An Investigation of the Effects of Teacher Personality on Teacher Behaviors in the Instrumental Music Classroom: A Path Analysis. (2004)

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ABSTRACT

The present study examined the effects among instrumental music educators' personality types (temperaments), and the behaviors indicative of teaching effectiveness. The teaching behaviors that enhance student learning are teaching immediacy, teacher modeling, teacher feedback, and teacher pace.

The researcher selected 15 high school instrumental music educators (the first fifteen to agree to participate) to participate in this study. Each subject was observed and videotape recorded teaching a 30 min instrumental music lesson within his/her regular instrumental music class.

Upon review of the videotapes, the researcher examined the videotapes for the presence of Rehearsal Frames during the rehearsals. The Rehearsal Frames were extracted from the videotapes for analysis. The researcher administered the Myers-Briggs Type Indicator® and the Teacher Background Survey to each subject. Following the treatment, the videotapes were coded using SCRIBE for the presence of behaviors indicative of teaching effectiveness. Those behaviors were (a) teacher performance, (b) teacher verbalizations (information statements, questions, directives, approvals, disapprovals and off-task statements), (c) teacher performance approximations (sing, chant, clap and dance), (d) eye contact, (e) proximity, (f) alteration of voice, (g) gestures, and (h) facial expressions.

The data analysis revealed that the proposed path models "fit" the data appropriately ($p > .05$). Chi-Square tests of the "fit" of the data revealed effects of Teacher Personality Type on the frequency of Teacher Behaviors (X^2 [26, N = 78] = 29.856, p = .274) and rate of Teacher Behaviors (X^2 [27, N = 78] = 36.036, p = .115). Chi-Square tests of "fit" of the data revealed effects of Teacher Temperament on the frequency of Teacher Behaviors (X^2 [6, N = 36] = 10.946, p = .09), rate of Teacher Behaviors (X^2 [4, N = 36] = 50.96, p = .278), and mean duration of Teacher Behaviors (X^2 [9, N = 36] = 5.553, p = .784). Chi-Square tests of the "fit" of the data revealed effects of Teacher Background on the rate of Teacher Behaviors (X^2 [3, N = 21] = 4.475, p = .215) and the mean duration of Teacher Behaviors (X^2 [7, N = 21] = 8.329, p = .304). Chi-Square tests of the "fit" of the data revealed effects of Teacher Personality (X^2 [26, N = 45] = 36.664, p = .08), Teacher Temperament (X^2 [3, N = 15] = 1.344, p = .719), rate of Teacher Behaviors (X^2 [2, N = 15] = 1.78, p = .411), and mean duration of Teacher Behaviors (X^2 [2, N = 15] = 3.389, p = .184) on the use of Rehearsal Frames. Therefore, the researcher concluded that Teacher Personality (temperament) did have an effect on the Teacher Behaviors (indicative of enhancing student learning) found in the high school instrumental music classroom ($p > .05$).

INTRODUCTION

Research on effective music teaching has been conducted through a number of studies, and is divided into many categories. Two primary categories are teaching behaviors or characteristics (e.g., Flores, 1995; Madsen, Standley, & Cassidy, 1989; Sang, 1987; Yarbrough, Price, & Hendel, 1994), and teacher personality

