). The figures in Tables 4 & 5 show all rehearsal segments from the ten observed rehearsals. Rehearsal Segment 1 records the time from the bell until a major change in activity, and is expressed as a percentage of the total rehearsal. This table indicates how much time teachers invested in the initial instructional minutes of the rehearsal. Percentages show a wide range from 10.2 % to 49.7%. Only Teacher A structured a similar percentage of time in the first rehearsal segment with the beginning and advanced choirs, 29% and 30.6% respectively. The mean percentage for all beginning choirs was 29.8% and the mean percentage for all advanced choirs was 27.7% of the total rehearsal time spent in Rehearsal Segment 1.

Behaviors (Rehearsal Segment 1). Physical warm ups, including stretching and massages, began nine of the ten rehearsals. Teacher D began

this while students were still entering the room. Teacher A-Advanced Choir began immediately with vocal exercises while students were still gathering materials. Directors in all rehearsals accompanied warm up vocalises and songs on the piano, but singers were frequently allowed to sing without assistance from the piano. All observed teachers used solfege singing during this warm-up time and two teachers also incorporated sight-reading (with solfege) and ear-training exercises as part of Rehearsal Segment 1. Two teachers, Teacher B and D, used exercises that primarily focused on tonal production and used imagery and techniques more commonly associated with vocal instruction while exercises used by the Teachers A, C, and E focused more on the breath and physical readiness.

Rate per minute of behaviors (Rehearsal Segment 1). Table 6 shows the behaviors that were observed and recorded. Behaviors with the prefix number 1 or 3 are labeled teacher, and the number 2 is used for student behaviors (Price & Yarbrough, 1991). These labels are derived from labels used in direct instruction studies. Table 6 recorded the number of total behaviors for each rehearsal, and is used with the mean durations given in Tables 7 and 8 to calculate the rate per minute of behaviors found in Table 9.

The mean rates per minute of behaviors in Rehearsal Segment 1 widely varied, but teacher rates were consistently higher than the student rate per minute in beginning and advanced choirs (see Table 9). The mean rate per minute for teacher behaviors in the beginning choirs was 4.05 and 3.18 in the

advanced choirs. The student mean rate for behaviors in beginning choirs was 2.66 and 2.05 in the advanced choirs.

Highest rate per minute (Rehearsal Segment 1). Teacher D demonstrated a considerably higher rate of teacher behaviors in the beginning choir rehearsal than any other rehearsal. Teacher D and the beginning choir demonstrated 37 teacher behaviors and 30 student behaviors in a period of 602 seconds (approximately 10 minutes). Six specific approvals (3a) were given during this time. The fast pace of Teacher D was demonstrated by short durations, frequent alternations of the teacher and student activities, and many opportunities for student participation, supporting the recommendations of Duke, Prickett, & Jellison (1998). The teacher's instruction was focused on singing with correct vocal production and students were allowed many opportunities to demonstrate improvement (4.86 rate per minute of student behaviors, see Table 9).

Lowest rate per minute (Rehearsal Segment 1). Teacher C demonstrated the lowest rate per minute of behavior change in Rehearsal Segment 1, Beginning Choir. The 2.39 rate per minute (teacher), and 1.79 rate per minute (student) recorded for almost 50% of the rehearsal time, would suggest a slower pace. The less frequent alternation of activities and lengthy durations of student response and performance time, is consistent with lower rated excerpts (Yarbrough & Madsen, 1998). Once Teacher C changed activities, the following rehearsal segments had much higher rates per minute for teacher and students alternation of activities (see Table 9).

Applying Descriptions of Pacing

The purpose of this study was to investigate instructional pacing by observing and recording five experienced teachers in rehearsal, to describe their rehearsal behaviors, and compare their usage of time to multiple rehearsal structures and descriptions of pacing drawn from existing literature. These previous studies provide a means of describing the ten rehearsals in this study to find common results and insight into how experienced teachers use different effective teaching strategies to structure a well-paced rehearsal. 1) Rehearsal structures (Cox, 1989) give an overview of the entire structure and where slower and faster activities are placed. 2) The frequency and duration analysis looks at how often the behaviors change and length of durations to provide one way to determine fast or slow pacing. 3) When the behaviors observed in this study are applied to a Direct Instruction model the sequencing of patterns is shown and occurrences of feedback can be analyzed.

Subjects followed Cox rehearsal structures in 9 of the 10 rehearsals. Six rehearsals closely followed structure C, three rehearsals followed structure A. One rehearsal demonstrated structure A but with the extended build up to a rehearsal climax consistent with structure B (see Table 11).

Table 11

Rehearsal Structures Used in Ten Rehearsals

Teacher		A	B	C	D	E
Beginning Choir		C	A	C	C	C
Advanced Choir		C	A	C	A/B	A

Rehearsal Planning by Subjects

Teacher A reported planning rehearsals by beginning with tasks that can be easily accomplished and then move to more challenging objectives. Teacher A also plans for more review and repetition with the beginning choir.

Teacher B reported planning rehearsals in great detail, rotating new with familiar pieces and also varying accompanied with unaccompanied. Warm ups are planned to move from physical to vocal to solfege work. Teacher B uses this basic plan for rehearsals of all levels.

Teacher C reported planning each rehearsal for several fast paced activities. No attempt was made to plan differently for beginning or advanced.

Teacher D used a weekly rehearsal plan and reported structuring 10 activities in each rehearsal, both beginning and advanced.

Teacher E used a three-part structure for planning; warm up, sight-reading, and literature study and follows this with beginning and advanced choirs.

Determining Faster or Slower Pacing

Elements of time measured in this study varied from the highest rate per minute, 7.68 changes per minute, to a low rate of .75 (see Table 9). Durations also widely varied from the shortest duration of 12 seconds to the longest, 22 seconds of teacher mean duration, and student durations as lengthy as 38 seconds. Table 12 gives the rates and durations that will be used to indicate fast or slow pacing and a summary of findings from all 10 rehearsals.

Table 12

Summary of 10 rehearsals

Fast	rate per minute above 6	5-8 seconds
Moderately fast	rate per minute 4.5-5.9	9-12 seconds
Moderately slow	rate per minute 3.0-4.4	13-18 seconds
Slow	rate per minute under 3	above 19 seconds

Beginning Choirs	A	B	C	D	E
Teacher Rate per Minute	2.93	2.31	3.45	3.43	2.94
Teacher Durations	18 sec.	22 sec.	14 sec.	14 sec.	19 sec.
Student Rate per Minute	3.56	3.45	3.79	2.6	2.97
Student Durations	25 sec.	19 sec.	16 sec.	31 sec.	23 sec.
Description of Pacing *	Mod.Slow	Slow	Mod.Slow	Mod.Fast	Mod.Slow
Feedback Ratio **	3:1	4:1	5:1	3.5:1	3:1

Table 12 - continued

Advanced Choirs	A	B	C	D	E
Teacher Rate per Minute	2.37	3.72	3.42	4.67	3.03
Teacher Durations	12 sec.	20 sec.	12 sec.	13 sec.	18 sec.
Student Rate per Minute	2.52	2.72	2.93	3.94	2.16
Student Durations	36 sec.	38 sec.	20 sec.	22 sec.	26 sec.
Description of Pacing*	Mod.Fast	Mod.Slow	Mod.Fast	Mod.Fast	Mod.Slow
Feedback Ratio **	3:1	2:1	6:1	3:1	3:1

* Pacing description is based on teacher and student rates per minute, duration, use of feedback, and rehearsal structure.

** Ratio derived from number of student responses to number of feedback statements

Teacher A: Descriptions of Pacing

Table 13

Teacher A (see also Tables 14-16)

BEGINNING CHOIR-Teacher A			
Structure C	4 RS	Alternates fast/slow, easy/difficult	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm	2.93	RS 1 Rpm	1.47
Total Rpm	2.59	Total Rpm	3.56
Mean Duration	18 sec.	Mean Duration	25 sec.
% Time	56%	% Time	44%
Overall Pacing		Moderately Slow	
Student Responses/ Feedback 14 approvals/2 disapprovals		Ratio 3:1	

RS=Rehearsal Segment Rpm=Rate per minute

ADVANCED CHOIR-Teacher A			
Structure C	5 RS	Alternates styles and fast/slow	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm	3.77	RS 1 Rpm	1.97
Total Rpm	2.37	Total Rpm	2.52
Mean Duration	12 sec.	Mean Duration	36 sec.
% Time	37%	% Time	63%
Overall Pacing		Moderately fast	
Student Responses/ Feedback 20 approvals/8 disapprovals:		Ratio 3:1	

RS=Rehearsal Segment Rpm=Rate per minute

Beginning Choir: Rehearsal Structure. The rehearsal for the Beginning Choir followed Structure C, alternating between slow and fast tempos, and varying the level of difficulty of the literature rehearsed. After the warm up rehearsal segment, the choir rehearsed three different pieces. The tempos and difficulty of the music were varied: slow, fast, easy, and moderately difficult. While the percentage of time spent in each rehearsal segment was almost evenly divided (see Tables 4 & 5), the rate per minute showed wide variation. Rehearsal Segment 2 showed teacher rate per minute of 4.22 and a student rate per minute of 4.41. The next rehearsal segment demonstrated a lower 1.59 rate per minute for teacher behavior changes, and 1.55 rate per minute for student changes (see Table 9). Variances in faster-paced and slower-paced activities were consistent with Structure C. Observations of the rehearsal indicated that in Rehearsal Segment 2 the least familiar and the most difficult literature were rehearsed. The following two rehearsal segments rehearsed familiar and easier pieces of literature, which followed the alternating activities model of Structure C.

Beginning Choir: Frequency. Rate per minute and mean durations for the four Rehearsal Segments indicated that pacing ranged from moderately fast to slow (see Table 9). The mean durations for student behaviors in Rehearsal Segments 1, 3, and 4 range from 28 seconds to 40 seconds, all lengthy and consistent with slower-paced lessons. However, the durations for Rehearsal Segment 2 shows student mean duration of 9 seconds, and a teacher rate of 16 seconds (see Table 7). During this detailed and analytical work of a newer and

more difficult piece, the pacing demonstrated was faster and consistent with highly rated excerpts. The rates per minute of 4.22 and 4.41 for teacher/student in Rehearsal Segment 2 were also the highest for Teacher A.

Beginning Choir: Direct Instruction. Teacher A used feedback at a high rate and recorded the highest approvals during Rehearsal Segment 2, while rehearsing the most more difficult piece. Sixteen feedback behaviors were observed during the rehearsal and seven of those were during this rehearsal segment (see Table 6). Complete teaching cycles were used through most of the rehearsal with a high ratio of approvals to disapprovals, with the feedback to student response and performance ratio of slightly above 3:1 (see Table 10). This type of complete cycle is common to expert teachers and has been identified as effective use of sequential patterns, especially with older, more musically sophisticated students.

Advanced Choir: Rehearsal Structure. The advanced choir alternated “singing through” a familiar piece and detailed work on newer material, demonstrating Cox Structure C. The four pieces rehearsed were varied: 1) a cappella World Music selection, 2) a slow accompanied piece, 3) a holiday folk song, 4) a contemporary piece with a fast tempo in Spanish. Teacher A divided this rehearsal into five rehearsal segments, and the percentage of time widely varied from 33% in Rehearsal Segment 2, to 6% and 5% in Rehearsal Segments 3 and 5 (see Tables 4 & 5). Rehearsal Segments 2 and 4 were the fastest paced and demonstrated the most intense rehearsal behaviors with higher rates per minute and shorter durations (see Tables 13 & 17). The third rehearsal segment

was a brief 175 seconds in length, but must be considered a Rehearsal Segment since a different piece was rehearsed by the choir. The shorter rehearsal segment provided contrast between the more detailed rehearsal segments, consistent with Structure C.

Advanced Choir: Frequency. Teacher A allowed frequent opportunities for student performance in Rehearsal Segments 2 and 4. Table 14 recorded 34 student performance behaviors (2p) in Rehearsal Segment 2 and 24 (2p) behaviors in Rehearsal Segment 4. The shorter durations of these behaviors (14 and 17 seconds) make these rehearsal segments consistent with faster pacing models of frequency and duration. The teacher durations of 1a behaviors during those rehearsal segments were also under 20 seconds and Teacher A's mean duration of 1a for the total rehearsal time was 13 seconds. Teacher A used over 50% of the rehearsal for student performance with high frequency of 2p, 82 recorded behaviors. Table 14 categories, and observations, demonstrate that Rehearsal Segment 5 was a "sing through", an effective closure activity. One teacher instruction and one student performance behavior of 80 seconds was recorded when the bell rang. Observations of the rehearsal showed students continued to sing while they gathered their belongings and left the room.

Advanced Choir: Direct Instruction. Teacher A used feedback at a high rate in Rehearsal Segment 2 (see Table 15). Fourteen approvals and five disapprovals were used in the 959 seconds of this rehearsal segment, which was the longest of the five rehearsal segments and contained the most teacher and student behaviors (see Table 15). The teaching cycles used by Teacher A in the

Advanced Choir were similar to those in the Beginning Choir with a student response/feedback ratio of 3:1 for the entire rehearsal (see Table 6).

Feedback was used infrequently in the remaining rehearsal segments and was more general and not as specific as the feedback observed in Rehearsal Segment 2. Rehearsal Segment 4, which had a high rate of 1a and 2p behaviors, had one approval and three disapprovals (see Table 15). During Rehearsal Segments 3 and 4 incomplete teaching cycles were recorded, and teaching cycles that were complete used feedback less frequently than previously. These two rehearsal segments were observed as being more relaxed and less intense than Rehearsal Segment 2. Teacher A demonstrated high intensity teaching behaviors and used complete teaching cycles effectively during Rehearsal Segment 2, the longest and most detailed rehearsal segment.

Table 14 Teacher A – Beginning Choir

CATEGORIES OF BEHAVIOR: FREQUENCY		1o	1a/1d	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1		1	4	3	6	4	0	2	2	12
Rehearsal Segment 2		0	10	2	7	7	0	1	5	15
Rehearsal Segment 3		1	9	2	1	2	1	1	1	9
Rehearsal Segment 4		3	6	3	2	1	1	2	0	10
FREQUENCY OF BEHAVIORS		5	29	10	16	14	2	6	8	46
DURATION IN SECONDS		TOTAL								
Rehearsal Segment 1	834	29	103	143	67	27	0	55	101	495
Rehearsal Segment 2	605	0	191	51	35	93	0	40	10	236
Rehearsal Segment 3	695	29	287	130	16	22	6	29	15	381
Rehearsal Segment 4	746	110	270	166	37	10	12	53	0	298
TOTAL SECONDS	2880	168	851	490	155	152	18	177	126	1410
MEAN DURATION IN SECONDS										
Rehearsal Segment 1		29.00	25.75	47.67	11.17	6.75	0.00	27.50	50.50	41.25
Rehearsal Segment 2		0.00	19.10	25.50	5.00	13.29	0.00	0.00	2.00	15.73
Rehearsal Segment 3		29.00	31.89	65.00	16.00	11.00	6.00	0.00	15.00	42.33
Rehearsal Segment 4		36.67	45.00	55.33	18.50	10.00	12.00	26.50	0.00	29.80
TOTAL REHEARSAL MEAN DURATION IN SECONDS		33.60	29.34	49.00	9.69	10.86	9.00	29.50	15.75	30.65

Table 14 - continued

PERCENTAGE OF EACH BEHAVIOR BY REHEARSAL SEGMENT	1o	1a/1d	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	3.5%	12.4%	17.1%	8.0%	3.2%	0.0%	6.6%	12.1%	59.4%
Rehearsal Segment 2	0.0%	31.6%	8.4%	5.8%	15.4%	0.0%	6.6%	1.7%	39.0%
Rehearsal Segment 3	4.2%	41.3%	18.7%	2.3%	3.2%	0.9%	4.2%	2.2%	54.8%
Rehearsal Segment 4	14.7%	36.2%	22.3%	5.0%	1.3%	1.6%	7.1%	0.0%	39.9%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	5.8%	29.5%	17.0%	5.4%	5.3%	0.6%	6.1%	4.4%	49.0%
normed	4.7%	24.0%	13.8%	4.4%	4.3%	0.5%	5.0%	3.6%	39.8%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	20%	14%	30%	38%	29%	0%	33%	25%	26%
Rehearsal Segment 2	0%	34%	20%	44%	50%	0%	17%	63%	33%
Rehearsal Segment 3	20%	31%	20%	6%	14%	50%	17%	13%	20%
Rehearsal Segment 4	60%	21%	30%	13%	7%	50%	33%	0%	22%

CATEGORIES OF BEHAVIORS: FREQUENCY	1o	1a/1d	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	2	8	7	8	3	0	2	2	20
Rehearsal Segment 2	2	12	1	6	14	5	1	0	34
Rehearsal Segment 3	1	2	0	1	1	0	1	0	3
Rehearsal Segment 4	2	16	2	4	1	3	1	0	24
Rehearsal Segment 5	0	1	0	1	1	0	0	0	1
FREQUENCY OF BEHAVIORS	7	39	10	20	20	8	5	2	82
DURATION IN SECONDS									
Rehearsal Segment 1	20	68	253	81	24	0	42	42	647
Rehearsal Segment 2	34	220	31	35	118	55	12	0	490
Rehearsal Segment 3	32	30	0	9	5	0	32	0	101
Rehearsal Segment 4	42	245	72	75	2	30	38	0	407
Rehearsal Segment 5	0	10	0	3	4	0	0	0	80
TOTAL SECONDS	2937	128	573	356	203	153	85	124	1725
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	10.00	8.50	36.14	10.13	8.00	0.00	21.00	21.00	32.35
Rehearsal Segment 2	17.00	18.33	31.00	5.83	8.43	11.00	0.00	0.00	14.41
Rehearsal Segment 3	32.00	15.00	0.00	9.00	5.00	0.00	0.00	0.00	33.67
Rehearsal Segment 4	21.00	15.31	36.00	18.75	2.00	10.00	38.00	0.00	16.96
Rehearsal Segment 5	0.00	10.00	0.00	3.00	4.00	0.00	0.00	0.00	80.00
TOTAL REHEARSAL MEAN DURATION IN SECONDS	16.00	13.43	20.63	9.34	5.49	4.20	11.80	4.20	35.48

Table 15 Teacher A – Advanced Choir

Table 15 - continued

PERCENTAGE OF EACH BEHAVIOR BY REHEARSAL SEGMENT		1s	1a/1d	1ar	1p	3a	3d	2s	2r	2p
Rehearsal Segment 1	900	2.2%	7.6%	28.1%	9.0%	2.7%	0.0%	4.7%	4.7%	71.9%
Rehearsal Segment 2	959	3.5%	22.9%	3.2%	3.6%	12.3%	5.7%	1.3%	0.0%	51.1%
Rehearsal Segment 3	175	18.3%	17.1%	0.0%	5.1%	2.9%	0.0%	18.3%	0.0%	57.7%
Rehearsal Segment 4	768	5.5%	31.9%	9.4%	9.8%	0.3%	3.9%	4.9%	0.0%	53.0%
Rehearsal Segment 5	135	0.0%	7.4%	0.0%	2.2%	3.0%	0.0%	0.0%	0.0%	59.3%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL		4.6%	20.4%	12.7%	7.2%	5.5%	2.2%	4.4%	1.5%	61.6%
normed		3.8%	16.9%	10.5%	6.0%	4.5%	1.8%	3.6%	1.2%	50.9%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT										
Rehearsal Segment 1		29%	21%	70%	40%	15%	0%	40%	100%	24%
Rehearsal Segment 2		29%	31%	10%	30%	70%	57%	20%	0%	41%
Rehearsal Segment 3		14%	5%	0%	5%	5%	0%	20%	0%	4%
Rehearsal Segment 4		29%	41%	20%	20%	5%	43%	20%	0%	29%
Rehearsal Segment 5		0%	3%	0%	5%	5%	0%	0%	0%	1%

Table 16 Teacher A – Summary: Beginning and Advanced Choir

Teacher A-Beginning

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Behavior	Percentage of time spent in Student Behavior	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	834	18	16	53	47	20	40
Rehearsal Segment 2	605	26	21	55	45	16	9
Rehearsal Segment 3	695	16	11	59	41	26	29
Rehearsal Segment 4	746	16	12	57	43	30	28
Total	2880	76	60	56%	44%	24	25
						18 seconds	
						Not including 1ar	

Teacher A-Advanced

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Behavior	Percentage of time spent in Student Behavior	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	900	28	24	38	62	15	25
Rehearsal Segment 2	959	40	35	49	51	15	14
Rehearsal Segment 3	175	5	4	36	64	15	34
Rehearsal Segment 4	768	28	25	51	49	19	27
Rehearsal Segment 5	135	3	1	13	87	4	80
Total	2937	104	89	37%	63%	14	36
						12 seconds	
						Not including 1ar	

Teacher B: Descriptions of Pacing

Table 17

Teacher B (see also Tables 18-20)

BEGINNING CHOIR-Teacher B			
Structure A	4 RS	Fast/slow/fast	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm	3.10	RS 1 Rpm	2.26
Total Rpm	2.31	Total Rpm	3.45
Mean Duration	22 sec.	Mean Duration	19 sec.
% Time	67%	% Time	34%
Overall Pacing		Slow	
Student Responses/Feedback			
10 approvals/5 disapprovals		Ratio 4:1	

RS=Rehearsal Segment Rpm=Rate per minute

ADVANCED CHOIR-Teacher B			
Structure A	4 RS	Moderately fast/slow/fast	
RS 1 Rpm	1.39	RS 1 Rpm	2.26
Total Rpm	3.72	Total Rpm	2.72
Mean Duration	20 sec.	Mean Duration	38 sec.
% Time	53%	% Time:	47%
Overall Pacing		Moderately Slow	
Student Responses/Feedback			
13 approvals/15 disapprovals		Ratio 2:1	

RS=Rehearsal Segment Rpm=Rate per minute

Beginning Choir: Rehearsal Structure. Structure A is defined as beginning and ending with a fast paced activity with detailed, analytical study in the middle. Teacher B closely followed this structure. The warm up (Rehearsal Segment 1) included exercises of varying tempos and styles, familiar to the students. Students were performing for 50% of the time in the warm up segment with 27 student performance behaviors. Rehearsal Segment 1 was the longest of the four rehearsal segments and lasted 1001 seconds. During this rehearsal segment Teacher B had a high frequency (11) of 1ar behavior (instructions given while students were performing) and used modeling often for short durations (see Table 18). Teacher B's instruction and use of modeling during warm up was focused on breath support, healthy tone, and other elements of good singing.

Rehearsal Segments 2 and 3 involved detailed study of rhythm patterns and sight-reading examples from the District Music Performance Assessment. During both of these segments there was no singing, as students responded verbally at a moderately high rate of 4.98 and 3.09 (see Table 9). Teacher verbal instructions occurred for a total of 791 seconds during the two segments with a mean duration of 50 seconds. Long durations and a low teacher rate per minute (1.56 and 1.98) for these rehearsal segments indicate slow pacing. The final Rehearsal Segment 4 involved the students in singing a piece with a fast tempo and included frequent alternations of behaviors that moved the rate per minute higher for teacher and student behaviors. Students were observed to be on-task and highly attentive, but were more relaxed and enthusiastic during this final

rehearsal segment. This rehearsal followed the fast-slow-fast model of Structure A.

Beginning Choir: Frequency. Rates per minute and durations of behaviors were consistent with slower pacing. Rehearsal Segment 1 recorded a teacher rate per minute of 3.1, which was slightly over the mean of 2.94 for all ten rehearsals. The other three rehearsal segments were below the mean in rate per minute. During Rehearsal Segments 2 and 3 the mean duration for teacher behaviors was 28 seconds. Student rates per minute during Rehearsal Segments 2 and 3 were consistently higher than the mean rate per minute of 3.04 and students mean durations were 12 seconds and 19 seconds. These durations and rates indicate that students were given frequent opportunities to respond, their responses were short in length, however the teacher instructions were lengthy and consistent with slower pacing.

Length of the final rehearsal segment was 593 seconds and students were singing for 256 seconds (see Tables 20 and 22). Teacher behaviors showed longer durations than student behaviors due to 1ar behavior that was demonstrated during this rehearsal segment for 114 seconds. For the total rehearsal teacher behaviors were observed 67% of the time and the rates per minute and durations seemed to indicate slow pacing.

Beginning Choir: Direct Instruction. Teacher B showed a low frequency of feedback behaviors, with a ratio of 4:1 student response to feedback statements (10 approvals and 5 disapprovals) observed during this rehearsal (see Table 18). The low number of approvals and disapprovals resulted in occasional incomplete

teaching cycles, using descriptions from Direct Instruction studies. However, observations of the rehearsal indicate that many of the 1a behaviors were academic instruction that may have functioned as corrective feedback.

Advanced Choir: Rehearsal Structure. Structure A was again used by Teacher B. Rehearsal Segments 1 and 2 were warm up activities, the first using rhythm patterns, chanted and/or clapped. Rehearsal Segment 2 was a vocal warm up, similar in structure to the Beginning Choirs' warm up, and functioned as a group voice lesson. Teacher B modeled less in this segment (1p) but used 1ar behaviors extensively during Rehearsal Segments 2, 3, and 4. Rehearsal Segment 3 was 1215 seconds in duration, or 41% of the rehearsal. During this time students studied sight-reading examples from the MPA booklet. The final rehearsal segment of 474 seconds was a brief, but fast paced rehearsal of the spiritual "Hold On" (see Table 20). This rehearsal adhered to the Cox Structure A, beginning and ending with faster paced activities.

Advanced Choir: Frequency. The rates per minute and durations for the rehearsal were consistent with slower pacing. Rehearsal Segments 1, 2, and 3 recorded lower than the mean rates for teacher and student behaviors (see Table 9). The rate of student response during the drill portion of this rehearsal was lower than the rate in the beginning choir, which indicated that the teacher may have felt the maturity of the group did not require as much alternation to maintain attentiveness. Student mean durations during Rehearsal Segment 3 were 38 seconds. The high frequency of 1ar behaviors (20 behaviors) and lengthy durations of 1ar, 843 seconds or 23% of the total rehearsal, that were recorded

show that instruction and feedback were being given during the lengthy drill. Rehearsal Segment 4, the rehearsal of the spiritual, recorded a much higher rate per minute with a teacher rate of 4.7 and student rate of 3.6, higher than the mean rate for all advanced choirs. After the slower paced and detailed study of Rehearsal Segments 2 and 3, the final Rehearsal Segment 4 demonstrated a much faster pace.

Advanced Choir: Direct Instruction. Feedback was given at a higher rate than with beginning choir. More disapprovals (15) were used than approvals (13) and were observed during all rehearsal segments. Teaching cycles were more complete than incomplete with feedback used more frequently than with the Beginning Choir. The disapprovals used in the rehearsal were observed to be corrective and never harsh or sarcastic and did not appear to negatively affect the attitude of the students. Students were observed as focused and on-task throughout the rehearsal.

Observations of Teacher B demonstrated teacher attributes that were consistent with high magnitude teaching and also are shown to be consistent with teachers who use Cox Structure A. Directors who use this structure have been shown to be stimulating and enthusiastic toward music, which may be necessary to achieve results during concentrated and analytical study. Rehearsal Segments 2 and 3 of the Beginning Choir and Rehearsal Segment 3 of the Advanced Choir were repetitive drill and detailed study. High magnitude attributes, such as varying voice patterns, moving around the room, high approval rate, and constant use of eye contact may have contributed to Teacher

B maintaining a successful rehearsal even during tedious or repetitious drill (Yarbrough, 1998). As less enjoyable activities are sometimes necessary, it appears helpful that teachers be aware of the need for teaching strategies demonstrating high intensity especially during less enjoyable activities.

The “mini-rehearsals” found in the final rehearsal segments of Teacher B may be more typical of the pacing for Teacher B during a rehearsal that spends more time with choral literature. Teacher and student rates per minute of 4.72 and 3.59 and durations of behaviors under 20 seconds, indicate that this rehearsal segment demonstrated Teacher B’s fastest pacing. Students had maintained high on-task behaviors throughout this rehearsal, but were obviously more relaxed and enthusiastic during the final rehearsal segment. The final rehearsal segment may have functioned as approval feedback for the choir maintaining attentiveness and working hard! These rehearsals followed closely the fast-slow-fast model of Structure A.

Table 18 Teacher B – Beginning Choir

CATEGORIES OF BEHAVIOR: FREQUENCY	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	1	13	11	9	1	2	0	9	18
Rehearsal Segment 2	0	11	4	2	4	1	0	19	0
Rehearsal Segment 3	0	5	0	0	3	1	0	5	0
Rehearsal Segment 4	1	8	1	6	2	1	0	3	14
FREQUENCY OF BEHAVIORS	2	37	16	17	10	5	0	36	32
DURATION IN SECONDS									
Rehearsal Segment 1	57	209	401	37	6	7	0	241	476
Rehearsal Segment 2	0	635	119	32	42	18	0	229	0
Rehearsal Segment 3	0	156	0	0	103	14	0	97	0
Rehearsal Segment 4	33	221	114	31	35	4	0	38	256
TOTAL SECONDS	90	1221	634	100	186	43	0	567	732
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	57.00	16.08	36.45	4.11	6.00	3.50	0.00	26.78	26.44
Rehearsal Segment 2	0.00	57.73	29.75	16.00	10.50	18.00	0.00	12.05	0.00
Rehearsal Segment 3	0.00	31.20	0.00	0.00	34.33	14.00	0.00	19.40	0.00
Rehearsal Segment 4	33.00	27.63	114.00	5.17	17.50	4.00	0.00	12.67	18.29

PERCENTAGE OF EACH BEHAVIOR FOR
THE TOTAL REHEARSAL

	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	5.7%	20.9%	40.1%	3.7%	0.6%	0.7%	0.0%	24.1%	47.6%
Rehearsal Segment 2	0.0%	66.3%	12.4%	3.3%	4.4%	1.9%	0.0%	23.9%	0.0%
Rehearsal Segment 3	0.0%	45.0%	0.0%	0.0%	29.7%	4.0%	0.0%	28.0%	0.0%
Rehearsal Segment 4	5.6%	37.3%	19.2%	5.2%	5.9%	0.7%	0.0%	6.4%	43.2%

PERCENTAGE OF EACH BEHAVIOR FOR
THE TOTAL REHEARSAL

normed

	3.1%	42.1%	21.9%	3.4%	6.4%	1.5%	0.0%	19.6%	25.3%
normed	2.5%	34.2%	17.8%	2.8%	5.2%	1.2%	0.0%	15.9%	20.6%

PERCENTAGE OF TOTAL BEHAVIORS
FOUND IN EACH REHEARSAL SEGMENT

Rehearsal Segment 1	50%	35%	69%	53%	10%	40%	0%	25%	56%
Rehearsal Segment 2	0%	30%	25%	12%	40%	20%	0%	53%	0%
Rehearsal Segment 3	0%	14%	0%	0%	30%	20%	0%	14%	0%
Rehearsal Segment 4	50%	22%	6%	35%	20%	20%	0%	8%	44%

Table 18 - continued

Table 19 Teacher B – Advanced Behavior

CATEGORIES OF BEHAVIOR: FREQUENCY	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	1	5	3	0	1	0	1	5	1
Rehearsal Segment 2	1	7	8	2	5	9	0	1	26
Rehearsal Segment 3	5	7	8	1	4	5	1	9	7
Rehearsal Segment 4	3	4	1	2	3	1	0	1	9
FREQUENCY OF BEHAVIORS	10	23	20	5	13	15	2	16	43
DURATION IN SECONDS									
Rehearsal Segment 1	171	119	133	0	18	0	171	238	23
Rehearsal Segment 2	8	95	230	9	70	76	0	3	668
Rehearsal Segment 3	236	144	460	10	43	125	12	485	332
Rehearsal Segment 4	55	56	20	18	25	4	0	20	147
TOTAL SECONDS	470	414	843	37	156	205	183	726	1170
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	171.00	23.80	44.33	0.00	18.00	0.00	171.00	47.60	23.00
Rehearsal Segment 2	8.00	13.57	28.75	4.50	14.00	8.44	0.00	3.00	25.69
Rehearsal Segment 3	47.20	20.57	0.00	10.00	10.75	25.00	12.00	53.89	47.43
Rehearsal Segment 4	18.33	14.00	20.00	9.00	8.33	4.00	0.00	20.00	16.33
TOTAL REHEARSAL MEAN DURATION IN SECONDS	47.00	18.00	42.15	7.40	12.00	13.67	91.50	45.38	27.21

Table 19 - continued

PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	32.6%	22.7%	25.4%	0.0%	3.4%	0.0%	32.6%	45.4%	4.4%
Rehearsal Segment 2	1.0%	12.3%	29.8%	1.2%	9.1%	9.9%	0.0%	0.4%	86.6%
Rehearsal Segment 3	19.4%	11.9%	37.9%	0.8%	3.5%	10.3%	1.0%	39.9%	27.3%
Rehearsal Segment 4	11.6%	11.8%	4.2%	3.8%	5.3%	0.8%	0.0%	4.2%	31.0%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	15.8%	13.9%	28.3%	1.2%	5.2%	6.8%	6.1%	24.3%	39.2%
normed	12.8%	11.3%	23.0%	1.0%	4.2%	5.5%	5.0%	19.8%	31.9%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	10%	22%	15%	0%	8%	0%	50%	31%	2%
Rehearsal Segment 2	10%	30%	40%	40%	38%	60%	0%	6%	60%
Rehearsal Segment 3	50%	30%	40%	20%	31%	33%	50%	56%	16%
Rehearsal Segment 4	30%	17%	5%	40%	23%	7%	0%	6%	21%

Teacher B-Beginning

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	1001	37	27	50	50	24	27
Rehearsal Segment 2	958	22	19	79	21	28	12
Rehearsal Segment 3	347	9	5	74	26	27	19
Rehearsal Segment 4	593	19	17	63	37	34	18
Total	2899	87	68	67%	34%	28	19
						22 seconds	
						Not including 1ar	

Teacher B-Advanced

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	524	12	7	53	47	55	81
Rehearsal Segment 2	771	36	27	50	50	18	14
Rehearsal Segment 3	1215	30	17	55	45	29	38
Rehearsal Segment 4	474	14	10	55	45	15	18
Total	2984	92	61	53%	47%	29	38
						20 seconds	
						Not including 1ar	

Teacher C: Descriptions of Pacing

Table 21

Teacher C (see also Tables 22-24)

BEGINNING CHOIR-Teacher			
Structure C	4 RS	Alternates activities	
Teacher Behaviors		Student Behaviors	
RS 1 pm:	2.39	RS 1 Rpm:	1.79
Total Rpm:	3.45	Rpm:	3.79
Mean Duration	14 sec.	Mean Duration	16 sec.
% Time	53%	% Time	47%
Overall Pacing		Moderately Slow	
Student Responses/Feedback		Ratio 5:1	
4 approvals/14 disapprovals			

RS=Rehearsal Segment Rpm=Rate per minute

ADVANCED CHOIR-Teacher C			
Structure C	4 RS	Alternates fast/slow/fast/slow	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm:	3.37	RS 1 Rpm:	2.25
Rpm	3.42	Rpm	2.93
Mean Duration	12 sec.	Mean Duration	20 sec.
% Time	53%	% Time	47%
Overall Pacing		Moderately Fast	
Student Responses/Feedback		Ratio 5:1	
5 approvals/8 disapprovals			

RS=Rehearsal Segment Rpm=Rate per minute

Beginning Choir: Rehearsal Structure. Teacher C alternated tempos and styles, accompanied and unaccompanied, all activities consistent with Structure C. Rehearsal Segment 1 recorded 1584 seconds, or 49% of the total rehearsal. During this extensive warm up period, many different exercises and familiar songs were used, both accompanied and unaccompanied. Twelve 1ar behaviors totaling 459 seconds were observed during the 882 seconds of student performance (see Table 22). Rehearsal Segment 2 was a short (280 seconds) rehearsal of a slow, unison, and accompanied piece. During the following rehearsal segments students rehearsed a piece with a much faster tempo and concluded with an arrangement of Dona Nobis Pacem, slow and accompanied.

Beginning Choir: Frequency. Behaviors in Rehearsal Segment 1 alternated at a low rate per minute (see Table 9). The student rate per minute for Rehearsal Segment 1 was 1.79 and the low rate during the lengthy segment may have contributed to student off-task and low attentiveness observed during this rehearsal segment. Durations for Rehearsal Segment 1 were short for teacher instruction (1a = 13 seconds) but the student rates for response (2r = 35 seconds) and performing (2p = 34 seconds) was very high. Teacher C made extensive use of 1ar behaviors during this rehearsal segment for a mean duration of 38 seconds. The rates and durations were consistent with slow pacing during the first rehearsal segment.

Rehearsal Segment 2 had rates per minute recorded at 4.98 for student behaviors and mean durations of 13 seconds. Students changed activities more often and durations were shorter. The rehearsal segment of 280 seconds was

consistent with faster pacing models and the students also were observed as more on-task and attentive. Rehearsal Segments 3 and 4 maintained a high rate per minute for teacher and student behaviors and the durations remained short and consistent with fast-pacing.

Beginning Choir: Direct Instruction. Feedback was observed at a low rate for the entire rehearsal. Four approvals and thirteen disapprovals were recorded (see Table 20). Teaching cycles were incomplete for most of the first rehearsal segment. Recorded disapprovals were usually corrective and aimed at academic behaviors, however three disapprovals were directed towards student social behaviors. Low student on-task and attentiveness has been associated with high rates of disapprovals and low rates of approvals, and may have contributed to the observed student social behaviors. Teaching cycles in later rehearsal segments were more complete. Disapprovals used by Teacher C were observed as matter of fact and not punishing and may have functioned as corrective feedback.

The overall rehearsal of Teacher C-Beginning Choir demonstrated a mean duration of teacher behaviors of 17 seconds, and student mean duration of 22 seconds, consistent with slow and moderately slow pacing. Rehearsal Segment 1 showed rates, durations, and use of feedback consistent with low ratings of slow pacing. Rehearsal Segments 2, 3, and 4 were more consistent with higher ratings and faster pacing as the rates per minute were higher, durations lower, and more complete teaching patterns used.

Teacher C demonstrated high energy and enthusiasm; varied speech patterns, and frequently moved around the classroom. Observations recorded that eye contact with students was demonstrated at a low level for much of the rehearsal. Lack of eye contact along with a low level of feedback may have contributed to the lack of attentiveness by some students.

Advanced Choir: Rehearsal Structure. Teacher C followed Structure C in the Advanced Choir rehearsal and showed more balance in the rehearsal segments than in the Beginning Choir rehearsal (see Tables 4 & 5). Tempos and literature difficulty were varied as suggested by Structure C. Rehearsal Segment 1 was slightly longer than the other three rehearsal segments, but lasted only 916 seconds, or 32% of the rehearsal. During warm ups the students were positioned standing around the room. The circumambient position allowed students to hear each other and to use motions to enhance their warm up. Students were observed as attentive and on-task for much of the rehearsal segment. Rehearsal Segment 2 was a slow-tempo a cappella piece in French, Rehearsal Segment 3 introduced a fast piece, also in a language, and the final rehearsal segment was an accompanied, slow-tempo piece. An accompanist was present after the first rehearsal segment. Teacher and student rates per minute were consistent (see Table 9) and near the median in this rehearsal, which maintained an even paced, progressive flow. No specific closure activity was used, but the choir sang for longer durations as the rehearsal drew to a close.

Advanced Choir: Frequency. The mean rate per minute of 3.42 for Teacher C was close to the mean rate of 3.53 for all subjects in advanced choir rehearsals. The student rates varied from 2.25 to 3.74, but were slightly above the total mean of 2.74 for the students in advanced choirs. The mean duration of teacher behaviors was 12 seconds, consistent with higher ratings of fast paced rehearsals. Student means durations were recorded as 20 seconds. The student durations during Rehearsal Segments 2 and 3 were shorter, indicating more alternation of activity and more consistent with faster pacing (see Table 23).

Advanced Choir: Direct Instruction. Feedback was used at a low level in the rehearsal resulting in incomplete teaching cycles. Five approvals and eight disapprovals were recorded, which was the lowest frequency of feedback of the ten observed rehearsals. Frequent alternation of activities, and durations consistent with fast pacing and effective teaching were observed, but the lack of feedback resulted in incomplete teaching cycles for much of the rehearsal. Use of sequential patterns has been identified with higher musical achievement. Observations of these advanced students' performance behaviors indicated they did not self-correct, which suggests that more specific feedback would be useful in improving student achievement.

Students demonstrated few off-task behaviors, and were observed as more attentive than the Beginning Choir. Factors that may have contributed to the higher attentiveness included closer proximity to the teacher (room was arranged differently during this rehearsal), enthusiastic manner of the teacher, maturity of the class, and the smaller number of students in the class.