(e.g., Horton & Oakland, 1997; Keirsey & Bates, 1978; Myers, 1980; Taebel & Coker, 1980). Many studies have identified variables that contribute to effective music teaching, including the use of sequential patterns of instruction (e.g., Arnold, 1995; Hendel, 1995; Speer, 1994; Yarbrough & Hendel, 1993; Yarbrough, Price, & Hendel, 1994), teacher reinforcement and feedback (e.g., Duke & Henninger, 1998, 2002; Duke & Madsen, 1991; Yarbrough & Hendel, 1993), rehearsal frames (Duke, 1994; Duke, 1999/2000), teacher immediacy (intensity) (e.g., Byo, 1989; Cassidy, 1989, 1993; Cofer, 1998; Frymier, 1994; Hamman, Baker, McAllister, & Bauer, 2000; Hamman, Lineburgh, & Paul, 1998; Hendel, 1995; Madsen, 1990; Madsen, Standley, & Cassidy, 1989; Yarbrough, 1975), teacher modeling (e.g., Benson, 1989; Dickey, 1991, 1992; Sang, 1987), teacher pace (e.g., Davis, 1998; Duke, Prickett, & Jellison, 1998; Yarbrough & Madsen, 1998), and teacher knowledge of the subject matter (e.g., Berliner, 1986; Porter & Brophy, 1988). An effective teacher knows how to objectively analyze his or her teaching behaviors also (e.g., Rosenthal, 1985; Taebel, 1990; Wolfe & Jellison, 1990), and can specify competencies of good instruction *a priori* and consequently demonstrate those competencies (e.g., Yarbrough, Price, & Bowers, 1991).

Research on effective teaching has focused on adapting teaching styles to fit student interest and needs (e.g., Erbes, 1983; Hanson, Silver, & Strong, 1991; Porter & Brophy, 1988; Taebel & Coker, 1980; Whitener, 1983), or to fit particular instructional settings (e.g., Erbes, 1983; Hendel, 1995; Moore, 1976). Effective teachers also vary in teacher presentation methods or styles (e.g., Price, 1983; Taebel & Coker, 1980). The researchers found that the effective teacher displays high teacher effect and is an excellent classroom manager (Madsen, Standley, and Cassidy, 1989).

Personality

The personality type of the teacher is associated with teaching effectiveness and style. The two ways a teacher may take in information are through perceiving (sensing or intuition) and judging (thinking or feeling). Teachers may prefer to use this process internally (introversion) or externally (extraversion). The combination of these processes constitutes a teacher's personality type (Jung, 1971).

Research has focused on student preference for teaching style (method of instruction; such as lecture, or guided practice) and teacher personality (e.g., Guerin et al., 1994; Lynch & Sellars, 1996), and on relationships among temperament, teaching style, and learning styles (e.g., Goodstein, 1987; Grindler & Stratton, 1990; Horton & Oakland, 1997; Van, 1992; Winner, 1990). Personality characteristics (e.g., Bergee, 1992; Kourilsky, Esfandiari, & Wittrock, 1996; Lewis & Schmidt, 1991; Sears, Kennedy, & Kaye, 1997; Wubbenhorst, 1991, 1994) and personal descriptors, which attempt to define the effective educator (e.g., Jones, 1989; Murray, Rushton, & Paunonen, 1990; Perry, 1985; Phillips et. al., 1985), also have been identified.

Since research on temperament indicates that an educator will teach to their strength (preferred style), researchers have investigated the temperament type of teachers presently in the field of education. The profile for a music educator was determined to be I/ENFP/J (Wubbenhorst, 1991, 1994). While most subjects in Wubbenhorst's studies were ENF, only the NF temperament was constant throughout all studies. This finding supports Myers' (1980) assertion that the NF temperament is most indicative of career choice in the areas of music and teaching. This meant that the preferred music educator type is the Apollian temperament (NF) or the "pedagogue" mentioned in Keirsey and Bates (1978).

Path Analysis has been used to determine the direct effect of one variable on another. Research has shown that the effects of teacher personality and teacher effectiveness are mediated (50%, $p < .05$) by classroom teaching behaviors (Erdle, Murray, & Rushton, 1985). In other words, Teacher personality has a direct effect

upon classroom teaching behaviors, and teacher classroom behaviors have a direct effect on teacher effectiveness.

Teacher Immediacy

Effective teacher immediacy, also referred to as intensity, is defined as "the sustained control of the student/teacher interaction evidenced by efficient, accurate presentation of subject matter with enthusiastic affect and pacing" (Madsen, 1990, p. 38). Teacher immediacy also is identified as nonverbal teacher behaviors which enhance student achievement. Research suggests that effective music teachers demonstrate high levels of teaching immediacy or intensity (magnitude), use simple, concise, and sequential patterns of instruction, and change pace as well as strategies of instruction as appropriate (Hendel, 1995). Effective music teachers also demonstrate high instances of modeling (modeling generally has been defined as one who demonstrates to be imitated or copied). Moreover, numerous studies identify teacher immediacy (intensity) as a behavior which can be learned and observed, and consequently quantified by persons with differing levels of teaching experience in music (Madsen, Standley, & Cassidy, 1989).

Sequential Patterns of Instruction

Sequential patterns of instruction also have been found to enhance student achievement in music classrooms (Jellison & Kostka, 1987; Price, 1983). Sequential patterns of instruction are teaching episodes and are present in all music classrooms (Yarbrough and Price, 1981). These teaching episodes begin with teacher presentation of task (teacher modeling and instruction). Teacher presentation is followed by student response (teacher performance or answers/questions). The last component of the sequential pattern (episode) is teacher reinforcement (positive or negative). Complete sequential patterns of instruction contain all components of the teaching episode (teacher presentation, student response, and teacher reinforcement). Yarbrough and Hendel (1993) found that students prefer sequential patterns beginning with musical information and ending with approvals more often than sequential patterns of instruction of any other type. Madsen, Standley, and Cassidy (1989) reported that teachers using high instances of teaching intensity and sequential patterns of instruction are viewed as effective teachers (e.g., exhibiting high teacher effect) and as excellent classroom managers.

Rehearsal Frames

Rehearsal frames are more appropriate for use in observing instrumental music ensembles. Duke (1999/2000) found that within all rehearsals, lessons, or classes, time of concentrated effort and attention exerted upon skills in music making. The researcher claimed that this concentrated part of the rehearsal was the focus of rehearsal frames. These extended periods were viewed as "mini lessons" that sought to accomplish one or more music making goals. The use of "performance goals as the organizing principle" was key to the framework. The beginning of a rehearsal frame was acknowledged when the teacher identified the performance goal in need of approximation. The identification of the performance goal could be implicit or explicit and also could occur nonverbally (through modeling). A series of attempts trying to change the goal was attempted, following identification of the target. The researcher noted that in rehearsal frames, the goal/target was the "organizing principle," instead of teacher behaviors and strategies used by the instructor effecting student change of behavior. The researcher concluded that because rehearsal frames were specifically associated with instructional activities (including teacher behaviors), the connections between teacher behaviors, student behaviors directed by the teacher, and student learning were easier to observe.

Purpose

The purpose of this study was to examine the effects among instrumental music educators' personality types (temperaments), and the behaviors indicative of teaching effectiveness. This study attempted to identify the direct effect of teacher personality on the teacher behaviors in the instrumental music classroom. The teaching behaviors that enhanced student learning, when correctly used, were teacher intensity (immediacy), teacher modeling, teacher feedback, and teacher pace. Of primary interest in this study was the music educators' use of rehearsal frames and teaching immediacy (including teacher pace). Effects among teacher personality, teaching behaviors and teaching background (teacher education [bachelor, masters, or doctorate] and years of service) also were investigated.

Questions emerged from the exploration of the various types of teaching effectiveness research.

1. What is the personality type (E/I, S/N, T/F, J/P) and temperament (NF, SJ, SP, or NT) of instrumental music educators?
2. What are the effects of teacher personality and teacher temperament on frequency, rate, and mean duration of teacher behaviors?
3. What are the effects of teacher background (training and years of teaching experience) on frequency, rate, and mean duration of teacher behaviors (teacher pace, teacher intensity, teacher feedback, and teacher modeling)?
4. What are the effects of teacher personality, teacher temperament, teacher background, frequency of teacher behavior, rate of teacher behavior, and mean duration of teacher behavior on the use of rehearsal frames?