Table 22 Teacher C – Beginning Choir

CATEGORIES OF BEHAVIOR:	1s	1a	1ar	1p	3a	3d	2s	2r	2p
FREQUENCY									
Rehearsal Segment 1	5	7	5	8	0	2	2	9	18
Rehearsal Segment 2	3	14	2	1	2	1	2	1	16
Rehearsal Segment 3	1	14	0	0	2	2	2	0	18
Rehearsal Segment 4	3	13	3	2	1	3	0	0	17
FREQUENCY OF BEHAVIORS	12	48	10	11	5	8	6	10	69
DURATION IN SECONDS									
Rehearsal Segment 1	46	97	202	39	0	14	13	275	485
Rehearsal Segment 2	18	195	60	4	29	8	71	30	278
Rehearsal Segment 3	43	255	0	0	43	23	43	0	243
Rehearsal Segment 4	27	237	124	63	10	12	0	0	377
TOTAL SECONDS	134	784	386	106	82	57	127	305	1383
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	9.20	13.86	40.40	4.88	0.00	7.00	6.50	30.56	26.94
Rehearsal Segment 2	6.00	13.93	30.00	4.00	14.50	8.00	35.50	30.00	17.38
Rehearsal Segment 3	43.00	18.21	0.00	0.00	21.50	11.50	21.50	0.00	13.50
Rehearsal Segment 4	9.00	18.23	41.33	31.50	10.00	4.00	0.00	0.00	22.18
TOTAL REHEARSAL MEAN DURATION IN SECONDS	11.17	16.33	38.60	9.64	16.40	7.13	21.17	30.50	20.04

Table 22 – continued

PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	8.4%	10.7%	29.0%	2.7%	0.3%	4.2%	2.5%	22.3%	55.7%
Rehearsal Segment 2	3.2%	41.4%	0.0%	2.9%	6.1%	3.2%	3.2%	0.0%	51.8%
Rehearsal Segment 3	15.6%	27.8%	9.6%	2.1%	2.4%	4.2%	6.3%	3.9%	39.5%
Rehearsal Segment 4	3.8%	36.5%	7.0%	6.6%	2.8%	2.4%	0.6%	0.0%	43.6%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	9.1%	21.9%	18.0%	3.2%	1.7%	3.8%	3.3%	12.1%	49.2%
normed	7.4%	17.8%	14.6%	2.6%	1.4%	3.1%	2.7%	9.8%	40.0%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	29%	33%	63%	38%	25%	27%	29%	77%	35%
Rehearsal Segment 2	7%	15%	0%	6%	25%	18%	14%	0%	15%
Rehearsal Segment 3	43%	26%	26%	38%	25%	36%	43%	23%	31%
Rehearsal Segment 4	21%	26%	11%	19%	25%	18%	14%	0%	20%

Table 23 Teacher C – Advanced Choir

CATEGORIES OF BEHAVIOR: FREQUENCY	1s	1a	1ar	1p	3a	3d	2s	2r	2p
Rehearsal Segment 1	5	7	5	8	0	2	2	9	18
Rehearsal Segment 2	3	14	2	1	2	1	2	1	16
Rehearsal Segment 3	1	14	0	0	2	2	2	0	18
Rehearsal Segment 4	3	13	3	2	1	3	0	0	17
FREQUENCY OF BEHAVIORS	12	48	10	11	5	8	6	10	69
DURATION IN SECONDS									
Rehearsal Segment 1	46	97	202	39	0	14	13	275	485
Rehearsal Segment 2	18	195	60	4	29	8	71	30	278
Rehearsal Segment 3	43	255	0	0	43	23	43	0	243
Rehearsal Segment 4	27	237	124	63	10	12	0	0	377
TOTAL SECONDS	134	784	386	106	82	57	127	305	1383
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	9.20	13.86	40.40	4.88	0.00	7.00	6.50	30.56	26.94
Rehearsal Segment 2	6.00	13.93	30.00	4.00	14.50	8.00	35.50	30.00	17.38
Rehearsal Segment 3	43.00	18.21	0.00	0.00	21.50	11.50	21.50	0.00	13.50
Rehearsal Segment 4	9.00	18.23	41.33	31.50	10.00	4.00	0.00	0.00	22.18
TOTAL REHEARSAL MEAN DURATION IN SECONDS	11.17	16.33	38.60	9.64	16.40	7.13	21.17	30.50	20.04

Table 23 - continued

PERCENTAGE OF EACH BEHAVIOR BY REHEARSAL SEGMENT	1s/1d	1a	1ar	1p	3a	3d	2s	2r	2p
Rehearsal Segment 1	5.0%	10.6%	22.1%	4.3%	0.0%	1.5%	1.4%	30.0%	52.9%
Rehearsal Segment 2	2.9%	31.3%	9.6%	0.6%	4.6%	1.3%	11.4%	4.8%	44.6%
Rehearsal Segment 3	7.4%	43.7%	0.0%	0.0%	7.4%	3.9%	7.4%	0.0%	41.7%
Rehearsal Segment 4	3.6%	31.4%	16.4%	8.3%	1.3%	1.6%	0.0%	0.0%	49.9%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	4.7%	27.2%	13.4%	6.0%	2.8%	2.0%	4.4%	10.6%	48.1%
normed	3.9%	22.9%	11.3%	5.0%	2.4%	1.7%	3.7%	8.9%	40.4%
PERCENTAGE OF TOAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	42%	15%	50%	73%	0%	25%	33%	90%	26%
Rehearsal Segment 2	25%	29%	20%	9%	40%	13%	33%	10%	23%
Rehearsal Segment 3	8%	29%	0%	0%	40%	25%	33%	0%	26%
Rehearsal Segment 4	25%	27%	30%	18%	20%	38%	0%	0%	25%

Table 24 Teacher C Summary – Beginning and Advanced Choir

Teacher C-Beginning

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	1584	43	38	53%	47%	19	30
Rehearsal Segment 2	280	11	12	48%	52%	15	13
Rehearsal Segment 3	826	34	29	54%	46%	15	12
Rehearsal Segment 4	498	21	16	57%	43%	12	9
Total	3188	109	95	53%	47%	15	16
						14 seconds	
						Not including 1ar	

Teacher C-Advanced

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	916	29	29	50%	50%	17	27
Rehearsal Segment 2	624	23	19	55%	45%	11	17
Rehearsal Segment 3	583	19	20	49%	51%	24	14
Rehearsal Segment 4	755	25	17	60%	40%	19	22
Total	2878	96	85	53%	47%	18	20
						12 seconds	
						Not including 1ar	

Teacher D: Descriptions of Pacing

Table 25

Teacher D (see also Tables 26-28)

BEGINNING CHOIR-Teacher D			
Structure C	5 RS	Fast/slow/fast/slow/slow	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm	7.68	RS 1 Rpm	4.86
Rpm	3.43	Rpm	2.6
Mean Duration	14 sec.	Mean Duration	31 sec.
% Time	54%	% Time	46%
Overall Pacing		Fast	
Student Responses/Feedback 19 approvals/2 disapprovals		Ratio 3.5:1	

RS=Rehearsal Segment Rpm=Rate per minute

ADVANCED CHOIR-Teacher D			
Structure A/B	4 RS	Slower/fast/slower	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm	3.56	RS 1 Rpm	.45
Rpm	4.67	Rpm	.94
Mean Duration	13 sec.	Mean Duration	22 sec.
% Time	53%	% Time	47%
Overall Pacing		Moderately Fast	
Student Responses/Feedback 24 approvals/7 disapprovals		Ratio 3:1	

RS=Rehearsal Segment Rpm=Rate per minute

Beginning Choir: Rehearsal Structure. Teacher D followed Structure C in the Beginning Choir rehearsal. The five rehearsal segments were divided unevenly with 80% of the total rehearsal in Rehearsal Segments 1, 2, and 3 (see Tables 4 & 5). The rehearsal was varied with easy and difficult, familiar and unfamiliar literature of varying tempos; consistent with Structure C. Rehearsal Segment 1 had the highest rate per minute of any observed rehearsal segment (see Table 9). Teacher D used quick responses, frequent changes, and used a rapid speech pattern. Effective use of vocal techniques and prescriptive feedback, much like a group voice lesson, was observed as the teacher addressed tone and resonance throughout the lesson. A trained accompanist was present throughout the rehearsal.

Rehearsal Segment 2 used a slow tempo accompanied piece in the developmental stages. While the rate per minute is much lower (3.2) than the previous rehearsal segment, the rate is still near the mean for the five observed teachers. A fast piece, fairly familiar, was used during Rehearsal Segment 3. At that point about ten minutes remained in the rehearsal and Teacher D changed to a much slower pace. Rehearsal Segment 4 had the lowest rate of change as the choir sang through a slow, short familiar piece and then with about three minutes remaining, Teacher D used the final rehearsal segment of 125 seconds for sight-reading a portion of new piece scheduled for the next day's rehearsal. These two pieces functioned as closure activities. The varied pace of behaviors and varying styles of literature were consistent with Structure C.

Beginning Choir: Frequency. The rate per minute of teacher and student behaviors was the highest of any recorded Rehearsal Segment 1. The teacher rate of 7.68 changes per minute and student rate of 4.86 demonstrated fast pacing, with many and frequent opportunities for performance (see Table 9). The short durations of teacher instruction (1a) was consistent with very high ratings of fast pacing. All durations of behaviors during Rehearsal Segment 1 were short, under 13 seconds. Teacher D showed high teacher intensity and demonstrated enthusiasm throughout the rehearsal. The unusually high rate per minute in the initial period worked especially well to move a talkative group of young high school students into a more attentive group. This class accommodates late arrival of special needs students in wheelchairs. Instead of letting their arrival slow the group's rehearsal pace, the teacher never paused, but allowed aides and other students to assist them in joining the class.

Mean durations of teacher behaviors were 21 seconds, including 1ar behaviors, and 14 seconds excluding 1ar behaviors. Student mean duration was 14 seconds. The rate per minute demonstrated clearly that when Teacher D was giving instruction the pacing was fast. The rate dropped when a "sing through" method was being used (see Table 9). In identifying slow or fast paced rehearsals, it is important to note what kind of activity was occurring and where it occurred in rehearsal structure. This rehearsal could be an example of a high intensity teacher using fast pacing, with slower paced closure activities.

Beginning Choir: Direct Instruction. Rehearsal Segments 1, 2, and 3 used complete teaching cycles and used specific feedback effectively. Approvals

exceeded disapprovals (19:2) during these rehearsal segments (see Table 6). During the closure activities, no feedback was given, but most of the teacher off-task (1o) occurred. Feedback was specific and gave corrective and prescriptive information to the students.

During Rehearsal Segment 2, feedback was used at even a higher rate than the previous example. Behaviors were quickly changed and durations were short. Disapprovals were given only twice during this rehearsal and both were academic and corrective. Social disapprovals were not used even when observations showed students off-task. Participation was high, but students were talkative and were observed talking while instruction and feedback were being given.

Advanced Choir: Rehearsal Structure. Teacher D-Advanced Choir used a combination Structure A/B. The structure of this rehearsal was similar to structure B with an intense, detailed rehearsal with high rates per minute and short durations, building to a climax two-thirds into the rehearsal (see Table 9). Slightly slower paced activities were reported during the first and final rehearsal segments and the slower/fast/slower structure could be interpreted as Structure A. After the shortest warm-up rehearsal segment of any of the observed rehearsals (see Tables 4 & 5), Rehearsal Segment 2 contained the most unfamiliar music and involved detailed, analytical work. This rehearsal segment showed a high rate per minute of behaviors. This was followed by an accompanied piece the students were working to memorize which also recorded a high rate per minute consistent with fast pacing. The final piece was a fast-

tempo piece they were polishing and obviously enjoyed singing from memory, which slowed the rate per minute (see Table 9).

This rehearsal had an unusual balance of time spent in the 4 rehearsal segments: 10%, 20%, 30%, and 40% (see Tables 4 & 5). The rehearsal organization suggests Structure B, with the forward progression towards a two-thirds into the rehearsal climax. The rate per minute of teacher behaviors was a high 4.83 during Rehearsal Segment 2 and peaked at 6.15 during Rehearsal Segment 3 (see Table 9). The high rates and detailed work of Rehearsal Segments 2 and 3 would indicate Structure B. Directors who use Structure B have been described as more patient than directors using other structures, and Teacher D exhibited personal attributes of high energy, enthusiasm, and patience.

Advanced Choir: Frequency. High rates per minute of activity change were the highest observed in the study (see Tables 13 & 29). Teacher D exhibited high off-task, social talk. The mean duration of teacher behaviors was 14 seconds with 133 seconds of 10 behaviors recorded. Using only instructional and feedback behaviors the mean duration was 11 seconds. Student performance mean duration was 13 seconds. This is consistent with highly rated fast pacing. Two behaviors that most affect the pace of the lesson, teacher instruction and student performance, were consistently recorded with high rates per minute and short durations. These two behaviors accounted for 66% of the rehearsal time (see Table 27).

Advanced Choir: Direct Instruction. Feedback was used in complete sequential patterns at a high rate throughout this rehearsal. Approvals and disapprovals totaled 31 behaviors with a ratio of 3:1. The teaching cycles in this rehearsal follow consistently with sequential patterns recommended by Direct Instruction studies and demonstrated by expert teachers. The fast pacing, rapid speech pattern, and overall enthusiasm for teaching contribute to the teacher exhibiting behaviors consistent with high rated excerpts in previous studies. While maintaining a highly positive atmosphere, specific feedback was used at a high rate and Teacher D efficiently demonstrated effective use of direct instruction model.

CATEGORIES OF BEHAVIOR:
FREQUENCY

	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	1	20	2	6	6	1	1	0	28
Rehearsal Segment 2	3	16	1	4	8	1	4	3	19
Rehearsal Segment 3	2	13	1	3	5	0	3	2	18
Rehearsal Segment 4	1	3	0	1	0	0	2	0	2
Rehearsal Segment 5	1	1	0	1	0	0	1	0	2
FREQUENCY OF BEHAVIORS	8	53	4	15	19	2	11	5	69
DURATION IN SECONDS									
Rehearsal Segment 1	12	162	38	42	28	5	12	0	355
Rehearsal Segment 2	38	329	79	56	79	10	85	94	310
Rehearsal Segment 3	62	215	33	24	34	0	95	111	339
Rehearsal Segment 4	65	125	72	60	0	0	114	0	51
Rehearsal Segment 5	50	10	0	13	0	0	50	0	75
TOTAL SECONDS	227	841	222	195	141	15	356	205	1130
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	12.00	8.10	19.00	7.00	4.67	5.00	12.00	0.00	12.68
Rehearsal Segment 2	12.67	20.56	79.00	14.00	9.88	10.00	21.25	31.33	16.32
Rehearsal Segment 3	31.00	16.54	33.00	8.00	6.80	0.00	31.67	55.50	18.83
Rehearsal Segment 4	65.00	41.67	0.00	60.00	0.00	0.00	57.00	0.00	25.50
Rehearsal Segment 5	50.00	10.00	0.00	13.00	0.00	0.00	50.00	0.00	37.50
TOTAL REHEARSAL MEAN DURATION IN SECONDS	34.13	19.37	26.20	20.40	4.27	3.00	34.38	17.37	22.17

Table 26 Teacher D – Beginning Choir

Table 26 - continued

PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	2.0%	27.0%	6.3%	7.0%	4.7%	0.8%	2.0%	0.0%	59.0%
Rehearsal Segment 2	3.6%	31.0%	7.5%	5.3%	7.5%	0.9%	8.0%	8.9%	29.4%
Rehearsal Segment 3	8.0%	28.0%	4.3%	3.1%	4.4%	0.0%	12.3%	14.4%	43.9%
Rehearsal Segment 4	18.0%	34.6%	19.9%	16.6%	0.0%	0.0%	31.6%	0.0%	14.1%
Rehearsal Segment 5	25.4%	5.1%	16.6%	6.6%	0.0%	0.0%	25.4%	0.0%	38.1%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	7.6%	28.1%	7.4%	6.5%	4.7%	0.5%	11.9%	6.9%	37.8%
normed	6.8%	25.2%	6.6%	5.8%	4.2%	0.4%	10.7%	6.2%	33.9%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	13%	38%	50%	40%	32%	50%	9%	0%	41%
Rehearsal Segment 2	38%	30%	25%	27%	42%	50%	36%	60%	28%
Rehearsal Segment 3	25%	25%	25%	20%	26%	0%	27%	40%	26%
Rehearsal Segment 4	13%	6%	0%	7%	0%	0%	18%	0%	3%
Rehearsal Segment 5	13%	2%	0%	7%	0%	0%	9%	0%	3%

Table 27 Teacher D – Advanced Choir

CATEGORIES OF BEHAVIOR: FREQUENCY	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	2	4	1	1	2	2	2	0	6
Rehearsal Segment 2	1	13	1	3	6	0	1	4	18
Rehearsal Segment 3	1	20	2	4	9	3	0	5	30
Rehearsal Segment 4	4	25	1	5	7	2	1	3	33
FREQUENCY OF BEHAVIORS	8	62	5	13	24	7	4	12	87
DURATION IN SECONDS									
Rehearsal Segment 1	43	43	36	18	48	14	44	0	152
Rehearsal Segment 2	21	171	6	52	48	0	30	49	191
Rehearsal Segment 3	6	218	32	41	60	36	0	59	438
Rehearsal Segment 4	133	340	7	49	94	16	53	30	484
TOTAL SECONDS	203	772	81	160	250	66	127	138	1265
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	21.50	10.75	36.00	18.00	24.00	7.00	22.00	0.00	25.33
Rehearsal Segment 2	21.00	13.15	6.00	17.33	8.00	0.00	30.00	12.25	10.61
Rehearsal Segment 3	6.00	10.90	16.00	10.25	6.67	12.00	0.00	11.80	14.60
Rehearsal Segment 4	33.25	13.60	7.00	9.80	13.43	8.00	53.00	10.00	14.67
TOTAL REHEARSAL MEAN DURATION IN SECONDS	25.38	12.45	16.20	12.31	10.42	9.43	31.75	11.50	14.54

Table 27 - continued

PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	14.5%	14.5%	12.2%	6.1%	16.2%	4.7%	14.9%	0.0%	51.4%
Rehearsal Segment 2	3.6%	29.5%	1.0%	9.0%	8.3%	0.0%	5.2%	8.4%	32.9%
Rehearsal Segment 3	0.7%	25.2%	3.7%	4.7%	6.9%	4.2%	0.0%	6.8%	50.6%
Rehearsal Segment 4	11.5%	29.5%	0.6%	4.2%	8.2%	1.4%	4.6%	2.6%	42.0%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL									
	7.0%	26.7%	2.8%	5.5%	8.6%	2.3%	4.4%	4.8%	43.7%
normed	6.6%	25.2%	2.6%	5.2%	8.1%	2.2%	4.2%	4.5%	41.2%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	25%	6%	20%	8%	8%	29%	50%	0%	7%
Rehearsal Segment 2	13%	21%	20%	23%	25%	0%	25%	33%	21%
Rehearsal Segment 3	13%	32%	40%	31%	38%	43%	0%	42%	34%
Rehearsal Segment 4	50%	40%	20%	38%	29%	29%	25%	25%	38%

Teacher D-Beginning

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	602	37	30	55%	45%	9	12
Rehearsal Segment 2	1056	34	27	56%	44%	24	23
Rehearsal Segment 3	772	26	23	53%	47%	25	35
Rehearsal Segment 4	361	5	4	56%	44%	33	44/26*
Rehearsal Segment 5	197	4	3	57%	43%	24	43/38*
Total	2988	106	87	54%	46%	23	31
						19 seconds not including 1ar	27 seconds not including 2o
						14 seconds not including 1ar/1o	* excludes 2o

Teacher D-Advanced

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	296	12	8	60%	40%	20	24
Rehearsal Segment 2	580	24	23	51%	49%	13	18/11*
Rehearsal Segment 3	866	37	35	51%	49%	10	13
Rehearsal Segment 4	1153	44	38	54%	46%	19	34/12*
Total	2895	117	104	53%	47%	16	22
						13 seconds not including 1ar	15 seconds not including 2o
							* excludes 2o

Teacher E: Descriptions of Pacing

Table 29

Teacher E (see also Tables 30-32)

BEGINNING CHOIR-Teacher E			
Structure C	5 RS	Alternates activities	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm	4.14	RS 1 Rpm	2.92
Rpm	2.94	Rpm	2.97
Mean Duration	19 sec.	Mean Duration	23 sec.
% Time	63%	% Time	37%
Overall Pacing	Slow/Moderately Slow Ratio 3:1		
Student Response/Feedback 18 approvals/16 disapprovals			

RS=Rehearsal Segment Rpm=Rate per minute

ADVANCED CHOIR-Teacher E			
Structure A	3 RS	Fast/slow/slow	
Teacher Behaviors		Student Behaviors	
RS 1 Rpm	2.75	RS 1 Rpm	1.90
Rpm	3.03	Rpm	2.16
Mean Duration	18 sec.	Mean Duration	26 sec.
% Time	52%	% Time	48%
Overall Pacing	Moderately Slow/Slow		
Student Responses/Feedback 12 approvals/11 disapprovals		Ratio 3:1	

RS=Rehearsal Segment Rpm=Rate per minute

Beginning Choir: Rehearsal Structure. Teacher E, Beginning Choir, alternated activities consistent with Structure C. Teacher E used a well-defined classroom structure and used established routines effectively. Rehearsal began with a quick paced warm-up period. The rate per minute of teacher behaviors, 4.14, was higher than any other rehearsal segment (see Table 9). Rehearsal segments 2 and 3 included sight-reading exercises similar in content and approach to those used by Teacher B. Rehearsal Segment 3 was the shortest of the five rehearsal segments, however Rehearsal Segments 1, 2, and 3 were less than 20% of the total time (see Tables 4 & 5). Rehearsal Segment 3 was a short rehearsal of a familiar, fast tempo accompanied piece followed by detailed work on a motet. The detailed rehearsal of the motet was the longest rehearsal segment recorded, totaling 39% of the rehearsal time. Students moved to choral risers in the room for Rehearsal Segment 4 and repeated the literature from Rehearsal Segments 3 and 4 in concert formation, much like a dress rehearsal.

Tempos and the level of difficulty were varied in this rehearsal. The analytical, more difficult part of these rehearsals had a high percentage of teacher verbalizations, but the students remained focused even during repetitions of long durations (see Table 8). The physical activity of moving from seated risers to choral risers was an effective change of activity allowing students to relax and stretch even though the teacher continued with verbal instruction during the move. This structure was consistent with Structure C.

Beginning Choir: Frequency. As shown in Table 9 the rates per minute for Teacher E behaviors were highest in Rehearsal Segment 1 and durations were shorter (see Table 32). Other rehearsal segments were slightly below the mean rate per minute, or the same. Teacher E's mean rate of 2.94 changes per minute was the same as the mean rate for all five subjects. The overall student behavior rate per minute was below the mean, 2.16 changes per minute, although Rehearsal Segments 3 and 4 exhibited a higher rate. Rehearsal Segment 2 demonstrated the lowest rate of Teacher E recorded at 1.33 (see Table 9) but 1ar behaviors were used during 14% of that rehearsal segment (see Table 27). Durations and rates per minute were consistent with slower pacing. Durations for teacher instruction (1a) behaviors were recorded at 25 seconds and student performance (2p) was 20.05 seconds (see Table 27). The lengthy durations combined with a low rate per minute across the rehearsal would demonstrate an overall moderately slow paced rehearsal and would be consistent with lower rated excerpts (Yarbrough & Madsen, 1998).

Beginning Choir: Direct Instruction. Teacher used feedback in the Beginning Choir at a high rate. Approvals slightly exceeded disapprovals 18:16 for a total frequency of 34 feedback statements. Approvals were observed as more specific than disapprovals. Complete and incomplete teaching cycles of various lengths were recorded, but durations of instruction within the cycles were lengthy. Student attentiveness and attitude can be adversely affected by a high rate of disapprovals, however Teacher E used disapprovals in a matter of fact way, and was never sarcastic or punishing. Feedback statements in general

demonstrated corrective information, but not prescriptive. Students were observed as being highly attentive.

Advanced Choir: Rehearsal Structure. Teacher E used a rehearsal structure most resembling structure A. The three rehearsal segments were divided into 22%, 45%, and 33% of the rehearsal time (see Tables 4 & 5). Rehearsal Segment 1 followed an established and familiar routine of energetic exercises. Students moved to the choral risers in the room for Rehearsal Segment 2 and began a detailed study of a motet. Students did not use their music for reference, even though the piece was “in progress”. The stated intent of the teacher was to rehearse during Rehearsal Segment 2, and then use Rehearsal Segment 3 as a dress rehearsal. This would be consistent with Structure A. However, the final rehearsal segment did not function as a dress rehearsal. The rates per minute did not change significantly as would be expected in a dress rehearsal or “sing through” activity and behaviors demonstrated continued rehearsal patterns. Fast tempos and energetic activity marked the beginning of rehearsal, followed by detailed, tedious work. The rehearsal resembles Structure A more than B or C and fits the stated intent of the teacher, even though the final rehearsal segment did not function as intended.

Advanced Choir: Frequency. The mean rate per minute for teacher behaviors was 3.03 and 2.16 for student behaviors. These rates were consistent with slower pacing models. The rates for each rehearsal segment were recorded below the mean for all advanced choirs, 3.53 teacher behaviors and 2.74 student behaviors (see Table 9). Durations of behaviors indicated that while the teacher

durations were 18 seconds (1ar excluded), the student durations were above 20 seconds (see Table 32). Students were observed standing throughout Rehearsal Segments 2 and 3 but remained highly attentive and on-task. The consistency of rates per minute and durations throughout the rehearsal indicated that the pace did not change and remained consistent with slow pacing.

Advanced Choir: Direct Instruction. Teacher E used teaching cycles in the same way used in the Beginning Choir rehearsal but with a lower rate of feedback. During the rehearsal Teacher E used 12 approvals and 11 disapprovals compared to 34 total in the Beginning Choir. Rehearsal Segment 1 frequency of feedback showed the teacher as highly approving, however as the rehearsal progressed Teacher E became more disapproving. Disapprovals were longer in durations and totaled 229 seconds while approvals totaled 99 seconds. During Rehearsal Segment 2 the teacher made frequent stops to work on diction, experiment with the key, and give attention to details of phrasing and style. Teaching cycles were mixed, however during complete cycles the feedback was general rather than specific and prescriptive.

It was observed that the teacher and students became discouraged during Rehearsal Segment 3, perhaps the result of attempting a dress rehearsal too soon. The students were observed standing on choral risers for 30 minutes of the rehearsal before they sat on the risers and assessed the rehearsal with the director.

Table 30 Teacher E – Beginning Choir

CATEGORIES OF BEHAVIOR: FREQUENCY	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	1	7	3	3	2	2	1	6	8
Rehearsal Segment 2	1	7	2	1	2	1	0	5	2
Rehearsal Segment 3	1	3	0	2	3	3	0	3	5
Rehearsal Segment 4	5	20	1	1	8	5	0	4	17
Rehearsal Segment 5	1	5	1	3	3	3	1	2	8
FREQUENCY OF BEHAVIORS	9	42	7	10	18	14	2	20	40
DURATION IN SECONDS									
Rehearsal Segment 1	60	99	9	13	13	20	60	112	147
Rehearsal Segment 2	3	276	77	12	10	18	0	100	114
Rehearsal Segment 3	19	115	0	19	49	54	5	51	98
Rehearsal Segment 4	95	467	22	36	98	143	0	15	332
Rehearsal Segment 5	27	92	32	29	63	107	27	17	111
TOTAL SECONDS	204	1049	140	109	233	342	92	295	802
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	60.00	14.14	3.00	4.33	6.50	10.00	60.00	18.67	18.38
Rehearsal Segment 2	3.00	39.43	38.50	12.00	5.00	18.00	0.00	20.00	57.00
Rehearsal Segment 3	19.00	38.33	0.00	9.50	16.33	18.00	0.00	17.00	19.60
Rehearsal Segment 4	19.00	23.35	22.00	36.00	12.25	28.60	0.00	3.75	19.53
Rehearsal Segment 5	27.00	18.40	32.00	9.67	21.00	35.67	27.00	8.50	13.88
TOTAL REHEARSAL MEAN DURATION IN SECONDS	22.67	24.98	20.00	10.90	12.94	24.43	46.00	14.75	20.05

Table 30 - continued

PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	14.0%	23.0%	2.1%	3.0%	3.0%	4.7%	14.0%	26.0%	34.2%
Rehearsal Segment 2	0.5%	49.4%	13.8%	2.1%	1.8%	3.2%	0.0%	17.9%	20.4%
Rehearsal Segment 3	4.9%	29.7%	0.0%	4.9%	12.7%	14.0%	1.3%	13.2%	25.3%
Rehearsal Segment 4	8.0%	39.4%	1.9%	3.0%	8.3%	12.1%	0.0%	1.3%	28.0%
Rehearsal Segment 5	5.6%	19.2%	6.7%	6.1%	13.2%	22.4%	5.6%	3.6%	23.2%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	6.6%	34.5%	2.1%	3.6%	7.7%	11.3%	3.0%	9.7%	26.4%
normed	6.3%	32.9%	2.0%	3.4%	7.3%	10.8%	2.9%	9.2%	25.1%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	11%	17%	43%	30%	11%	14%	50%	30%	20%
Rehearsal Segment 2	11%	17%	29%	10%	11%	7%	0%	25%	5%
Rehearsal Segment 3	11%	7%	0%	20%	17%	21%	0%	15%	13%
Rehearsal Segment 4	56%	48%	14%	10%	44%	36%	0%	20%	43%
Rehearsal Segment 5	11%	12%	14%	30%	17%	21%	50%	10%	20%

Table 31 Teacher E – Advanced Choir

CATEGORIES OF BEHAVIOR: FREQUENCY	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	4	7	3	3	4	0	1	7	7
Rehearsal Segment 2	4	17	4	8	5	6	0	3	26
Rehearsal Segment 3	2	12	2	5	3	5	1	1	16
FREQUENCY OF BEHAVIORS	10	36	9	16	12	11	2	11	49
DURATION IN SECONDS									
Rehearsal Segment 1	160	46	167	20	43	0	41	288	145
Rehearsal Segment 2	138	201	153	115	26	94	0	35	718
Rehearsal Segment 3	57	226	67	74	30	135	39	25	411
TOTAL SECONDS	355	473	387	209	99	229	80	348	1274
MEAN DURATION IN SECONDS									
Rehearsal Segment 1	40.00	6.57	55.67	6.67	10.75	0.00	41.00	41.14	20.71
Rehearsal Segment 2	34.50	11.82	38.25	14.38	5.20	15.67	0.00	11.67	27.62
Rehearsal Segment 3	28.50	18.83	33.50	14.80	10.00	27.00	39.00	25.00	25.69
TOTAL REHEARSAL MEAN DURATION IN SECONDS	35.50	13.14	43.00	13.06	8.25	20.82	40.00	31.64	26.00

Table 31 - continued

PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL	1o	1a	1ar	1p	3a	3d	2o	2r	2p
Rehearsal Segment 1	24.1%	6.9%	25.2%	3.0%	6.5%	0.0%	6.2%	43.4%	21.8%
Rehearsal Segment 2	10.4%	15.1%	11.5%	8.6%	2.0%	7.1%	0.0%	2.6%	53.9%
Rehearsal Segment 3	5.9%	23.4%	7.0%	7.7%	3.1%	14.0%	4.0%	2.6%	42.6%
PERCENTAGE OF EACH BEHAVIOR FOR THE TOTAL REHEARSAL									
	12.0%	16.0%	13.0%	7.0%	3.3%	7.7%	2.7%	11.8%	43.0%
normed	10.3%	13.8%	11.2%	6.0%	2.8%	6.6%	2.3%	10.2%	37.1%
PERCENTAGE OF TOTAL BEHAVIORS FOUND IN EACH REHEARSAL SEGMENT									
Rehearsal Segment 1	40%	17%	33%	19%	33%	0%	50%	64%	14%
Rehearsal Segment 2	40%	47%	44%	50%	42%	55%	0%	27%	53%
Rehearsal Segment 3	20%	33%	22%	31%	25%	45%	50%	9%	33%

Teacher E-Beginning

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	430	18	16	40%	60%	16	32
Rehearsal Segment 2	559	15	7	69%	31%	28	39
Rehearsal Segment 3	387	13	8	66%	34%	25	18
Rehearsal Segment 4	1184	43	20	71%	29%	21	12
Rehearsal Segment 5	478	16	11	69%	31%	24	16
Total	3038	105	62	63%	37%	23	23
						19 seconds	
						Not including 1ar	

Teacher E-Advanced

	Duration in Seconds	Frequency Teacher Behaviors	Frequency Student Behaviors	Percentage of time spent in Teacher Beh.	Percentage of time spent in Student Beh.	Mean Duration of Teacher Behaviors	Mean Duration of Student Behaviors
Rehearsal Segment 1	664	20	15	48%	52%	24	34
Rehearsal Segment 2	1332	45	29	51%	49%	27	20
Rehearsal Segment 3	964	29	18	56%	44%	22	25
Total	2960	94	62	52%	48%	24	26
						18 seconds	
						Not including 1ar	

Summary

The purpose of this study was to investigate instructional pacing by observing and recording 5 experienced teachers in rehearsal, to describe their rehearsal behaviors, and compare their usage of time to multiple analyses of pacing drawn from existing literature. Subjects were selected based on professional and educational qualifications. They showed similar structure in beginning and advanced choirs. Six rehearsals used Rehearsal Structure C.

Table 11

Rehearsal Structures Used in Ten Rehearsals

	<u>Teacher</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
Beginning Choir		C	A	C	C	C
Advanced Choir		C	A	C	A/B	A

Beginning choirs were divided into 4.5 mean rehearsal segments (major activity shifts), advanced choirs into 3.8 mean rehearsal segments, and all rehearsals included at least 3 segments. The shortest rehearsal segment was 4.6% of the total rehearsal time, and the longest was 49.7%. All rehearsals contained examples of fast and slower pacing. Teacher instruction (408) and student performance (609) were the highest recorded behaviors. Mean durations for teacher behaviors were 17 and 16 seconds, and 26 and 31 seconds for student behaviors. The lowest rate per minute for any rehearsal segment was .75

and the highest rate per minute was 7.7. Beginning choir rate per minute was 2.94 (teacher) and 3.04 (student). The advanced choir mean was 3.53 and 2.74. Three teachers were more approving, though disapprovals were directed towards academic behaviors rather than social. The total number of approvals was 139 and disapprovals totaled 88. The ratio of student responses to feedback statements varied widely from 2:1 to 6:1. The teacher with the overall fastest pace also showed a high ratio of student responses to feedback statements (see Table 12).

The results of this comparison show pacing as a complex part of effective teaching strategies needed for enhancement of student learning. The subjects used in this study all showed teaching behaviors consistent with effective, good teaching and all rehearsals had fast and slower paced examples. The descriptions and models used are intertwined and show that experienced teachers use fast and slow pacing during rehearsals to ensure student achievement.

CHAPTER FIVE

DISCUSSION

Providing prescriptive strategies for new, novice, or experienced teachers in need of instructional pace remediation is an important goal for music education researchers. Variables which contribute to successful classrooms and therefore, successful teachers, are complex and intertwined. Pacing a choral rehearsal so that students are responding, enjoying, and learning may never be a totally objective task. Effective teachers infuse their own personality, teaching skills, perspective on the music, and instructional approaches into their teaching. Isolating and describing behaviors of five experienced teachers who have demonstrated success in the classroom (using analysis gleaned from existing literature) may provide insight into planning rehearsals more efficiently.

Rehearsal Structures

Cox (1989) reported enthusiasm for teaching music was one of the most important characteristics of the successful directors he studied, underscoring the importance of teacher magnitude and intensity variables. Cox also suggested that regardless of the preferred rehearsal structure, the important factor is that

directors use a definite structure for rehearsals. In other words...have a plan, which plan is less important.

All five teachers I observed displayed definite rehearsal structure, though some were more clearly defined. Teachers B and E showed the most controlled structure, while teachers A, C, and D allowed the “teachable moment” to vary their structure somewhat. Teacher A demonstrated the most definite use of closure activity while teachers B and E preferred to use final moments for further assessment. Teachers B and D used warm ups for extensive work on building tone and developing resonance, while Teachers C and E used energetic exercises aimed at alertness and focus. Teacher A used less time in warm ups, and used vocalises more for vocal development. All teachers used solfege at some point in their beginning rehearsal segment.

It was interesting to note that teachers using warm up (Rehearsal Segment 1) to focus on building musical skills needed to meet the daily goals appeared to produce the most musical progress. Warm ups can get students and teachers awake and moving, or provide an opportunity to incorporate musical skills needed for the remainder of the rehearsal. Warm ups can also lack purpose. Planning warm up activities that can transfer to musical tasks in the lesson seemed an efficient use of rehearsal time, and appeared to promote student attentiveness in the transition from warm ups to literature study.

Noting that 9 of 10 rehearsals closely followed Structures A or C suggests that rehearsals alternating activities of varying lengths indeed may be an important step in good pace, if nothing more than establishing contrast (fast is

quite evident when paired with slow, and vice versa.) Teachers who are on a block schedule might better use Structure C and vary activities with more rehearsal segments such as Teacher A who used 5 segments. Teacher B used Structure A effectively in a rehearsal of 50 minutes. However, the length of detailed sight-reading study and repetitions did not allow much time for students to perform choral music. High magnitude teaching demonstrated by this teacher did have a definite affect on maintaining student attentiveness and though durations were long and rates per minute low, the students remained engaged. Teachers with less intensity might meet sight-reading goals successfully in several shorter lessons. The use of sight-reading materials designed for Music Performance Assessment (formerly District/State Festival) is a topic demanding further study as it may be helpful to isolate whether achievement in sight-reading these exercises (used in previous festivals) transfers to actual sight-reading of choral literature, or whether students are just learning to use the materials in isolation.

Structure A might work especially well on rehearsal days cut short by pep rallies or “early release”. Planning for a quick, faster-paced activity at beginning and end could help teachers accomplish their musical goals on those less than normal days. By placing tedious, slower paced activities, in the middle of Structure A, Teacher B allowed the final faster paced activity to function as reinforcement for “a job well done.”

Elements of Time

Studies by Duke, Yarbrough, and others have reported that the mean rate per minute of teacher and student behaviors is a strong indicator of fast or slow pacing. The importance of frequent alternation of activities has support from early studies showing that expert teachers give students frequent opportunities to respond, which seems more critical than total student performance time. The observed rehearsals in this study showed a mean rate per minute for teachers of 3.09 and students of 3.04 in the beginning choirs. The advanced choir rehearsals showed teacher rate of 3.36 and student rate of 2.74. These rates encompass all behaviors observed over the entire rehearsal; so formal comparison directly to previous research is not possible since most involved short excerpts. Each rehearsal by these experienced teachers had moments of very intense and fast pace. Some teachers sustained a fast pace longer than others, which could be the result of personality or the teachers' musical goals of that day. Information about rate per minute over a complete rehearsal may be helpful, but this would be more definitive if longitudinal study was done with unscripted, full rehearsals. Not isolated in this study is the effect of high magnitude teaching behaviors when there is low rate per minute and long durations, which might provide new insight into the weight of those three aspects of pace.

Another important variable in effective teaching and pacing is duration of teaching behaviors. The mean duration of teacher and student activities (5-6 seconds) was reported in highly rated teaching excerpts by Yarbrough (1998 &

1999) who also reported lower ratings for rehearsals with slow pacing of 9-28 seconds mean durations of teacher and student behaviors. In the current study, rehearsals of 5 teachers showed a mean duration for teacher behaviors of 17 seconds and 29 seconds mean duration for student behaviors for total rehearsal behaviors. Using definitions from Yarbrough (1999), the mean for the five teachers in the present study would all be considered slow-pace. However, the durations (17 & 29 seconds) also included rehearsals segments that were “dress rehearsal” or closure activities that require extended student performance to be effective. It may be that the context of teacher and student durations is a key factor in evaluating rehearsal pace.

If the goal had been to rate these teachers, which it was not, using only teacher instruction and student response behaviors would give a clearer snapshot of pacing, using duration as one of the most important variables. Also, it appears that a truer picture may be obtained when analyzing full rehearsals instead of excerpts. All teachers used fast and slower paced activities within their rehearsal structure effectively; again, activities such as a “sing through” or closure activity may appear to slow the pace, but are actually very effective within the context of the total rehearsal.

Isolating the durations for teacher instruction, modeling, and feedback, teacher behavior duration for beginning choirs was 15 seconds while student response behaviors measured 23 seconds (see Table 12). In the advanced choirs, teachers showed a shorter mean duration of 12 seconds of teacher behavior, consistent with durations of faster pacing. Student response behaviors

gave a different picture in the advanced choirs, with a longer duration than the beginning choirs, 25 seconds. Both set of durations showed considerable difference between teacher and student durations (15:23, 12:25). Keeping teacher talk to a minimum has long been recommended for effective teaching and the mean duration for teachers in this study indicates moderately fast pacing. The longer student mean durations may be a result of students singing several long, extensive warm up exercises or singing an entire piece. The length of student responses may be affected by the difficulty of the literature and how well the students know the music. If students have polished a piece and are working on memorization, the durations will be long and rates per minute low, which probably does not indicate that the pace is slow.

During an unscripted full-length rehearsal, there is a tremendous difference in a behavior of 12 seconds and one of 25 seconds. Teachers not familiar with research protocol may feel defensive if it is suggested that they have a “slow” pace (because durations are 16 seconds), because they understand that 16 seconds is not slow and is certainly much faster than 25 seconds. A pacing model that differentiates faster and slower pacing, perhaps accommodating a “run through” or other choral rehearsal necessities, might be a helpful expansion of pacing analysis. How the model functions may be quite important if the intent of research is to enrich teachers who are not researchers, and illuminate findings for those unfamiliar with research journals (see Table 2). In-service training and workshops with practical applications of pacing research could also benefit new, novice, or frustrated experienced teachers.

Teacher instruction during student response (1ar) was included in this study to isolate a teaching behavior that has not yet been studied. Every teacher was observed using this behavior and 9 of the rehearsals contained 10 or more 1ar behaviors. The occurrence of 1ar was most frequently used while students were exhibiting 2r behaviors (counting, clapping, etc.) rather than 2p (performing). This may be a result of the teacher needing to give frequent instruction and feedback to keep students on task during lengthy drill work or repetitious exercises. There was some audible instruction given during student performance and this should probably be examined for effectiveness. Teachers of larger classes must still be sure that students can hear 1ar, so their cues tend to be non-verbal. Teachers who used teaching cycles and feedback most effectively also used 1ar at a high rate, particularly in Rehearsal Segment 1. What that relationship may be is unknown but worthy of study.

Direct Instruction: Feedback

The Direct Instruction model, 1-2-3, was present to a degree in all observed rehearsals. Teachers certified in the past fifteen years through a music education degree likely have been exposed to the use of sequential patterns or at least have some understanding of feedback usage.

All five teachers are highly effective teachers and they gave more approvals than disapprovals in both beginning and advanced choirs. However, the overall frequency of all feedback was low in several observed rehearsals and frequently the feedback statements were nonspecific. Several rehearsals recorded more disapproval, though the ratio of approvals to disapprovals was roughly 2:1 for all rehearsals. Two teachers, A and D, were consistently more approving with both their choirs. Teacher C used few specific approvals, but used words like “good”, “okay” in a normal speech pattern. These were not recorded as feedback as they lacked eye contact and were not directed towards any specific behavior or response (more like a verbal tic). Clearly, the intent of these behaviors did match how they functioned.

Disapproval feedback was almost always directed towards academic behaviors, rather than social. Social disapproval was almost nonexistent because the teachers were highly effective and had routines established that promoted on task behaviors. Previous studies indicated that this is an important distinction as student attentiveness and attitude can be affected negatively when disapproval is directed towards social, rather than an academic correction. Teacher B, who spent less time singing and much of the rehearsal skill building, used a high level of disapprovals to clarify success and build skills. Because disapprovals in this study were not punishing or unkind, they did not appear to contribute to a perception of slow pacing or diminish the student’s attentiveness. The teacher’s voice was reassuring and never gave the impression of displeasure. If something was wrong, it was just wrong and a remedy was prescribed. Teacher B displayed

strong personal behaviors consistent with intensity and high magnitude, a strong presence in the classroom that resulted in high attentiveness and a positive environment.

Teacher B was trained as an elementary Kodaly specialist and used sequential patterns extensively throughout both rehearsals. Teacher D, who demonstrated the fastest paced rehearsals and used high approval feedback, also was trained as an elementary specialist with Kodaly and Orff training. Teacher specialty training (such as Kodaly and Orff) may be helpful to those seeking to structure rehearsals for fast pace, especially if their training has been primarily focused on secondary methods. Task analysis and sequential patterns taught in these classes might help remediate problems of limited specific feedback and improve the use of effective teaching strategies.

It was observed that all 5 teachers gave the impression of being more approving than disapproving in their classroom. Though these teachers reflected different personalities and teaching styles, all 5 created a positive atmosphere in the classroom. Feedback was a mix of specific and general, but teachers with the most sequential patterns gave the most specific feedback. Less feedback occurred in rehearsals where slightly more off-task behaviors were observed. Experienced teachers may need more remediation using appropriate feedback than any other teaching strategies. Musical correcting may so consume teachers' attention and time that the power of specific approvals to maintain student attention may become a secondary priority.

Teacher D consistently employed a very high use of specific approvals and low use of disapprovals. However, on several occasions Teacher D demonstrated approval of appropriate social behaviors of the group (while others were obviously not on-task) with little result. While use of approvals to modify behavior is appropriate, if off-task behaviors continue, the approvals may be neutralized. It would then be an appropriate time for a very specific and effective disapproval. Teachers also displayed different tolerances for noise and activity, though students' attentiveness was definitely affected by off-task behaviors around them.