METHOD

Subjects were fifteen high school instrumental music educators. They were selected on the basis of their willingness to participate and were from Louisiana (n = 7), Arkansas (n = 4), Texas (n = 3) and West Virginia (n = 1). All participants are associated with the Music Educators National Conference (MENC). After stating their willingness to participate, the researcher scheduled an optimum time to observe each music educator rehearsing his/her instrumental music class. The researcher made arrangements to personally administer the MBTI® and the Teacher Background Survey to each subject. Teacher training (bachelor, masters, or doctorate degrees) and teaching experience were collected using the Teacher Background Survey.

A 30-min instrumental music classroom observation with high school band students was arranged for each subject. Each classroom observation was videotaped. The video camera was mounted on a tripod that was positioned prior to the beginning of the rehearsal and placed in the least restrictive place within the classroom where the teacher could be viewed clearly. Only the rehearsal of music was analyzed for this investigation; sight-reading, and warm-up activities were not examined.

Following observation, the researcher reviewed the videotapes removing all classroom distractions, warm-up and sight-reading activities, and any other activities not pertinent to the rehearsal (i.e., announcements, taking roll, or taking up money).

All rehearsals were analyzed for the presence of rehearsal frames that were subsequently counted and timed. Each rehearsal frame was then reviewed in order to record the teacher behaviors that were present using a computerized observation program, SCRIBE: Simple Computer Recording Interface for Behavioral Evaluation (Duke & Farra, 1997). The operational definitions of categories of behavior were developed from

previous research that examined student-teacher interactions and rehearsal procedures in music performance instruction (Sibenaler, 1992).

The computer program, *Systematic Observation and Analysis of Teacher Student Interactions in Music* (SCRIBE), was used to analyze each rehearsal frame (Colprit, 2000). SCRIBE allowed the researcher to create customized observations focusing on specific teacher/student behaviors.

The behaviors that were analyzed with SCRIBE were:

1. *Teacher performance* (TP). Defined as any performance on an instrument.
2. *Teacher verbalizations*. Categorized by

A. *Information Statements* (I). Statements made by the teacher about the subject matter, but does not direct the students to specific performance actions
B. *Questions* (Q). Asked by the teacher in expectation of student response
C. *Directives* (D). Statements directing students to do something
D. *Approvals* (A). Specific or general positive comments about student performance
E. *Disapprovals* (DA). Specific or general negative comments about student performance
F. *Off-task Statements* (OT). Statements not pertaining to the task

3. *Teacher performance approximations* (TPA). Defined as any performance not on an instrument.

A. Sing
B. Chant
C. Clap
D. Dance

4. *Eye contact* (E). Described as any use of eye contact to direct students toward the achievement of the specific target (performance goal).
5. *Proximity* (PR). Defined as any use of nearness or lack thereof to students to direct students toward the achievement of the specific target.
6. *Alteration of voice* (AV). Described as any use of voice volume or inflection to direct students toward the achievement of the specific target.
7. *Gestures* (G). Defined as any use of nonverbal conducting gestures to direct students toward the achievement of the specific target.
8. *Facial expressions* (F). Described as any nonverbal communication emoted to direct students toward the achievement of the specific target.

Modeling was defined by behaviors 1 and 3. Teacher feedback was determined from behavior 2. Teacher immediacy was identified as the duration of teaching behaviors 4 - 8.

Within each videotaped classroom observation, the researcher identified the rehearsal frames that occurred during the observation. The researcher used all rehearsal frames present within each videotaped classroom observation as the unit of analysis. Rehearsal frames began when the instrumental music educator identified parts of student performance needing improvement, and ended when the specific goal was completed (Colprit, 2000).

The subjects' personality types were used to determine their preferred learning/teaching styles and temperament (Keirsey and Bates, 1978): *Dionysian* is a combination of Sensing and Perceiving (SP); *Epimethean* is a combination of Sensing and Judging (SJ); *Promethean* is a combination of Intuition and Thinking (NT); and *Apollonian* is a combination of Intuition and Feeling (NF). Each teacher's inventory was

graded by the Center for Applications for Psychological Type (CAPT), in Gainesville, Florida, and the results (including a type table) of the total sample were sent to the researcher.

Data consisted of scores from the MBTI® and the behaviors observed through SCRIBE within the rehearsal frames. Multiple regression was used to determine which variables were the best predictors of Teaching Effectiveness and the strength, significance, and direction of each relationship. Multiple regression was used to calculate the path coefficients needed in path analysis also. In the Structural Equation Model (path analysis), teacher personality was the primary independent variable. Teacher background was the secondary independent variable. Teacher immediacy, teacher feedback, teacher modeling, and teacher pace were dependent variables.

RESULTS

Fifteen high school instrumental music educators were used as subjects. Of the fifteen participants in this study, seven had Bachelor's degrees, seven had Master's degrees, and one was a classified a student teacher. The mean total of teacher experience was 13.77 years, while the mean at the present position was 6.17 years. Thirteen of the participants were male, while the remaining two were female. Each subject was videotaped during a regular instrumental music class. The researcher videotaped at least 13 min per subject. Afterwards, the videotapes were analyzed for the use of rehearsal frames. Each rehearsal frame was analyzed for the presence of teacher behaviors that are indicative of teaching effectiveness (teacher pace, teacher intensity, teacher feedback, and teacher modeling). A total of 115 rehearsal frames were included in the final analysis.

Teacher Personality Types

Eight personality types were found among the fifteen participants in this study. Those personality types were:

1. ISTJ (5): Introverted Sensing with Thinking.
2. ENTJ (2): Extraverted Thinking with Intuition.
3. ESTP: Extraverted Sensing with Thinking.
4. ESTJ (3): Extraverted Thinking with Sensing.
5. ENTP: Extraverted Intuition with Thinking.
6. INTJ: Introverted Intuition with Thinking.
7. INFJ: Introverted Intuition with Feeling.
8. ESFP: Extraverted Sensing with Feeling.

A correlation (r = -.661, p = .007) was found between the Intuitive (N) and Sensing (S) types. Likewise, another correlation (r = -.541, p = .037) was found between Judging (J) and Perceptive (P) types. A correlation (r = .609, p = .016) was found between Thinking (T) and Judging (J) types. An additional correlation (r = .587, p = .021) was found between the Feeling (F) and Perceptive (P) types.

Teacher Temperament

There were four temperaments identified among the participants in this study; (a) NF (n = 1), (b) SP (n = 2), (c) NT (n = 4), and (d) SJ (n = 8). A correlation (r = -.645, p = .009) was found between the SJ and NT temperaments.

Teacher Behaviors

Teacher Pace was determined by the mean rate of behaviors over the course of the rehearsal for all participants. The mean rate of teacher behaviors for all subjects was 7.82/min, with a minimum rate of 4.72/minute and a maximum rate of 10.82/min.

Teacher Intensity was determined by the nonverbal teacher behaviors (eye contact, alteration of voice, gestures, facial expression, and proximity) observed during the instrumental music rehearsal. Results indicated the mean frequency (37.73), mean rate (1.53/min) and mean duration (2.71 s) of teaching intensity behaviors observed. Results for each nonverbal teacher behavior were identified as well:

1. Eye Contact: Mean Frequency (5.67), Mean Rate (.23/min), and Mean Duration (1.58 s).
2. Proximity: Mean Frequency (6.33), Mean Rate (.22/min), and Mean Duration (1.81 s).
3. Alteration of Voice: Mean Frequency (.33), Mean Rate (.0067/min), and Mean Duration (.42 s).
4. Gestures: Mean Frequency (13.6), Mean Rate (.54/min), and Mean Duration (2.95 s).
5. Facial Expression: Mean Frequency (13.67), Mean Rate (.53/min), and Mean Duration (1.76 s).