Effective teachers have been shown to engage in verbal behaviors over 40% of the rehearsal time (Blocher, Greenwood, & Shellahamer, 1997) indicating much academic instruction being given. Observed teachers in this study spent an average of 42.8% of the rehearsal time in some form of verbalization. It is interesting to note that one teacher with indications of slower pacing showed less time in verbalizations that involved 1a behaviors, and teachers with faster pacing frequently recorded higher 1a verbalization percentages. Extended teacher talk can certainly result in slower pace if the durations are lengthy and activities do not alternate frequently. However, extended teacher talk that results in frequent, short instructions that gives students many opportunities for response is an indicator of fast pacing. Less teacher talk can result in students responding for longer durations with no or little feedback, thus affecting the function of pace, thus student achievement, attitude, and attentiveness could suffer from too little teacher talk as well as from too much. Effective pacing appears to be more

dependent on rate and duration of behaviors than the total amount of time spent in instruction or performance. Effective pacing may also involve the teacher's ability to vary pace, as all of these rehearsals contained faster and slower examples of pacing within the rehearsal structure.

The lack of vocal modeling by these 5 teachers was unexpected. Teachers modeled very little with their voices, with the exception of Teacher D, and also Teacher B during warm ups (Rehearsal Segment 1). All five of these teachers are above average singers. It may be important that in-service provide information for teachers regarding the value of giving students good vocal models. Singing in a rehearsal, with a purpose, is not only a good model for the students, but may be relaxing and beneficial for the teacher. Singing does not cause most physiological vocal problems, nor does singing tire the voice more than extended talking.

Future study

Infusing empirical behaviors (such as use of time) with a training program designed for teacher self analysis might well serve to improve instructional pace. Teachers in the field can so easily become isolated or stagnate. Videotaping rehearsal behaviors to provide information, such as rates per minute and durations, and recording sequential patterns, could provide self-analysis tools for on the spot, prescriptive strategies. This self-corrective approach by necessity should be simple, easy to interpret, and practical. Teachers could be trained

through in-service or in workshops to interpret the information and apply it appropriately.

The continuing problem of connecting research and teachers remains present. Unfortunately, many high school and middle school teachers seldom read the Journal of Research in Music Education (JRME) or any other journal that involves research. In the current study 1 of the 5 teachers has subscribed to JRME, or even Update, a journal written for practitioners. A “Reader’s Digest” overview of current research findings could dramatically affect how teachers perceive the role of research related to music teachers. Studies from JRME and other major journals could be synthesized into practical applications easily understood by teachers who may not have been exposed to research classes. Music Educators’ National Conference (MENC) currently has on line resources that address questions from members. However, little practical information from classroom research is found on the site and many members either are not aware or do not take advantage of this service. Making a document that is “teacher friendly” and communicating to MENC members the value and practical nature of this condensed document might encourage more classroom teachers to read, value, and use findings from music education research.

Three final queries for future study: 1) Do sight-reading booklets, such as those published by the Florida Vocal Association and the Georgia Vocal Association, transfer to reading choral music, or is it a disconnected activity that students achieve and then discard? 2) Is a teacher giving instruction while students are performing (1ar) an efficient way to rehearse? How does 1ar

function in regard to student achievement and attentiveness? 3) Are choral teachers modeling vocally for their students? If not, why? Perhaps vocally trained music teachers feel they shouldn't over sing when teaching. Of the many vocal models students hear everyday, their music teacher is probably the best, so hearing this model seems important.

Pacing rehearsals will always be a complex, multi-dimensional part of effective teaching. Good pacing is not necessarily just "fast" pacing. Teachers in this study all conducted efficient, effective rehearsals and all had varying degrees of fast and slow pace. There is no single solution for pacing problems, but rather many components that, combined with good judgment and high intensity, help teachers develop skills as music teachers.

APPENDIX A

Participation Letter to Subjects

Informed Consent Letter

Subjects Biographical Survey

Human Services Agreement

Judy R. Arthur

Letter to participants: A Description of Master Teachers in Rehearsal: A Contrast of Pacing in Beginning and Advanced Choruses.

Dear Colleagues:

I very much appreciate your willingness to participate in this research project. My goal is to gain information from your skills that can be used to better the preparation of beginning and in-service teachers. Sharing knowledge is a valuable and necessary part of keeping teachers informed and challenged. Your contribution to this is very valuable.

Enclosed you will find a one page survey and a consent form which I need for you to sign and date. Your answers may be brief and I will contact you if I have any questions. The criterion used to select you was years in the classroom, professional reputation, and assessment of your choirs. None of this information will ever be shared with anyone, nor will you be identified in the project by name or by school. The only other person with access to the tapes is my major professor, Dr. Judy Bowers.

Again I thank you and look forward to sharing this research with you in the near future.

Sincerely,

Judy R. Arthur

Informed Consent Form

I freely and voluntarily consent to be a participant in the research project entitled "A Description of Master Teachers in Rehearsal: A Contrast of Pacing in Beginning and Advanced Choruses."

Judy R. Arthur, a doctoral candidate in the Florida State University School of Music, is conducting this research. I understand the purpose of her research is to better understand how master teachers pace rehearsals in a beginning class and an advanced class.

I understand that I will be asked to complete a short survey form and that I will not be identified in the research except by an assigned code.

I understand that only the researcher and the directing professor will view the videotape. Tapes will be stored in the researcher's safe and will be destroyed by May 1, 2010.

The results of this research will be shared with me and I am free at any time to withdraw from this project. I have full knowledge of how to contact the researcher, Judy R. Arthur.

I have read and understand this consent form.

Name _____ Date _____

Title _____ School _____

Teacher Survey
January 27, 2002

1. Name _____
2. Years of Teaching Experience _____
3. Educational Background (include institution and degrees)
4. Describe briefly teaching positions you have held, including number of years
5. Have you ever attended a workshop in rehearsal pacing, or studied rehearsal pacing in depth as part of a class?
6. Have you ever read a research article relating to this topic?
7. Do you subscribe to a research journal such as the Journal of Research in Music Education (JRME)?
8. How would you describe your approach to planning your rehearsals?
9. Do you feel you approach the planning of your beginning choir rehearsals differently from your advanced choirs?
10. Do you participate in an evaluation process with your choirs each year?
11. Have your choirs received favorable ratings and comments from adjudicators?



Office of the Vice President
for Research
Tallahassee, Florida 32306-2763
(850) 644-5260 • FAX (850) 644-4392

Human Subjects Committee RENEWAL NOTIFICATION

Date of Notice: January 18, 2002

**To: Judy Arthur
272 Timberlane Rd.
Tallahassee, FL 32312**

From: Human Subjects Committee

**Re: Renewal of Project Entitled: Students' Perception Of Pacing In A choral Rehearsel
Using Difficult nd Easy Literature**

This is to advise you that your approval for use of human subjects in the above-referenced research project will expire 3/18/02 research involving human subjects may be conducted after that time unless an extension is granted by the Human Subjects Committee.

In order to be granted an extension and continue your research, you must complete and submit the attached Request for Renewal to the Committee by 2/22/02. If you wish to continue your approval for this project, or if your study has been completed and continuation is not necessary, please indicate in the box below and return this form only to the Committee.

If no response is received to this notice by 4/18/02 a formal termination will be issued to you, your major professor and/or department chair (whichever is applicable).

If you have any questions, please do not hesitate to the Peggy Haire, Assistant to Human Subjects Committee at phaire@mailier.fsu.edu.

:ph
Enclosure
Cc: Dr. Judy Bowers
Department: School Of Music
Approval Category: Full Committee
HSC No. 01.110

No renewal is necessary.

APPENDIX B

Rehearsal Data from Subjects

Subject

Teacher A

Teacher B

Teacher C

Teacher D

Teacher E

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	
						2o	26
0	26	26	26	1ar	70	2r	70
1	36	96	70	1ar	31	2r	31
2	7	127	31	1p	4		
2	11	131	4			2p	13
2	24	144	13	3a	4		
2	28	148	4	1ar	42	2p	42
3	10	190	42	1p	7		
3	17	197	7			2p	43
4	0	240	43	3a	10		
4	10	250	10			2p	45
4	55	295	45	1p	11		
5	6	306	11			2p	2
5	8	308	2	3a	9		
5	15	315	9			2p	63
6	18	378	63	1p	22		
6	40	400	22			2p	52
7	32	452	52	1ar	32		
8	4	484	32			2p	46
8	50	530	46	1p	15		
9	5	545	15	3a	4		
9	9	549	4			2p	15
9	24	564	15	1a	27		
9	51	591	27			2p	3
9	54	594	3	1a	32		
10	26	626	32			2p	57
11	23	683	57	1s	29	2o	29
11	52	712	29	1p	8		0
12	0	720	8			2p	114
13	54	834	114	1a	12		
RS 2 14	6	846	12			2o	40
14	46	886	40	1a	26		
15	12	912	26			2p	21
15	33	933	21	3a	11		
15	44	944	11	1a	3		
15	47	947	3			2r	2
15	49	949	2	1p	3		
15	52	952	3			2r	2
15	54	954	2	1a	4		
15	58	958	4			2r	1
15	59	959	1	1p	3		
16	2	962	3			2r	2
16	4	964	2	1p	3		0

RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
	16	7	967	3		0	2r	3
	16	10	970	3	1a	14		0
	16	24	984	14	1p	10		0
	16	34	994	10		0	2p	35
	17	9	1029	35	3a	9		0
	17	18	1038	9	1a	33		0
	17	51	1071	33	1ar	39	2p	39
	18	30	1110	39	3a	24		0
	18	54	1134	24		0	2p	3
	18	57	1137	3	1p	8		0
	19	5	1145	8	3a	11		0
	19	5	1148	11		0	2p	37
	19	45	1185	37	1a	67		0
	20	52	1252	67		0	2p	4
	20	56	1256	4	1p	5		0
	21	1	1261	5		0	2p	4
	21	5	1265	4	1a	19		0
	21	24	1284	19		0	2p	9
	21	33	1293	9	1a	4		0
	21	37	1297	4		0	2p	3
	21	40	1300	3	1a	2		0
	21	42	1302	2		0	2p	3
	21	45	1305	3	1p	3		0
	21	48	1308	3	1ar	12	2p	12
	22	0	1320	12		0	2p	3
	22	3	1323	3	3a	7		0
	22	10	1330	7		0	2p	18
	22	28	1348	18	3a	27		0
	22	55	1375	27		0	2p	13
	23	8	1388	13	1a	19		0
	23	27	1407	19		0	2p	32
	23	59	1439	32	3a	4		0
RS 3	24	3	1443	4	1d	29	2s	29
	24	32	1472	29	1p	16		0
	24	48	1488	16		0	2p	65
	25	53	1553	65	1a	59		0
	26	52	1612	59	1ar	15	2r	15
	27	7	1627	15	1a	9		0
	27	16	1636	9		0	2p	12
	27	28	1648	12	1a	21		0
	27	49	1669	21		0	2p	32
	28	21	1701	32	1a	6		0
	28	27	1707	6	3a	18		0
	28	45	1725	18	1a	66		0

	RS31	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
	29	51	1791	66	1ar	115	2p	115	
	31	46	1906	115	1a	5		0	
	31	51	1911	5		0	2p	13	
	32	4	1924	13	3a	4		0	
	32	8	1928	4	1a	45		0	
	32	49	1969	45		112	2p	112	
	33	56	2036	112	1a	49		0	
	34	45	2085	49		0	2p	14	
	34	59	2099	14	1a	27		0	
	35	26	2126	27		0	2p	2	
	35	28	2128	2	3d	6		0	
	35	34	2134	6		0	2p	16	
RS 4	35	50	2150	16	1d	30	2s	30	
	36	20	2180	30	1p	24		0	
	36	44	2204	24		0	2p	4	
	36	48	2208	4	1a	18		0	
	37	6	2226	18		0	2p	60	
	38	6	2286	60	1a	66		0	
	39	12	2352	66		0	2p	20	
	39	32	2372	20	1a	43		0	
	40	15	2415	43	1ar	22	2p	22	
	40	37	2437	22	1d	23	2s	23	
	41	0	2460	23	1ar	50	2p	50	
	41	50	2510	50	1a	33		0	
	42	23	2543	33		0	2p	19	
	42	42	2562	19	1a	52		0	
	43	34	2614	52		0	2p	19	
	43	53	2633	19	1p	13		0	
	44	6	2646	13		0	2p	5	
	44	11	2651	5	1a	58		0	
	45	9	2709	58		0	2p	5	
	45	14	2714	5	3d	12		0	
	45	26	2726	12	1ar	94	2p	94	
	47	0	2820	94	3a	10		0	
	47	10	2830	10	1d	50		0	
	48	0	2880	50		0		0	

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION
0	0	0	0	0	0	2s	28
0	28	28	28	1p	6		0
0	34	34	6	1ar	24	2p	24
0	58	58	24		0	2p	74
2	12	132	74	1d	6		0
2	18	138	6	1p	4		0
2	22	142	4	1ar	88	2p	88
3	50	230	88	1p	7		0
3	57	237	7		0	2p	4
4	1	241	4	1a	3		0
4	4	244	3		0	2p	83
5	27	327	83	1p	4		0
5	31	331	4		0	2p	19
5	50	350	19	3a	10		0
6	0	360	10		0	2p	21
6	21	381	21	1a	29		0
6	50	410	29	1ar	28	2p	28
7	18	438	28	1a	3		0
7	21	441	3		0	2p	12
7	33	453	12	1s	14	2s	14
7	47	467	14	1a	5		0
7	52	472	5		0	2p	15
8	7	487	15	3a	4		0
8	11	491	4		0	2p	18
8	29	509	18	1ar	6	2r	6
8	35	515	6	1a	9		0
8	44	524	9	1ar	56	2p	56
9	40	580	56	1p	17		0
9	57	597	17		0	2p	59
10	56	656	59	1p	11		0
11	7	667	11		0	2p	49
11	56	716	49	1p	21		0
12	17	737	21		0	2p	23
12	40	760	23	1a	9		0
12	49	769	9		0	2p	9
12	58	778	9	1a	6		0
13	4	784	6		0	2p	9
13	13	793	9	1a	4		0
13	17	797	4		0	2p	6
13	23	803	6	1p	11		0
13	34	814	11	1ar	15	2p	15
13	49	829	15		0	2p	35
14	24	864	35	1ar	36	2r	36

	RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION
		15	0	900	36	3a	10	0
RS 2		15	10	910	10	1d	12	2s
		15	22	922	12	1a	32	0
		15	54	954	32		0	2p
		16	15	975	21	3a	4	0
		16	19	979	4	1a	9	0
		16	28	988	9		0	2p
		16	37	997	9	1p	14	0
		16	51	1011	14		0	2p
		17	16	1036	25	1a	7	0
		17	23	1043	7		0	2p
		17	33	1053	10	3a	11	0
		17	44	1064	11	1a	21	0
		18	5	1085	21		0	2p
		18	11	1091	6	3d	11	0
		18	22	1102	11		0	2p
		18	34	1114	12	3a	5	0
		18	39	1119	5	1a	7	0
		18	46	1126	7		0	2p
		18	53	1133	7	1p	7	0
		19	0	1140	7		0	2p
		19	3	1143	3	3a	8	0
		19	11	1151	8		0	2p
		19	18	1158	7	3d	3	0
		19	21	1161	3		0	2p
		19	35	1175	14	1a	23	0
		19	58	1198	23		0	2p
		20	34	1234	36	3a	14	0
		20	48	1248	14	1a	18	0
		21	6	1266	18		0	2p
		21	13	1273	7	1a	23	0
		21	36	1296	23		0	2p
		21	39	1299	3	3d	2	0
		21	41	1301	2		0	2p
		22	3	1323	22	1a	42	0
		22	45	1365	42		0	2p
		23	12	1392	27	3a	5	0
		23	17	1397	5		0	2p
		23	25	1405	8	1a	14	0
		23	39	1419	14		0	2p
		23	48	1428	9	3sd	22	0
		24	10	1450	22		0	2p
		24	20	1460	10	1d	22	0
		24	42	1482	22		0	2p

RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION
	24	50	1490	8	3a	12	0
	25	2	1502	12		0	2p 5
	25	7	1507	5	1a	5	0
	25	12	1512	5		0	2p 6
	25	18	1518	6	1a	19	0
	25	37	1537	19		0	2p 5
	25	42	1542	5	1p	6	0
	25	48	1548	6		0	2p 3
	25	51	1551	3	1p	2	0
	25	53	1553	2		0	2p 35
	26	28	1588	35	3a	2	0
	26	30	1590	2		0	2p 3
	26	33	1593	3	1p	3	0
	26	36	1596	3		0	2p 5
	26	41	1601	5	3a	3	0
	26	44	1604	3		0	2p 16
	27	0	1620	16	3a	7	0
	27	7	1627	7		0	2p 5
	27	12	1632	5	1p	3	0
	27	15	1635	3	1ar	31	2p 31
	27	46	1666	31		0	2p 17
	28	3	1683	17	3a	19	0
	28	22	1702	19		0	2p 31
	28	53	1733	31	3a	10	0
	29	3	1743	10		0	2p 27
	29	30	1770	27	3d	17	0
	29	47	1787	17		0	2p 38
	30	25	1825	38	3a	15	0
	30	40	1840	15		0	2p 19
	30	59	1859	19	3a	3	0
RS 3	31	2	1862	3	1s	32	2s 32
	31	34	1894	32	1p	9	0
	31	43	1903	9		0	2p 43
	32	26	1946	43	1a	27	0
	32	53	1973	27		0	2p 3
	32	56	1976	3	1a	3	0
	32	59	1979	3		0	2p 55
	33	54	2034	55	3a	5	0
RS 4	33	59	2039	5	1d	4	0
	34	3	2043	4	1a	21	0
	34	24	2064	21		0	2p 5
	34	29	2069	5	1a	4	0
	34	33	2073	4		0	2p 9
	34	42	2082	9	1a	6	0

RS4	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION
34	48	2088	6		0	2p	6
34	54	2094	6	3d	3		0
34	57	2097	3		0	2p	4
35	1	2101	4	3d	6		0
35	7	2107	6		0	2p	4
35	11	2111	4	1p	13		0
35	24	2124	13		0	2p	6
35	30	2130	6	1a	42		0
36	12	2172	42		0	2p	4
36	16	2176	4	3a	2		0
36	18	2178	2		0	2p	4
36	22	2182	4	1a	2		0
36	24	2184	2		0	2p	6
36	30	2190	6	1a	5		0
36	35	2195	5		0	2p	5
36	40	2200	5	1a	3		0
36	43	2203	3		0	2p	12
36	55	2215	12	1a	11		0
37	6	2226	11		0	2p	16
37	22	2242	16	1a	9		0
37	31	2251	9		0	2p	7
37	38	2258	7	1a	4		0
37	42	2262	4		0	2p	8
37	50	2270	8	1a	10		0
38	0	2280	10		0	2p	6
38	6	2286	6	1p	32		0
38	38	2318	32		0	2p	46
39	24	2364	46	1a	30		0
39	54	2394	30		0	2p	11
40	5	2405	11	1p	12		0
40	17	2417	12		0	2p	7
40	24	2424	7	1a	13		0
40	37	2437	13		0	2p	17
40	54	2454	17	3d	21		0
41	15	2475	21		0	2p	17
41	32	2492	17	1a	21		0
41	53	2513	21		0	2p	129
44	2	2642	129	1a	8		0
44	10	2650	8		0	2p	6
44	16	2656	6	1p	18		0
44	34	2674	18	1ar	43	2p	43
45	17	2717	43	1a	56		0
46	13	2773	56	1ar	29	2p	29
46	42	2802	29	1d	38	2s	38

RS 5	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	
RS 5	47	20	2840	38	1a	10	0
	47	30	2850	10	1p	3	0
	47	33	2853	3		0	2p 80
	48	53	2933	80	3a	4	0
	48	57	2937	4			

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENTS	DURATION
0	0	0	0	1a	57			0
0	57	57	57	1a	9			0
1	6	66	9	1ar	59	2r		59
2	5	125	59	1ar	23	2r		23
2	28	148	23	1p	5			0
2	33	153	5		0	2p		8
2	41	161	8	1a	2			0
2	43	163	2		0	2p		2
2	45	165	2	1ar	25	2r		25
3	10	190	25	1a	2			0
3	12	192	2	1ar	12	2r		12
3	24	204	12	1a	4			0
3	28	208	4		0	2r		12
3	40	220	12	1ar	20	2r		20
4	0	240	20	1a	16			0
4	16	256	16		0	2r		17
4	33	273	17	1a	2			0
4	35	275	2		0	2r		16
4	51	291	16	1a	20			0
5	11	311	20		0	2r		57
6	8	368	57	3a	6			0
6	14	374	6	1p	1			0
6	15	375	1		0	2p		2
6	17	377	2	1p	2			0
6	19	379	2		0	2p		2
6	21	381	2	1a	8			0
6	29	389	8		0	2p		3
6	32	392	3	3d	2			0
6	34	394	2		0	2p		3
6	37	397	3	1p	4			0
6	41	401	4		0	2p		4
6	45	405	4	1p	5			0
6	50	410	5	1ar	43	2p		43
7	33	453	43	1a	9			0
7	42	462	9	1ar	73	2p		73
8	55	535	73	1p	3			0
8	58	538	3		0	2p		27
9	25	565	27	1p	4			0
9	29	569	4	1ar	36	2p		36
10	5	605	36	1p	8			0
10	13	613	8		0	2p		34
10	47	647	34	1a	37			0
11	24	684	37		0	2p		93

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENTS	DURATION
	12	57	777	93	1a	18		0
	13	15	795	18	1ar	44	2p	44
	13	59	839	44	1p	5		0
	14	4	844	5	1ar	34	2p	34
	14	38	878	34	1a	8		0
	14	46	886	8		0	2p	31
	15	17	917	31	1a	74		0
	16	31	991	74		0	2p	5
	16	36	996	5	3d	5		0
	16	41	1001	5	1ar	32	2p	32
RS 2	17	13	1033	32	1a	8		0
	17	21	1041	8	1p	4		0
	17	25	1045	4	1ar	34	2r	34
	17	59	1079	34	1a	7		0
	18	6	1086	7		0	2r	6
	18	12	1092	6	3a	22		0
	18	34	1114	22		0	2r	2
	18	36	1116	2	1a	144		0
	21	0	1260	144		0	2r	4
	21	4	1264	4	1a	15		0
	21	19	1279	15		0	2r	3
	21	22	1282	3	1a	8		0
	21	30	1290	8		0	2r	2
	21	32	1292	2	1a	54		0
	22	26	1346	54		0	2r	4
	22	30	1350	4	3a	11		0
	22	41	1361	11	1a	29	2r	29
	23	10	1390	29		0	2r	5
	23	15	1395	5	1a	153		0
	25	48	1548	153		0	2r	2
	25	50	1550	2	3a	6		0
	25	56	1556	6		0	2r	7
	26	3	1563	7	1ar	54	2r	54
	26	57	1617	54	1a	170		0
	29	47	1787	170		0	2r	3
	29	50	1790	3	1ar	8		0
	29	58	1798	8		0	2r	5
	30	3	1803	5	3a	3		0
	30	6	1806	3	1ar	23	2r	23
	30	29	1829	23		0	2r	18
	30	47	1847	18	1a	2		0
	30	49	1849	2		0	2r	2
	30	51	1851	2	1a	45		0
	31	36	1896	45	1p	28		0

	RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENTS	DURATION
	32	4	1924	28		0	2r	17	
	32	21	1941	17	3d	18		0	
	32	39	1959	18		0	2r	9	
RS 3	32	48	1968	9	1a	50		0	
	33	38	2018	50		0	2r	13	
	33	51	2031	13	1a	58		0	
	34	49	2089	58		0	2r	3	
	34	52	2092	3	1a	8		0	
	35	0	2100	8		0	2r	2	
	35	2	2102	2	1a	10		0	
	35	12	2112	10	3a	60		0	
	36	2	2162	60		0	2r	62	
	37	4	2224	62	3d	14		0	
	37	18	2238	14	3a	35		0	
	37	39	2259	35	1a	30		0	
	38	9	2289	30		0	2r	17	
	38	26	2306	17	3a	8		0	
RS 4	38	34	2314	8	1a	38		0	
	39	12	2352	38		0	2r	3	
	39	15	2355	3	1a	7		0	
	39	22	2362	7		0	2r	2	
	39	24	2364	2	1a	30		0	
	39	54	2394	30	1ar	114	2p	114	
	41	48	2508	114	1p	6		0	
	41	54	2514	6		0	2p	12	
	42	6	2526	12	3a	7		0	
	42	13	2533	7		0	2p	7	
	42	20	2540	7	1a	9		0	
	42	29	2549	9		0	2p	3	
	42	32	2552	3	1p	5		0	
	42	37	2557	5		0	2p	5	
	42	42	2562	5	1p	5		0	
	42	47	2567	5		0	2p	1	
	42	48	2568	1	3d	4		0	
	42	52	2572	4		0	2p	3	
	42	55	2575	3	1a	4		0	
	42	59	2579	4		0	2p	11	
	43	10	2590	11	1a	11		0	
	43	21	2601	11		0	2p	4	
	43	25	2605	4	1p	3		0	
	43	28	2608	3		0	2p	14	
	43	42	2622	14	1p	8		0	
	43	50	2630	8		0	2p	7	
	43	57	2637	7	1p	4		0	

RS 4	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENTS DURATION
44	1		2641	4	0	2p 3
44	4		2644	3	1a 26	0
44	30		2670	26	0	2p 10
44	40		2680	10	1a 96	0
46	16		2776	96	0	2p 62
47	18		2838	62	3a 28	0
47	46		2866	28	1a 33	2r 33
48	19		2899	33		

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
	0	0	0		1o	171	2o	171
	2	51	171	171	1ar	46	2r	46
	3	37	217	46		0	2p	23
	4	0	240	23	1a	10		0
	4	10	250	10	1ar	48	2r	48
	4	58	298	48	1a	18		0
	5	16	316	18	1ar	39	2r	39
	5	55	355	39	3a	18		0
	6	13	373	18	1a	7		0
	6	20	380	7		0	2r	49
	7	9	429	49	1a	72		0
	7	32	452	72		0	2r	56
	8	28	508	56		0		0
	8	44	524	16	1a	12		0
RS 2	8	56	536	12		0	2p	11
	9	7	547	11		0	2p	70
	9	54	594	70		0	2p	53
	10	47	647	53	1ar	40	2p	40
	11	27	687	40	1ar	37	2p	37
	12	4	724	37	1p	5		0
	12	9	729	5	1ar	39	2p	39
	12	43	763	39	1a	8		0
	12	51	771	8		0	2p	33
	13	24	804	33	3a	47		0
	13	30	810	47	1a	7		0
	13	37	817	7	1ar	68	2p	68
	14	45	885	68	1a	15		0
	15	0	900	15		0	2p	29
	15	14	914	29	1ar	6	2p	6
	15	20	920	6		0	2p	28
	15	48	948	28	3d	4		0
	15	52	952	4		0	2p	5
	15	57	957	5	3a	2		0
	15	59	959	2		0	2p	13
	16	12	972	13	1ar	12	2p	12
	16	24	984	12	3d	6		0
	16	30	990	6		0	2p	14
	16	44	1004	14	1a	2		0
	16	46	1006	2	3d	12		0
	16	56	1016	12	1ar	21	2p	21
	17	17	1037	21	3d	11		0
	17	28	1048	11		0	2p	48
	17	44	1064	48	1a	9		0

	RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
		17	53	1073	9		0	2p	15
		18	8	1088	15	3d	4		0
		18	12	1092	4		0	2p	4
		18	16	1096	4	3d	4		0
		18	20	1100	4		0	2p	28
		18	48	1128	28		0	1p	13
		19	1	1141	13	1ar	7	2p	7
		19	8	1148	7	1p	4		0
		19	12	1152	4		0	2p	3
		19	15	1155	3	3d	12		0
		19	27	1167	12		0	2p	5
		19	32	1172	5	3a	6		0
		19	38	1178	6		0	2p	12
		19	50	1190	12	1a	49		0
		20	4	1204	49	3d	13		0
		20	17	1217	13		0	2p	17
		20	34	1234	17	3d	10		0
		20	44	1244	10	3a	11		0
		20	55	1255	11		0	2p	50
		21	24	1284	50	3a	4		0
		21	28	1288	4	1a	4		0
		21	32	1292	4		0	2r	3
		21	35	1295	3	1a	9		0
RS 3		21	44	1304	9	1a	30		0
		21	54	1314	30	1ar	21	2r	21
		22	15	1335	21	1ar	110	2r	110
		24	5	1445	110		0	2r	50
		24	55	1495	50	3d	13		0
		25	8	1508	13		0	2r	19
		25	27	1527	19	1a	47		0
		26	14	1574	47	3d	71		0
		27	25	1645	71		0	2r	27
		27	52	1672	27	3a	13		0
		28	5	1685	13	3d	30		0
		28	35	1715	30	1a	20		0
		28	55	1735	20		0	2r	41
		29	36	1776	41	3a	14		0
		29	50	1790	14	1a	25		0
		30	15	1815	25	1a	24		0
		30	39	1839	24	1p	10		0
		30	49	1849	10		0	2p	32
		31	21	1881	32	1ar	124	2r	124
		33	25	2005	124		0	2p	93
		34	58	2098	93	3a	12		0

RS	3	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
	35	10	2110	12	1a	23		0	
	35	33	2133	23	1ar	21	2r	21	
	35	54	2154	21	3a	4		0	
	35	58	2158	4	1ar	72	2r	72	
	37	10	2230	72	1a	13		0	
	37	23	2243	13		0	2p	25	
	37	48	2268	25	1a	9		0	
	37	57	2277	9	1ar	33	2p	33	
	38	30	2310	33	3d	3		0	
	38	33	2313	3	1a	16		0	
	38	49	2329	16	1ar	21	2p	21	
	39	10	2350	21	1ar	58	2p	58	
	40	8	2408	58	1a	12		0	
	40	20	2420	12		0	2p	70	
	41	30	2490	70	3d	8		0	
	41	38	2498	8	1a	12	2o	12	
	41	50	2510	12	1a	149		0	
RS 4	44	19	2659	149	1a	29		0	
	44	48	2688	29	1a	23		0	
	45	11	2711	23		0	2p	14	
	45	25	2725	14	1p	9		0	
	45	34	2734	9		0	2p	9	
	45	43	2743	9	3a	7		0	
	45	50	2750	7	1a	16		0	
	46	6	2766	16		0	2p	7	
	46	13	2773	7	3a	7		0	
	46	20	2780	7		0	2p	30	
	46	50	2810	30	1a	10		0	
	47	0	2820	10		0	2p	29	
	47	29	2849	29	3d	4		0	
	47	33	2853	4	1a	16		0	
	47	49	2869	16		0	2p	6	
	47	55	2875	6	1a	5		0	
	48	0	2880	5		0	2p	29	
	48	29	2909	29	3a	11		0	
	48	40	2920	11	1a	12		0	
	48	52	2932	12		0	2p	14	
	49	6	2946	14	1ar	20	2r	20	
	49	26	2966	20	1p	9		0	
	49	35	2975	9		0	2p	9	
	49	44	2984	9		0		0	

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
	0	0	0		1o	171	2o	171
	2	51	171	171	1ar	46	2r	46
	3	37	217	46		0	2p	23
	4	0	240	23	1a	10		0
	4	10	250	10	1ar	48	2r	48
	4	58	298	48	1a	18		0
	5	16	316	18	1ar	39	2r	39
	5	55	355	39	3a	18		0
	6	13	373	18	1a	7		0
	6	20	380	7		0	2r	49
	7	9	429	49	1a	72		0
	7	32	452	72		0	2r	56
	8	28	508	56		0		0
	8	44	524	16	1a	12		0
RS 2	8	56	536	12		0	2p	11
	9	7	547	11		0	2p	70
	9	54	594	70		0	2p	53
	10	47	647	53	1ar	40	2p	40
	11	27	687	40	1ar	37	2p	37
	12	4	724	37	1p	5		0
	12	9	729	5	1ar	39	2p	39
	12	43	763	39	1a	8		0
	12	51	771	8		0	2p	33
	13	24	804	33	3a	47		0
	13	30	810	47	1a	7		0
	13	37	817	7	1ar	68	2p	68
	14	45	885	68	1a	15		0
	15	0	900	15		0	2p	29
	15	14	914	29	1ar	6	2p	6
	15	20	920	6		0	2p	28
	15	48	948	28	3d	4		0
	15	52	952	4		0	2p	5
	15	57	957	5	3a	2		0
	15	59	959	2		0	2p	13
	16	12	972	13	1ar	12	2p	12
	16	24	984	12	3d	6		0
	16	30	990	6		0	2p	14
	16	44	1004	14	1a	2		0
	16	46	1006	2	3d	12		0
	16	56	1016	12	1ar	21	2p	21
	17	17	1037	21	3d	11		0
	17	28	1048	11		0	2p	48
	17	44	1064	48	1a	9		0

	RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
		17	53	1073	9		0	2p	15
		18	8	1088	15	3d	4		0
		18	12	1092	4		0	2p	4
		18	16	1096	4	3d	4		0
		18	20	1100	4		0	2p	28
		18	48	1128	28		0	1p	13
		19	1	1141	13	1ar	7	2p	7
		19	8	1148	7	1p	4		0
		19	12	1152	4		0	2p	3
		19	15	1155	3	3d	12		0
		19	27	1167	12		0	2p	5
		19	32	1172	5	3a	6		0
		19	38	1178	6		0	2p	12
		19	50	1190	12	1a	49		0
		20	4	1204	49	3d	13		0
		20	17	1217	13		0	2p	17
		20	34	1234	17	3d	10		0
		20	44	1244	10	3a	11		0
		20	55	1255	11		0	2p	50
		21	24	1284	50	3a	4		0
		21	28	1288	4	1a	4		0
		21	32	1292	4		0	2r	3
		21	35	1295	3	1a	9		0
RS 3		21	44	1304	9	1a	30		0
		21	54	1314	30	1ar	21	2r	21
		22	15	1335	21	1ar	110	2r	110
		24	5	1445	110		0	2r	50
		24	55	1495	50	3d	13		0
		25	8	1508	13		0	2r	19
		25	27	1527	19	1a	47		0
		26	14	1574	47	3d	71		0
		27	25	1645	71		0	2r	27
		27	52	1672	27	3a	13		0
		28	5	1685	13	3d	30		0
		28	35	1715	30	1a	20		0
		28	55	1735	20		0	2r	41
		29	36	1776	41	3a	14		0
		29	50	1790	14	1a	25		0
		30	15	1815	25	1a	24		0
		30	39	1839	24	1p	10		0
		30	49	1849	10		0	2p	32
		31	21	1881	32	1ar	124	2r	124
		33	25	2005	124		0	2p	93
		34	58	2098	93	3a	12		0

RS	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
	35	10	2110	12	1a	23	0	
	35	33	2133	23	1ar	21	2r	21
	35	54	2154	21	3a	4		0
	35	58	2158	4	1ar	72	2r	72
	37	10	2230	72	1a	13		0
	37	23	2243	13		0	2p	25
	37	48	2268	25	1a	9		0
	37	57	2277	9	1ar	33	2p	33
	38	30	2310	33	3d	3		0
	38	33	2313	3	1a	16		0
	38	49	2329	16	1ar	21	2p	21
	39	10	2350	21	1ar	58	2p	58
	40	8	2408	58	1a	12		0
	40	20	2420	12		0	2p	70
	41	30	2490	70	3d	8		0
	41	38	2498	8	1a	12	2o	12
	41	50	2510	12	1a	149		0
RS 4	44	19	2659	149	1a	29		0
	44	48	2688	29	1a	23		0
	45	11	2711	23		0	2p	14
	45	25	2725	14	1p	9		0
	45	34	2734	9		0	2p	9
	45	43	2743	9	3a	7		0
	45	50	2750	7	1a	16		0
	46	6	2766	16		0	2p	7
	46	13	2773	7	3a	7		0
	46	20	2780	7		0	2p	30
	46	50	2810	30	1a	10		0
	47	0	2820	10		0	2p	29
	47	29	2849	29	3d	4		0
	47	33	2853	4	1a	16		0
	47	49	2869	16		0	2p	6
	47	55	2875	6	1a	5		0
	48	0	2880	5		0	2p	29
	48	29	2909	29	3a	11		0
	48	40	2920	11	1a	12		0
	48	52	2932	12		0	2p	14
	49	6	2946	14	1ar	20	2r	20
	49	26	2966	20	1p	9		0
	49	35	2975	9		0	2p	9
	49	44	2984	9		0		0

RS 1	MINUTES	SECONDS	T-SECONDS	INTERVALS	TEACHER DURATION	STUDENT DURATION	DURATION
0	20	20		1o	40		0
1	0	60	40	1a	17	2o	17
1	17	77	17	1a	53		0
2	10	130	53		0	2r	30
2	40	160	30	3d	9		0
2	49	169	9	1ar	68	2r	68
3	57	237	68	1ar	13	2r	13
4	10	250	13	1ar	125	2r	125
6	15	375	125	1ar	37	2r	37
6	52	412	37	1a	14		0
7	6	426	14	1ar	4	2r	4
7	10	430	4	1ar	42	2r	42
7	52	472	42	1ar	17	2r	17
8	9	489	17	1ar	9	2r	9
8	18	498	9	1ar	9	2r	9
8	27	507	9		0	2p	36
9	3	543	36	1p	17		0
9	20	560	17		0	2p	55
10	15	615	55		15	2p	15
10	30	630	15	1a	21		0
10	51	651	21		0	2p	19
11	10	670	19	1p	2		0
11	12	672	2		0	2p	23
11	35	695	23	1a	5		0
11	40	700	5		0	2p	11
11	51	711	11	3d	30		0
12	10	730	30	1a	13		0
12	23	743	13		0	2p	41
13	4	784	41	1p	2		0
13	6	786	2		0	2p	42
13	48	828	42		26	2p	26
14	14	854	26	1a	6		0
14	20	860	6		26	2p	26
14	40	880	26	1ar	30	2p	30
15	10	910	30	1a	16		0
15	26	926	16		0	2p	25
15	51	951	25	1p	15		0
16	6	966	15		0	2p	37
16	43	1003	37	1a	3		0
16	46	1006	3		0	2p	22
17	8	1028	22	1a	11		0
17	18	1038	35		0	2p	73
17	59	1079	73	1a	4		0

RS 1	MINUTES	SECONDS	T-SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
	18	3	1083	4		16	2p	16
	18	15	1095	16	3d	14		0
	18	29	1109	14		0	2p	54
	19	23	1163	54	1ar	11	2p	11
	19	34	1174	11	1a	36		0
	20	10	1210	36		0	2p	34
	20	44	1244	34	1p	4		0
	20	48	1248	4		36	2p	36
	21	20	1280	36	1a	14		0
	21	34	1294	14		0	2p	58
	22	32	1352	58	1p	3		0
	22	35	1355	3		45	2p	45
	23	20	1400	45	1a	12		0
	23	32	1412	12		0	2p	4
	23	36	1416	4	3d	22		0
	23	42	1422	22		0	2p	18
	24	0	1440	18	1a	15		0
	24	15	1455	15	1ar	94	2p	94
	25	49	1549	94	3a	4		0
	25	53	1553	4		0	2p	31
	26	24	1584	31	1o	23	2o	23
RS 2	26	47	1607	23	1a	9	2o	9
	26	56	1616	9		0	2p	34
	27	30	1650	34	1a	18		0
	27	48	1668	18		0	2p	7
	27	55	1675	7	3d	3		0
	27	58	1678	3	1p	8		0
	28	6	1686	8		0	2p	2
	28	8	1688	2	1a	42		0
	28	50	1730	42		0	2p	10
	29	0	1740	10	3a	4		0
	29	4	1744	4		0	2p	8
	29	12	1752	8	1a	10		0
	29	22	1762	10		0	2p	10
	29	32	1772	10	1a	9		0
	29	41	1781	9		0	2p	9
	29	50	1790	9	1a	15		0
	30	5	1805	15		0	2p	5
	30	10	1810	5	3d	6		0
	30	16	1816	6		0	2p	23
	30	28	1828	23	3a	13		0
	30	41	1841	13		0	2p	1
	30	42	1842	1	1a	22		0
	31	4	1864	22		0	2p	36
RS 3	31	40	1900	36	1a	32		0
	32	12	1932	32		0	2p	12

RS	3	MINUTES	SECONDS	TSECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
32	24	1944	12	1a	36			0	
33	0	1980	36	1a	5			0	
33	5	1985	5		0	2p		9	
33	14	1994	9	1p	9			0	
33	23	2003	9		0	2p		9	
33	32	2012	9	1a	2			0	
33	34	2014	2		10	2p		10	
33	42	2022	10	1a	14			0	
33	56	2036	14		0	2p		5	
34	1	2041	5	3d	6			0	
34	7	2047	6		0	2p		8	
34	15	2055	8	1a	8			0	
34	23	2063	8		0	2r		7	
34	30	2070	7	3d	8			0	
34	38	2078	8		0	2p		8	
34	46	2086	8	3a	20			0	
34	50	2090	20		0	2p		10	
35	0	2100	10	1a	30			0	
35	30	2130	30		0	2p		10	
35	40	2140	10	1a	9			0	
35	49	2149	9		0	2p		31	
36	20	2180	31	1ar	22	2r		22	
36	42	2202	22		0	2p		6	
36	48	2208	6	1a	72			0	
38	0	2280	72		0	2p		10	
38	10	2290	10	3d	6			0	
38	16	2296	6		0	2p		4	
38	20	2300	4	3d	35			0	
38	55	2335	35	1ar	27	2p		27	
39	22	2362	27	1p	2			0	
39	24	2364	2		11	2p		11	
39	33	2373	11	1p	12			0	
39	45	2385	12	1ar	3	2r		3	
39	48	2388	3	1p	8	2s		8	
39	56	2396	8	3d	8			0	
40	4	2404	8	1p	12			0	
40	16	2416	12		0	2p		12	
40	28	2428	12	1a	32			0	
41	0	2460	32		0	2p		15	
41	15	2475	15	1a	21			0	
41	36	2496	21		0	2p		13	
41	49	2509	13	1ar	11	2p		11	
42	0	2520	11	1a	18			0	
42	18	2538	18	1ar	16	2p		16	