Teacher Feedback was determined by the teacher approvals and disapprovals observed during the instrumental music rehearsal. Results indicated the mean frequency (59.33), mean rate (2.19/min) and mean duration (3.52 s) of teacher feedback behaviors observed. Further results were:

1. Teacher Approvals: Mean Frequency (10.73), Mean Rate (.41/min) and Mean Duration (1.61 s).
2. Teacher Disapprovals: Mean Frequency (41.2), Mean Rate (1.57/min) and Mean Duration (3.79 s).

Teacher modeling was determined by teacher performance and teacher performance approximations observed during the instrumental music rehearsal. Results indicated the mean frequency (29.27), mean rate (1.09/min) and mean duration (4.83 s) of teacher modeling behaviors observed. Additional findings were:

1. Teacher Performance: Mean Frequency (.13), Mean Rate (.0067/min) and Mean Duration (.93 s).
2. Teacher Performance Approximations: Mean Frequency (29.13), Mean Rate (1.08/min) and Mean Durations (4.81 s).

Teacher Presentation (teacher talk) was determined by the behaviors (a) information statements, (b) directives, (c) questions, and (d) off-task statements. Results indicated the mean frequency (80.4), mean rate (3.02/min) and mean duration (4.97 s). Further findings were:

1. Information Statements: Mean Frequency (15.4), Mean Rate (.55/min) and Mean Duration (6.21 s).
2. Questions: Mean Frequency (12.67), Mean Rate (.47/min) and Mean Duration (4.15).
3. Directives: Mean Frequency (52.33), Mean Rate (1.99/min) and Mean Duration (4.99 s).
4. Off-Task Statements: Mean Frequency (5.33), Mean Rate (.19/min) and Mean Duration (3.2 s).

Teacher Background

Correlations were found between total years of teaching experience and degree attained (r = .536, p = .039), and total years of teaching experience and years at present position (r = .637, p = .011).

Data Analysis

Path analysis revealed "good fit" models for ($p > .05$):

1. The effects of personality type on frequency of teacher behaviors (X^2 [26, N = 78] = 29.856, p = .274),
2. The effects of personality type on rate of teacher behaviors (X^2 [27, N = 78] = 36.036, p = .115),

3. The effects of teacher temperament on frequency of teacher behaviors (X^2 [6, N = 36] = 10.946, p = .09),
4. The effects of teacher temperament on rate of teacher behaviors (X^2 [4, N = 36] = 5.096, p = .278),
5. The effects of teacher temperament on mean duration of teacher behaviors (X^2 [9, N = 36] = 5.553, p = .784),
6. The effects of teacher background on rate of teacher behaviors (X^2 [3, N = 21] = 4.475, p = .215),
7. The effects of teacher background on mean duration of teacher behaviors (X^2 [7, N = 21] = 8.329, p = .304),
8. The effects of personality type on the use of rehearsal frames (X^2 [26, N = 45] = 36.664, p = .08),
9. The effects of teacher temperament on the use of rehearsal frames (X^2 [3, N = 15] = 1.344, p = .719),
10. The effects of rate of teacher behaviors on the use of rehearsal frames (X^2 [2, N = 15] = 1.78, p = .411), and
11. The effects of mean durations of teacher behaviors on the use of rehearsal frames (X^2 [2, N = 15] = 3.389, p = .184).