	RS 3	MINUTES	SECONDS	T-SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION
	42	34	2554	16	1a	11		0
	42	45	2565	11		0	2p	38
	43	23	2603	38	1a	12		0
	43	35	2615	12	3d	6	2o	6
	43	41	2621	6	1a	9		0
	43	50	2630	9		0	2p	8
	43	58	2638	8	1d	2		0
	44	0	2640	2	1p	15		15
	44	15	2655	15		0	2p	35
	44	50	2690	35	1o	38	2o	38
RS 4	45	28	2728	38	1a	3	2o	3
	45	31	2731	3	1p	11		0
	45	42	2742	11		0	2p	32
	46	14	2774	32	1a	38		0
	46	52	2812	38		0	2p	8
	47	0	2820	8	3d	9		0
	47	9	2829	9		0	2p	6
	47	15	2835	6	1a	21		0
	47	36	2856	21	3a	14	2p	14
	47	50	2870	14	1a	24		0
	48	14	2894	24		0	2p	8
	48	22	2902	8	1a	12		0
	48	34	2914	12	1ar	32	2p	32
	49	6	2946	32	1a	9		0
	49	15	2955	9		0	2p	3
	49	18	2958	3	1p	12		0
	49	30	2970	12		0	2p	9
	49	39	2979	9	1a	6		0
	49	45	2985	6	1ar	35	2p	35
	50	14	3014	35		0	2p	9
	50	23	3023	9	1p	10		0
	50	33	3033	10		0	2p	12
	50	45	3045	12	3d	3		0
	50	48	3048	3	1a	18		0
	51	3	3063	18		0	2p	9
	51	12	3072	9	1a	34		0
	51	46	3106	34	1a	8		0
	51	54	3114	8		0	2p	18
	52	12	3132	18	1a	8		0
	52	20	3140	8		0	2p	13
	52	33	3153	13	1a	18		0
	52	51	3171	18		0	2p	9
	53	0	3180	9	1a	8		0
	53	8	3188	8		0		0

RS 1	MINUTES	SECONDS	T-SECONDS	INTERVALS	TEACHER	DURATION	STUDENT	DURATION
0	0	0	0			0	2o	4
0	4	4	4	4	1ar	126	2r	126
2	10	130	126			0	2r	57
3	7	187	57		1o	9	2o	9
3	16	196	9		1a	18	2r	18
3	34	214	18		1ar	8	2r	8
3	42	222	8		1o	8		0
3	50	230	8		1a	5		0
3	55	235	5			0	2r	23
4	18	258	23		1p	5		0
4	23	263	5			0	2r	7
4	30	270	7		1a	5		0
4	35	275	5			10	2r	10
4	45	285	10		1a	6		0
4	51	291	6		1ar	29	2p	29
5	20	320	29		1p	7		0
5	27	327	7			0		11
5	38	338	11			0	2p	33
6	11	371	33		1p	4		0
6	15	375	4		1ar	13	2p	13
6	28	388	13		3d	7		0
6	35	395	7			0	2p	15
6	50	410	15		1a	7		0
6	57	417	7			0	2p	27
7	24	444	27		1d	5		0
7	29	449	5			0	2p	65
8	34	514	65		1p	5		0
8	39	519	5			0	2p	38
9	17	557	38		1p	5		0
9	22	562	5			0	2p	10
9	32	572	10		3d	7		0
9	39	579	7			0	2p	11
9	50	590	11		1ar	26	2r	26
10	16	616	26			0	2p	20
10	36	636	20		1a	24		0
11	0	660	24			0	2p	33
11	33	693	33		1p	4		0
11	37	697	4			0	2p	42
12	19	739	42		1p	3		0
12	22	742	3			0	2p	13
12	35	755	13		1a	32		0
13	7	787	32			11	2p	8
13	15	795	8		1a	11		0

	MINUTES	SECONDS	T-SECONDS	INTERVALS	TEACHER	DURATION	STUDENT	DURATION
RS 1	13	26	806	11		0	2p	56
	14	22	862	56	1a	13		0
	14	35	875	13		0	2p	35
	15	10	910	35	1p	6		0
	15	16	916	6		0	2p	26
RS 2	15	42	942	26		0	2s	48
	16	30	990	48	1a	4		0
	16	34	994	4		0	2p	30
	17	4	1024	30	1a	25		0
	17	29	1049	25		0	2p	29
	17	58	1078	29	1a	14		0
	18	12	1092	14		0	2p	26
	18	38	1118	26	1a	17		0
	18	55	1135	17		0	2p	29
	19	24	1164	29	1ar	30	2r	30
	19	54	1194	30	1a	15		0
	20	9	1209	15		0	2p	14
	20	23	1223	14	1a	26		0
	20	49	1249	26		0	2p	28
	21	17	1277	28	1a	28		0
	21	45	1305	28		0	2p	5
	21	50	1310	5	1a	13		0
	22	3	1323	13	1p	4		0
	22	7	1327	4		0	2p	2
	22	9	1329	2	1a	3		0
	22	12	1332	3		0	2p	5
	22	17	1337	5	1a	2		0
	22	19	1339	2		0	2p	6
	22	25	1345	6	1a	17		0
	22	42	1362	17		0	2p	2
	22	44	1364	2	3d	8		0
	22	52	1372	8		0	2p	26
	23	18	1398	26	1a	16		0
	23	34	1414	16	1ar	30	2p	30
	24	4	1444	30	3a	23		0
	24	4	1444	30	1a	23	2s	23
	24	27	1467	23		0	2p	27
	24	54	1494	27	1a	6		0
	25	0	1500	6		0	2p	10
	25	10	1510	10	1a	21		0
	25	31	1531	21		0	2p	9
	25	40	1540	9	3a	6		0
RS 3	25	46	1546	6	1o	30	2o	30
	26	16	1576	30	1a	7		0

RS 3	MINUTES	SECONDS	T-SECONDS	INTERVALS	TEACHER	DURATION	STUDENT	DURATION
	26	23	1583	7		0	2p	15
	26	38	1598	15	1a	28		0
	27	6	1626	28		0	2p	14
	27	20	1640	14	3d	12		0
	27	32	1652	12		0	2p	7
	27	39	1659	7	3a	15		0
	27	54	1674	15		0	2p	32
	28	26	1706	32	1a	13		0
	28	39	1719	13		0	2p	2
	28	41	1721	2	1a	10		0
	28	51	1731	10		0	2p	5
	28	56	1736	5	1a	7		0
	29	3	1743	7		0	2p	32
	29	35	1775	32	1a	19		0
	29	54	1794	19		0	2p	4
	29	58	1798	4	1o	13	2o	13
	30	11	1811	13		0	2p	10
	30	21	1821	10	1a	25		0
	30	46	1846	25		0	2p	7
	30	53	1853	7	1a	37		0
	31	30	1890	37		0	2p	16
	31	46	1906	16	1a	35		35
	32	21	1941	35		0	2p	39
	33	0	1980	39	1a	18		0
	33	18	1998	18		0	2p	10
	33	28	2008	10	1a	2		0
	33	30	2010	2		0	2p	4
	33	32	2012	4	1a	23		0
	33	55	2035	23		0	2p	9
	34	4	2044	9	3d	11		0
	34	15	2055	11		0	2p	20
	34	35	2075	20	1a	11		0
	34	46	2086	11		0	2p	4
	34	50	2090	4	1a	20		0
	35	10	2110	20		0	2p	13
	35	23	2123	13	3a	28		0
RS 4	35	51	2151	28	1p	51		0
	36	42	2202	51		0	2p	26
	37	8	2228	26	1a	21		0
	37	29	2249	21		0	2p	13
	37	42	2262	13	1p	12		0
	37	54	2274	12	1a	8		0
	38	2	2282	8		0	2p	12
	38	14	2294	12	1a	34		0

RS 4	MINUTES	SECONDS	T-SECONDS	INTERVALS	TEACHER	DURATION	STUDENT	DURATION
	38	48	2328	34		0	2p	23
	39	11	2351	23	1a	15		0
	39	26	2366	15		0	2p	8
	39	34	2374	8	1a	3		0
	39	37	2377	3		0	2p	16
	39	53	2393	16	1a	11		0
	40	4	2404	11		0	2p	6
	40	10	2410	6	1a	5		0
	40	15	2415	5		0	2p	8
	40	23	2423	8	1o	15		0
	40	38	2438	15	1a	6		0
	40	44	2444	6	1a	7		0
	40	51	2451	7		0	2p	51
	41	42	2502	51	1a	12		0
	41	54	2514	12		0	2p	9
	42	3	2523	9	3d	9		0
	42	12	2532	9	1a	14		0
	42	26	2546	14		0	2p	27
	42	53	2573	27	1a	67		0
	43	33	2613	67	1ar	57	2p	57
	44	30	2670	57	1a	11		0
	44	41	2681	11		0	2p	24
	45	5	2705	24	1a	29		0
	45	34	2734	29	1ar	30	2p	30
	46	4	2764	30	3a	10		0
	46	14	2774	10		0	2p	26
	46	40	2800	26	3d	28		0
	47	8	2828	28	1ar	37	2p	37
	47	45	2865	37	3d	3		0
	47	48	2868	3		0	2p	4
	47	52	2872	4	1a	6		0
	47	58	2878	6		0		0

ACTIVITY	MINUTES	SECONDS	T-SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
RS 1	0		0	0	1o	12	2o	12
	0	12	12	12	1p	2		0
	0	14	14	2		0	2p	38
	0	52	52	38	1p	7		0
	0	59	59	7		0	2p	36
	1	35	95	36	1a	19		0
	1	54	114	19		2	2p	2
	1	56	116	2	1a	7		0
	2	3	123	7		0	2p	46
	2	49	169	46	1a	4		0
	2	53	173	4		0	2p	4
	2	57	177	4	3a	9		0
	3	6	186	9	1a	10		0
	3	16	196	10		0	2p	8
	3	24	204	8	1a	6		0
	3	30	210	6		0	2p	8
	3	38	218	8	3a	2		0
	3	40	220	2		0	2p	25
	4	5	245	25	1p	4		0
	4	9	249	4		0	2p	40
	4	49	289	40	1a	9		0
	4	58	298	9		0	2p	5
	5	3	303	5	1a	7		0
	5	10	310	7		0	2p	25
	5	35	335	25	3a	6		0
	5	41	341	6	1a	13		0
	5	54	354	13		0	2p	5
	5	59	359	5	1p	4		0
	6	3	363	4		0	2p	5
	6	8	368	5	1a	3		0
	6	11	371	3		0	2p	3
	6	14	374	3	1p	12		0
	6	26	386	12		0	2p	7
	6	33	393	7	3a	4		0
	6	37	397	4		0	2p	2
	6	39	399	2	1a	3		0
	6	42	402	3		0	2p	4
	6	46	406	4	1a	8		0
	6	54	414	8		0	2p	4
	6	58	418	4	1a	33		0
	7	31	451	33		0	2p	2
	7	33	453	2	1a	2		0
	7	35	455	2		0	2p	12

RS 1	MINUTES	SECONDS	T-SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION
	7	47	467	12	1a	6	0
	7	53	473	6		0	2p 3
	7	56	476	3	1a	7	0
	8	3	483	7	1p	13	0
	8	16	496	13		0	2p 3
	8	19	499	3	3d	5	0
	8	24	504	5		0	2p 4
	8	28	508	4	3a	4	0
	8	32	512	4	1ar	11	2p 11
	8	43	523	11	1a	3	0
	8	46	526	3		0	2p 11
	8	57	537	11	1a	3	0
	9	0	540	3		0	2p 7
	9	7	547	7	1a	4	0
	9	11	551	4		0	2p 8
	9	19	559	8	1a	12	0
	9	31	571	12	1ar	27	2p 27
	9	58	598	27	3a	3	3
	10	2	602	4	1a	3	0
RS 2	10	5	605	3		47	2o 47
	10	52	652	47	1p	20	0
	11	12	672	20	1a	4	2o 4
	11	16	676	4	1a	16	0
	11	32	692	16	1a	15	2o 15
	11	47	707	15	1a	20	0
	12	7	727	20		0	2p 103
	13	50	830	103	1ar	79	2r 79
	15	9	909	79	1p	6	0
	15	15	915	6		0	2r 3
	15	18	918	3	1a	4	0
	15	22	922	4		0	2r 12
	15	34	934	12	1a	90	0
	17	4	1024	90		0	2p 32
	17	36	1056	32	3a	16	0
	17	52	1072	16	1a	22	0
	18	14	1094	22	1p	23	0
	18	37	1117	23		0	2p 30
	19	7	1147	30	3a	14	0
	19	21	1161	14		0	2p 20
	19	41	1181	20	3a	8	0
	19	49	1189	8		0	2p 2
	19	51	1191	2	1a	6	0
	19	57	1197	6		0	2p 20
	20	17	1217	20	1a	43	0

RS 2	MINUTES	SECONDS	T-SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
	21	0	1260	43		0	2p	12
	21	12	1272	12	3a	8		0
	21	20	1280	8	1a	34		0
	21	54	1314	34		0	2p	7
	22	1	1321	7	3d	10		0
	22	11	1331	10		0	2p	11
	22	22	1342	11	3a	7		0
	22	29	1349	7	1a	13		0
	22	42	1362	13		0	2p	13
	22	55	1375	13	1a	19	2o	19
	23	14	1394	19	1a	2		0
	23	16	1396	2		0	2p	4
	23	20	1400	4	1a	5		0
	23	25	1405	5		0	2p	3
	23	28	1408	3	1p	7		0
	23	35	1415	7		0	2p	2
	23	37	1417	2	1a	3		0
	23	40	1420	3		0	2p	2
	23	42	1422	2	1a	15		0
	23	57	1437	15		0	2p	3
	24	0	1440	3	3a	3		0
	24	3	1443	3		0	2p	67
	25	10	1510	67	1a	29		0
	25	39	1539	29		0	2p	8
	25	47	1547	8	1a	10		0
	25	57	1557	10		0	2p	8
	26	5	1565	8	3a	10		0
	26	15	1575	10		0	2p	7
	26	22	1582	7	1a	17		0
	26	39	1599	17		0	2p	59
	27	38	1658	59	3a	13		0
RS 3	27	51	1671	13	1a	45	2o	45
	28	36	1716	45	1ar	33	2o	33
	29	9	1749	33		0	2r	37
	29	46	1786	37	1a	26		0
	30	12	1812	26		0	2p	8
	30	20	1820	8	1a	28		0
	30	48	1848	28		0	2p	38
	31	26	1886	38	1p	8		0
	31	34	1894	8		0	2p	3
	31	37	1897	3	3a	12		0
	31	49	1909	12		0	2p	56
	32	45	1965	56	1a	11		0
	32	56	1976	11		0	2p	4

RS 3	MINUTES	SECONDS	T-SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
	33	0	1980	4	1p	4		0
	33	4	1984	4		0	2p	5
	33	9	1989	5	1a	9		0
	33	18	1998	9		0	2p	3
	33	21	2001	3	3a	2		0
	33	23	2003	2	1a	9		0
	33	32	2012	9		0	2p	39
	34	11	2051	39	1a	27		0
	34	38	2078	27		0	2p	76
	35	54	2154	76		0	2r	74
	37	8	2228	74		0	2p	38
	37	46	2266	38	1p	12		0
	37	58	2278	12	1a	25		0
	38	23	2303	25		0	2p	2
	38	25	2305	2	1a	3		0
	38	28	2308	3		0	2p	3
	38	31	2311	3	1a	5		0
	38	36	2316	5		0	2p	13
	38	49	2329	13	1a	3		0
	38	52	2332	3		0	2p	14
	39	6	2346	14	3a	11		0
	39	17	2357	11		0	2p	2
	39	19	2359	2	1a	5		0
	39	24	2364	5		0	2p	16
	39	40	2380	16	3a	4		0
	39	44	2384	4		0	2p	5
	39	49	2389	5	1a	5		0
	39	54	2394	5		0	2p	14
	40	8	2408	14	3a	5		0
	40	13	2413	5	1a	17	2o	17
	40	30	2430	17	1a	60		0
RS 4	41	30	2490	60	1a	65	2s	65
	42	35	2555	65	1a	55		0
	43	30	2610	55	1p	60		0
	44	30	2670	60		0	2p	43
	45	13	2713	43	1a	29		0
	45	42	2742	29		0	2p	8
	45	50	2750	8	1a	41		0
	46	31	2791	41		0	2o	49
RS 5	47	20	2840	49	1a	50	2o	50
	48	10	2890	50	1p	13		0
	48	23	2903	13		0	2p	57
	49	20	2960	57	1a	10		0
	49	30	2970	10		0	2p	18
	49	48	2988	18		1619		1797

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
	0	0	0		0	2o	26	
	0	26	26	26	1o	16	0	
	0	42	42	16	1p	18	2o	18
	1	0	60	18	1a	27		0
	1	27	87	27	1a	13		0
	1	34	94	13		0	2p	50
	2	24	144	50	1a	4		0
	2	28	148	4		0	2p	31
	2	59	179	31	3d	12		0
	3	11	191	12		0	2p	7
	3	18	198	7	3d	2		0
	3	20	200	2		0	2p	16
	3	36	216	16	1a	18		0
	3	54	234	18	1ar	36	2p	36
	4	30	270	36	3a	6		0
	4	36	276	6	1a	8		0
	4	44	284	8		0	2p	12
	4	56	296	12	3a	42		0
RS 2	5	38	338	42	1a	32		0
	6	10	370	32	1p	26		0
	6	36	396	26		0	2p	12
	6	48	408	12	1a	21		0
	7	9	429	21	1p	16		0
	7	25	445	16		0	2p	4
	7	29	449	4	1a	13		0
	7	42	462	13		0	2p	13
	7	55	475	13	3a	10		0
	7	58	478	3	1a	3		0
	8	8	488	10		0	2r	17
	8	25	505	17		0	2p	12
	8	37	517	12	1a	16		0
	8	53	533	16		0	2p	15
	9	8	548	15	1a	15		0
	9	23	563	15		0	2p	13
	9	36	576	13	1a	20		0
	9	56	596	20		0	2r	16
	10	12	612	16		0	2p	20
	10	32	632	20	3a	8		0
	10	40	640	8		0	2p	11
	10	51	651	11	1a	24		0
	11	15	675	24		0	2p	15
	11	30	690	15	1a	13		0
	11	43	703	13		0	2p	11

	RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
		11	54	714	11	1ar	6	2p	6
		12	0	720	6	3a	4		0
		12	4	724	4		0	2p	8
		12	12	732	8	3a	6		0
		12	16	736	4	1a	4		0
		12	22	742	6		0	2r	6
		12	28	748	6	3a	10		0
		12	38	758	10		0	2p	7
		12	45	765	7	1a	6		0
		12	51	771	6		0	2p	8
		12	59	779	8	1p	10		0
		13	9	789	10		0	2p	8
		13	17	797	8	1a	10		0
		13	27	807	10		0	2p	9
		13	36	816	9		0		0
		13	42	822	6	1a	8		0
		13	50	830	8		0	2r	10
		14	0	840	10		0	2p	10
		14	10	850	10	1a	7		0
		14	17	857	7		0	2p	9
		14	26	866	9	3a	10		0
		14	36	876	10		0	2o	30
RS 3		15	6	906	30	1a	6		0
		15	12	912	6		0	2p	86
		16	38	998	86	1a	10		0
		16	48	1008	10	1p	6		0
		16	54	1014	6		0	2r	4
		16	58	1018	4	1a	18		0
		17	16	1036	18		0	2r	8
		17	24	1044	8	1a	15		0
		17	39	1059	15		0	2r	28
		18	7	1087	28	1a	27		0
		18	34	1114	27		0	2r	9
		18	43	1123	9	3a	13		0
		18	46	1126	3	3d	13		0
		18	59	1139	13		0	2p	2
		19	1	1141	2	1a	2		0
		19	3	1143	2		0	2p	24
		19	27	1167	24	1a	15		0
		19	42	1182	15		0	2p	36
		20	18	1218	36	1a	11		0
		20	29	1229	11		0	2p	5
		20	34	1234	5	1a	2		0
		20	36	1236	2		0	2p	7

RS 3	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
20	43	1243	7	1p	4		0	
20	47	1247	4		0	2p	7	
20	54	1254	7	3a	2		0	
20	56	1256	2	1p	5		0	
21	1	1261	5		0	2p	4	
21	5	1265	4	3a	11		0	
21	16	1276	11		0	2p	8	
21	24	1284	8	1a	4		0	
21	28	1288	4		0	2p	6	
21	34	1294	6	3a	8		0	
21	42	1302	8		0	2p	7	
21	49	1309	7	3d	15		0	
22	4	1324	15		0	2p	32	
22	36	1356	32	1a	12		0	
22	48	1368	12		0	2p	22	
23	10	1390	22	1ar	27	2p	27	
23	37	1417	27		0	2p	48	
24	25	1465	48	3a	8		0	
24	33	1473	8	1a	44		0	
25	17	1517	44		0	2p	5	
25	22	1522	5	3a	6		0	
25	28	1528	6		0	2p	29	
25	57	1557	29	1a	13		0	
26	10	1570	13		0	2p	4	
26	14	1574	4	1a	7		0	
26	21	1581	7		0	2p	3	
26	24	1584	3	1a	7		0	
26	31	1591	7		0	2p	3	
26	34	1594	3	1a	8		0	
26	42	1602	8		0	2p	3	
26	45	1605	3	1a	7		0	
26	52	1612	7		0	2p	8	
27	0	1620	8	1p	26		0	
27	26	1646	26		0	2p	4	
27	30	1650	4	1a	5		0	
27	35	1655	5		0	2p	3	
27	38	1658	3	3a	3		0	
27	41	1661	3		0	2p	8	
27	49	1669	8	1a	5	2p	5	
27	54	1674	5	3d	8		0	
28	2	1682	8		0	2p	10	
28	12	1692	10	3a	5		0	
28	17	1697	5		0	2p	11	
28	28	1708	11	1a	4		0	

	RS 3	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION
		28	32	1712	4	0	2p 9
		28	41	1721	9	3a 4	0
		28	45	1725	4	0	2p 5
		28	50	1730	5	1a 2	0
		28	52	1732	2	0	2r 10
		29	2	1742	10	0	2p 7
RS 4		29	9	1749	7	1o 51	0
		30	0	1800	51	1a 53	2o 53
		30	53	1853	53	1a 9	0
		31	2	1862	9	0	2p 128
		33	10	1990	128	3a 17	0
		33	27	2007	17	1a 71	0
		34	38	2078	71	1p 6	0
		34	44	2084	6	1a 26	0
		35	10	2110	26	0	2p 4
		35	14	2114	4	1a 22	0
		35	36	2136	22	0	2p 5
		35	41	2141	5	1a 15	0
		35	56	2156	15	0	2p 8
		36	4	2164	8	1a 6	0
		36	10	2170	6	0	2r 4
		36	14	2174	4	1a 11	0
		36	25	2185	11	0	2p 6
		36	31	2191	6	1a 5	0
		36	36	2196	5	0	2p 12
		36	48	2208	12	3a 5	0
		36	53	2213	5	0	2p 2
		36	55	2215	2	1a 2	0
		36	57	2217	2	0	2p 8
		37	5	2225	8	1a 4	0
		37	9	2229	4	0	2p 14
		37	23	2243	14	1a 12	0
		37	35	2255	12	0	2p 8
		37	43	2263	8	3a 35	0
		38	18	2298	35	0	2p 4
		38	22	2302	4	1a 3	0
		38	25	2305	3	0	2p 18
		38	43	2323	18	1a 11	0
		38	54	2334	11	0	2p 5
		38	59	2339	5	1a 3	0
		39	2	2342	3	0	2p 7
		39	9	2349	7	1a 11	0
		39	20	2360	11	1p 15	0
		39	35	2375	15	0	2p 6

RS 4	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
39	41	2381	6	3a	13		13	
39	54	2394	13		0	2p	4	
39	58	2398	4	3a	8		0	
40	6	2406	8		0	2p	5	
40	11	2411	5	1ar	7	2p	7	
40	18	2418	7	1p	8		0	
40	26	2426	8	1a	9		0	
40	35	2435	9		0	2p	20	
40	55	2455	20	3d	9		0	
41	4	2464	9		0	2p	19	
41	23	2483	19	1a	12		0	
41	35	2495	12		0	2p	19	
41	54	2514	19	1a	39		0	
42	33	2553	39		0	2p	17	
42	50	2570	17	1a	13		0	
43	3	2583	13		0	2r	18	
43	21	2601	18	3a	9		0	
43	30	2610	9		0	2p	13	
43	43	2623	13	3d	7		0	
43	50	2630	7		0	2p	14	
44	4	2644	14	1a	14		0	
44	18	2658	14		0	2p	6	
44	24	2664	6	1a	9		0	
44	33	2673	9		0	2p	3	
44	36	2676	3	1a	12		0	
44	48	2688	12		0	2p	11	
44	59	2699	11	1a	9		0	
45	8	2708	9		0	2p	4	
45	12	2712	4	1a	6		0	
45	18	2718	6		0	2p	45	
46	3	2763	45	1a	9		0	
46	12	2772	9		0	2r	8	
46	20	2780	8	1p	11		0	
46	31	2791	11		0	2p	5	
46	36	2796	5	1p	9		0	
46	45	2805	9		0	2p	5	
46	50	2810	5	1a	17		0	
47	7	2827	17		0	2p	25	
47	32	2852	25	1a	9		0	
47	41	2861	9		0	2p	27	
48	8	2888	27	3a	7		0	
48	15	2895	7		1527		1543	

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION
0	0	0	0	1d	60	2s	60
1	0	60	60	1ar	32	2r	32
1	32	92	32	1a	24		0
1	56	116	24	1ar	40	2r	40
2	36	156	40	1a	4		0
2	40	160	4		0	2r	27
3	7	187	27	1a	2		0
3	9	189	2		0	2r	7
3	16	196	7	3d	10		0
3	26	206	10		0	2r	10
3	36	216	10	3a	2		0
3	38	218	2	1p	4		0
3	42	222	4		0	2p	18
4	0	240	18	1p	4		0
4	4	244	4		0	2p	6
4	10	250	6	1p	5		0
4	15	255	5		0	2p	11
4	26	266	11	1ar	9	2r	9
4	35	275	9	1a	8		0
4	43	283	8		0	2p	21
5	4	304	21	3a	11		0
5	15	315	11		0	2p	13
5	28	328	13	3d	10		0
5	38	338	10	1a	5		0
5	43	343	5		0	2p	23
6	6	366	23	1a	9		0
6	15	375	9		0	2p	40
6	55	415	40	1a	15		0
7	10	430	15		0	2p	15
RS 2 7	25	445	15	1a	23		0
7	48	468	23	1a	23		0
8	11	491	23		0	2r	39
8	50	530	39	1ar	27	2r	27
9	17	557	27	1a	41		0
9	58	598	41	1p	12		0
10	10	610	12	3a	8		0
10	18	618	8		0	2p	22
10	40	640	22	3a	2		0
10	42	642	2	1a	14		0
10	56	656	14	1pr	92	2p	92
12	28	748	92	1ar	50	2r	50
13	18	798	50		0	2r	52
14	10	850	52	1a	43		0

	RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION
		14	53	893	43	0	2r 34
		15	27	927	34	3d 18	0
		15	45	945	18	1d 20	0
		16	5	965	20	1a 24	0
		16	29	989	24	1a 11	0
RS 3		16	40	1000	11	1p 8	0
		16	48	1008	8	0	2p 3
		16	51	1011	3	3d 12	0
		17	3	1023	12	1p 11	0
		17	14	1034	11	0	2p 10
		17	24	1044	10	3d 22	0
		17	46	1066	22	0	2r 4
		17	50	1070	4	3a 10	0
		18	0	1080	10	1a 35	0
		18	35	1115	35	0	2p 11
		18	46	1126	11	1pr 47	2r 47
		19	33	1173	47	3a 32	0
		20	5	1205	32	1a 53	0
		20	58	1258	53	0	2p 54
		21	52	1312	54	3d 10	0
		22	2	1322	10	1a 27	0
		22	29	1349	27	0	2p 20
		22	49	1369	20	3a 7	0
		22	56	1376	7	1s 19	2r 19
RS 4		23	15	1395	19	1d 5	0
		23	20	1400	5	3sd 2	0
		23	22	1402	2	3a 6	0
		23	28	1408	6	1ar 22	2p 22
		23	50	1430	22	3d 26	0
		24	16	1456	26	1a 17	0
		24	33	1473	17	0	2p 7
		24	40	1480	7	3a 3	0
		24	43	1483	3	1a 7	0
		24	50	1490	7	3sd 2	0
		24	52	1492	2	1d 20	0
		25	12	1512	20	1a 6	0
		25	18	1518	6	0	2p 4
		25	22	1522	4	1a 8	0
		25	30	1530	8	0	2p 2
		25	32	1532	2	3a 1	0
		25	33	1533	1	1a 23	0
		25	56	1556	23	0	2p 14
		26	10	1570	14	1a 11	0
		26	21	1581	11	0	2r 1

RS 4	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
	26	22	1582	1	1a	7		0
	26	29	1589	7		0	2r	3
	26	32	1592	3	1a	4		0
	26	36	1596	4		0	2r	8
	26	44	1604	8	1pr	3	2r	3
	26	47	1607	3	1a	73		0
	28	0	1680	73	1a	12		0
	28	12	1692	12		0	2p	10
	28	22	1702	10	3d	14		0
	28	36	1716	14		0	2p	11
	28	47	1727	11	3d	15		0
	29	2	1742	15		0	2p	12
	29	14	1754	12	3a	2		0
	29	16	1756	2	1a	26		0
	29	42	1782	26		0	2p	8
	29	50	1790	8	3d	63		0
	30	53	1853	63	3a	17		0
	31	10	1870	17	1a	44		0
	31	54	1914	44		0	2p	32
	32	26	1946	32	1d	21		0
	32	47	1967	21	1a	6		0
	32	53	1973	6	1a	47		0
	33	40	2020	47	3a	5		0
	33	45	2025	5	1a	70		0
	34	55	2095	70		0	2p	11
	35	6	2106	11	1a	16		0
	35	22	2122	16		0	2p	18
	35	40	2140	18	3a	29		0
	36	9	2169	29		0	2p	11
	36	20	2180	11	1s	15		0
	36	35	2195	15	3a	35		0
	37	10	2230	35		0	2p	118
	39	8	2348	118	3d	25		0
	39	33	2373	25	1a	17		0
	39	50	2390	17		0	2p	9
	39	59	2399	9	1p	36		0
	40	35	2435	36		0	2p	8
	40	43	2443	8	1a	33		0
	41	16	2476	33	1s	34		0
	41	50	2510	34	1a	8		0
	41	58	2518	8		0	2p	42
	42	40	2560	42	1a	32		0
RS 5	43	12	2592	32	1s	27	2s	27
	43	39	2619	27	1p	9		0

RS	5	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
43	48	2628	9			6	2p	6	
43	54	2634	6	3d		82		0	
45	16	2716	82	1p		14		0	
45	30	2730	14			0	2p	4	
45	34	2734	4	3d		23		0	
45	57	2757	23			0	2p	13	
46	10	2770	13	1a		6		0	
46	16	2776	6			0	2p	4	
46	20	2780	4	1a		21		0	
46	41	2801	21			0	2p	13	
46	54	2814	13	3a		11		0	
47	5	2825	11	1a		16		0	
47	21	2841	16	1ar		32	2p	32	
47	53	2873	32	3a		39		0	
48	32	2912	39			0	2r	6	
48	38	2918	6	1p		6		0	
48	44	2924	6			0	2r	11	
48	55	2935	11	1a		25		0	
49	20	2960	25			0	2p	16	
49	36	2976	16	3a		13		0	
49	49	2989	13	1a		24		0	
50	13	3013	24			0	2p	23	
50	36	3036	23	3d		2		0	
50	38	3038	2			0		0	

RS 1	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER DURATION	STUDENT DURATION	DURATION	
	0	0	0	0	1d	30	2r	30
	0	30	30	30	1d	86		0
	1	56	116	86		0	2r	12
	2	8	128	12	1ar	47	2r	47
	2	55	175	47	1d	3		0
	2	58	178	3	1p	1		0
	2	59	179	1		0	2p	12
	3	11	191	12	1a	2		0
	3	13	193	2		0	2p	18
	3	31	211	18	1a	3		0
	3	34	214	3		0	2p	17
	3	51	231	17	3a	2		0
	3	53	233	2		0	2p	5
	3	58	238	5	3a	6		0
	4	4	244	6		0	2r	13
	4	17	257	13	1a	10		0
	4	27	267	10	1ar	35	2p	35
	5	2	302	35	1d	41	2s	41
	5	43	343	41	1a	6		0
	5	49	349	6		0	2r	56
	6	45	405	56	1ar	85	2r	85
	8	10	490	85	1a	5		0
	8	15	495	5		0	2r	45
	9	0	540	45	1a	12		0
	9	12	552	12	1p	11		0
	9	23	563	11		0	2p	30
	9	53	593	30	3a	29		0
	10	22	622	29	1p	8		0
	10	30	630	8		0	2p	28
	10	58	658	28	3a	6		0
	11	4	664	6	1a	8		0
RS 2	11	12	672	8	1d	76		0
	12	28	748	76	1a	8		0
	12	36	756	8	1p	2		0
	12	38	758	2		0	2p	9
	12	47	767	9	1pr	69	2p	69
	13	56	836	69	1p	26		0
	14	22	862	26	1s	5		0
	14	27	867	5	1p	5		0
	14	32	872	5		0	2p	6
	14	38	878	6	1a	9		0
	14	47	887	9		0	2p	7
	14	54	894	7	3d	25		0

RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
15	19	919	25		0	2p	15	
15	34	934	15	1a	6		0	
15	40	940	6		0	2r	3	
15	43	943	3	1a	11		0	
15	54	954	11		0	2p	2	
15	56	956	2	3a	3		0	
15	59	959	3		0	2p	2	
16	1	961	2	1a	5		0	
16	6	966	5		0	2p	28	
16	34	994	28	1p	24		0	
16	58	1018	24		0	2p	7	
17	5	1025	7	1p	16		0	
17	21	1041	16		0	2p	220	
21	1	1261	220	3a	6		0	
21	7	1267	6	1a	16		0	
21	23	1283	16	1p	20		0	
21	43	1303	20	1a	9		0	
21	52	1312	9	1ar	30	2p	30	
22	22	1342	30	1p	13		0	
22	35	1355	13	1a	7		0	
22	42	1362	7		0	2p	45	
23	27	1407	45	1a	43		0	
24	10	1450	43	1ar	19	2r	19	
24	29	1469	19	1a	16		0	
24	45	1485	16	1p	9		0	
24	54	1494	9		0	2p	4	
24	58	1498	4	3a	5		0	
25	3	1503	5		0	2p	4	
25	7	1507	4	3d	6		0	
25	13	1513	6		0	2p	4	
25	17	1517	4	3d	4		0	
25	21	1521	4		0	2p	3	
25	24	1524	3	1a	4		0	
25	28	1528	4		0	2p	2	
25	30	1530	2	1a	2		0	
25	32	1532	2		0	2p	2	
25	34	1534	2	1a	4		0	
25	38	1538	4	3d	18		0	
25	56	1556	18		0	2p	4	
26	0	1560	4	1a	13		0	
26	13	1573	13		0	2p	2	
26	15	1575	2	1s	20		0	
26	35	1595	20	1d	17		0	
26	52	1612	17		0	2p	2	

	RS 2	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
	26	54	1614	2	3a	5		0	
	26	59	1619	5		0	2r	13	
	27	12	1632	13	3a	7		0	
	27	19	1639	7	1d	25		0	
	27	44	1664	25	1a	9		0	
	27	53	1673	9		0	2p	3	
	27	56	1676	3	3d	33		0	
	28	29	1709	33		0	2p	28	
	28	57	1737	28	1a	33		0	
	29	30	1770	33	1a	6		0	
	29	36	1776	6		0	2p	116	
	31	32	1892	116	1ar	28	2p	28	
	32	0	1920	28	1ar	76	2p	76	
	33	16	1996	76	3d	6		0	
RS 3	33	22	2002	6	1a	12		0	
	33	34	2014	12	1ar	25	2r	25	
	33	59	2039	25	1a	61		0	
	35	0	2100	61	1s	39	2s	39	
	35	39	2139	39	1a	13		0	
	35	52	2152	13	1p	17		0	
	36	9	2169	17		0	2p	10	
	36	19	2179	10	3d	24		0	
	36	43	2203	24		0	2p	7	
	36	50	2210	7	3d	9		0	
	36	59	2219	9		0	2p	8	
	37	7	2227	8	1p	8		0	
	37	15	2235	8		0	2p	4	
	37	19	2239	4	1a	3		0	
	37	22	2242	3		0	2p	2	
	37	24	2244	2	1a	25		0	
	37	49	2269	25		0	2p	2	
	37	51	2271	2	3d	7		0	
	37	58	2278	7		0	2p	5	
	38	3	2283	5	3a	9		0	
	38	12	2292	9		0	2p	30	
	38	42	2322	30	1a	7		0	
	38	49	2329	7		0	2p	15	
	39	4	2344	15	1a	11		0	
	39	15	2355	11		0	2p	14	
	39	29	2369	14	1a	23		0	
	39	52	2392	23	3a	11		0	
	40	3	2403	11	1p	21		0	
	40	24	2424	21		0	2p	21	
	40	45	2445	21	3d	61		0	

RS 3	MINUTES	SECONDS	T.SECONDS	INTERVAL	TEACHER	DURATION	STUDENT	DURATION
41	46	2506	61	1ar	42	2p	42	
42	28	2548	42	1p	22		0	
42	50	2570	22	1a	29		0	
43	19	2599	29	1p	6		0	
43	25	2605	6		0	2p	5	
43	30	2610	5	3d	34		0	
44	4	2644	34	1a	13		0	
44	17	2657	13		0	2p	78	
45	35	2735	78	1d	18		0	
45	53	2753	18	1a	20		0	
46	13	2773	20		0	2p	7	
46	20	2780	7	1a	9		0	
46	29	2789	9		0	2p	161	
49	10	2950	161	3a	10		0	
49	20	2960	10		1824		1702	

APPENDIX C

Subject Composite Rates per Minute

A-Beginning TOTAL SECONDS SEGMENT TIMES % OF TOTAL REH.

SEGMENT 1	834	834	29.0%
SEGMENT 2	1439	605	21.0%
SEGMENT 3	2134	695	24.1%
SEGMENT 4	2880	746	25.9%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	369	18	2.93
SEGMENT 2	370	26	4.22
SEGMENT 3	602	16	1.59
SEGMENT 4	598	16	1.61

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	651	16	1.47
SEGMENT 2	286	21	4.41
SEGMENT 3	425	11	1.55
SEGMENT 4	351	12	2.05

A-Advanced TOTAL SECONDS SEGMENT TIMES % OF TOTAL REH.

SEGMENT 1	900	900	30.6%
SEGMENT 2	1859	959	32.7%
SEGMENT 3	2034	175	6.0%
SEGMENT 4	2802	768	26.1%
SEGMENT 5	2937	135	4.6%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	446	28	3.77
SEGMENT 2	493	40	4.87
SEGMENT 3	76	5	3.95
SEGMENT 4	466	28	3.61
SEGMENT 5	17	3	10.59

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	731	24	1.97
SEGMENT 2	502	35	4.18
SEGMENT 3	133	4	1.80
SEGMENT 4	385	25	3.90
SEGMENT 5	80	1	0.75

B-Beginning TOTAL SECONDS SEGMENT TIMES % OF TOTAL REH.

SEGMENT 1	1001	1001	34.5%
SEGMENT 2	1959	958	33.0%
SEGMENT 3	2306	347	12.0%
SEGMENT 4	2899	593	20.5%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	717	37	3.10
SEGMENT 2	846	22	1.56
SEGMENT 3	273	9	1.98
SEGMENT 4	438	19	2.60

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	717	27	2.26
SEGMENT 2	229	19	4.98
SEGMENT 3	97	5	3.09
SEGMENT 4	294	17	3.47

B-Advanced TOTAL SECONDS SEGMENT TIMES % OF TOTAL REH.

SEGMENT 1	1295	1295	43.40
SEGMENT 2	2510	1215	40.70
SEGMENT 3	2984	474	15.90

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	1180	48	2.44
SEGMENT 2	1018	30	1.77
SEGMENT 3	178	14	4.72

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	1116	34	1.83
SEGMENT 2	829	17	1.23
SEGMENT 3	167	10	3.59

C-Beginning TOTAL SECONDS SEGMENT TIMES % OF TOTAL REH.

SEGMENT 1	1584	1584	49.7%
SEGMENT 2	1864	280	8.8%
SEGMENT 3	2690	826	25.9%
SEGMENT 4	3188	498	15.6%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	1078	43	2.39
SEGMENT 2	159	11	4.15
SEGMENT 3	598	34	3.41
SEGMENT 4	327	21	3.85

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	1276	38	1.79
SEGMENT 2	154	12	4.68
SEGMENT 3	402	29	4.33
SEGMENT 4	220	16	4.36

C-Advanced TOTAL SECONDS SEGMENT TIMES % OF TOTAL REH.

SEGMENT 1	916	916	31.8%
SEGMENT 2	1540	624	21.7%
SEGMENT 3	2123	583	20.3%
SEGMENT 4	2878	755	26.2%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	517	29	3.37
SEGMENT 2	331	23	4.17
SEGMENT 3	364	19	3.13
SEGMENT 4	501	25	2.99

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	773	29	2.25
SEGMENT 2	379	19	3.01
SEGMENT 3	321	20	3.74
SEGMENT 4	377	17	2.71

D-Beginning	TOTAL SECONDS	SEGMENT TIMES	% OF TOTAL REH.
SEGMENT 1	602	602	21.6%
SEGMENT 2	1658	1056	37.8%
SEGMENT 3	2430	772	27.7%
SEGMENT 4	2791	361	12.9%
SEGMENT 5	2988	197	6.6%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	289	37	7.68
SEGMENT 2	638	34	3.20
SEGMENT 3	482	26	3.24
SEGMENT 4	250	5	1.20
SEGMENT 5	130	4	1.85

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	370	30	4.86
SEGMENT 2	592	27	2.74
SEGMENT 3	545	23	2.53
SEGMENT 4	165	4	1.45
SEGMENT 5	125	3	1.44

D-Advanced	TOTAL SECONDS	SEGMENT TIMES	% OF TOTAL REH.
SEGMENT 1	296	296	10.2%
SEGMENT 2	876	580	20.0%
SEGMENT 3	1742	866	29.9%
SEGMENT 4	2895	1153	39.8%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	202	12	3.56
SEGMENT 2	298	24	4.83
SEGMENT 3	388	37	5.72
SEGMENT 4	639	44	4.13

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	196	8	2.45
SEGMENT 2	270	23	5.11
SEGMENT 3	497	35	4.23
SEGMENT 4	580	38	3.93

E-Beginning	TOTAL SECONDS	SEGMENT TIMES	% OF TOTAL REH.
SEGMENT 1	430	430	14.2%
SEGMENT 2	989	559	18.4%
SEGMENT 3	1376	387	12.7%
SEGMENT 4	2560	1184	39.0%
SEGMENT 5	3038	478	15.7%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	261	18	4.14
SEGMENT 2	408	15	2.21
SEGMENT 3	293	13	2.66
SEGMENT 4	868	43	2.97
SEGMENT 5	350	16	2.74

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	329	16	2.92
SEGMENT 2	316	7	1.33
SEGMENT 3	168	8	2.86
SEGMENT 4	347	20	3.46
SEGMENT 5	155	11	4.26

E-Advanced	TOTAL SECONDS	SEGMENT TIMES	% OF TOTAL REH.
SEGMENT 1	664	664	22.4%
SEGMENT 2	1996	1332	45.0%
SEGMENT 3	2960	964	32.6%

	TEACHER SECONDS	TEACHER BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	436	20	2.75
SEGMENT 2	799	45	3.38
SEGMENT 3	589	29	2.95

	STUDENT SECONDS	STUDENT BEH/ACTIVITY	RATE PER MINUTE
SEGMENT 1	474	15	1.90
SEGMENT 2	753	29	2.31
SEGMENT 3	475	18	2.27

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