Moreover, teacher personality type accounted for the variance in (a) frequency of teacher behaviors (39% of Intensity, 54% of Feedback, 44% of Modeling, and 71% of Pace), (b) rate of teacher behaviors (50% of Intensity, 58% of Feedback, 60% of Modeling, and 60% of Pace) and (c) use of rehearsal frames (58%). Teacher temperament accounted for the variance in (a) frequency of teacher behaviors (13% of Intensity, 3% of Feedback, 10% of Modeling, and 36% of Pace), (b) rate of teacher behaviors (20% of Intensity, 23% of Feedback, 18% of Modeling, and 32% of Pace), (c) mean durations of teacher behaviors (31% of Intensity, 2% of Feedback, 19% of Modeling, and 28% of Pace), and (d) use of rehearsal frames (13%). Teacher background accounted for the variance in (a) rate of teacher behaviors (19% of Intensity, 1% of Feedback, 7% of Modeling, and 21% of Pace), and (b) mean duration of teacher behaviors (14% of Intensity, 9% of Feedback, 7% of Modeling, and 36% of Pace). The rate of teacher behaviors accounted for 32% of the variance in use of rehearsal frames. Likewise, mean duration of teacher behaviors accounted for 56% of the variance in use of rehearsal frames.

DISCUSSION

Teacher personality type

Teacher personality type (or a teacher's preference for personality variables) accounted for a large part of the variance in teacher behaviors in both the frequency model (39% of Intensity, 54% of Feedback, 44% of Modeling, and 71% of Pace) and the rate model (50% of Intensity, 58% of Feedback, 60% of Modeling, and 60% of Pace). Two ways for a teacher to take in information are through perceiving (sensing and intuition) and through judging (thinking and feeling). Teachers may prefer to use this process internally (introversion) or externally (extroversion). Clearly, a teacher's preference for taking in information (judging or perceiving) and their environmental orientation (internal or external) are influential in the frequency and rates of behaviors used in the instrumental music classroom. When attempting to enhance student achievement, there are a plethora of teacher behaviors at the teacher's disposal. Generally, there is not one answer. In other words, teacher personality preference has an influence on the frequency and rates of behaviors that teachers choose to use in the instrumental music classroom. The model of effects of personality type on mean duration of teacher behaviors did not fit the data. The mean duration of a teacher behavior was defined as the average time of a given behavior over the course of all rehearsal frames. Consistent averages in time could not be expected in any

instrumental music rehearsal frame due to the highly "fluid" nature of such situations. Teacher behaviors are dependent upon student performance. In other words, the duration of behavior will depend upon the type of behavior needed (i.e., correction, modeling, nonverbal). Since mean duration was determined across all occasions of rehearsal frames a number of different behaviors at very different amounts of times were present for all participants. Mean duration is thus a situational variable. While teacher personality type apparently affects the frequency and rates of behaviors, it apparently does not affect the mean duration of such behaviors found in the instrumental music classroom. In other words, although a teacher may prefer using a behavior in a given situation, the amount of time needed for that given behavior will not depend on preference but on student needs in the rehearsal situation.

Teacher temperament

Teacher temperament accounted for the variance of teacher behaviors in the frequency (13% of Intensity, 3% of Feedback, 10% of Modeling, and 36% of Pace), rate (20% of Intensity, 23% of Feedback, 18% of Modeling, and 32% of Pace), and mean duration models (31% of Intensity, 2% of Feedback, 19% of Modeling, and 28% of Pace). Teacher temperament, as defined in the present study, is a combination of a teacher's preference for perceiving and judging (the two ways to take in information). In other words, teacher temperament is defined as teacher preference for personality variables of taking in information. Teacher temperament has no relationship with the orientation with which a teacher prefers to use that information (internally or externally). The combination of personality variables (perceiving and judging) was chosen because all personality types of a given temperament (i.e., ENFP, INFP, ENFJ, and INFJ) behave similarly and because teaching and learning styles are derived from this combination. Since teacher temperament clearly has an effect on the frequency, rate, and mean duration of teacher behavior in the instrumental music classroom, teacher orientation environment (internal or external) must be the determining factor in situational variables such as mean duration of teacher behaviors. In other words, a teacher's preference for introversion or extraversion has an effect on the length of time a behavior is used in a given situation. Previous research has encouraged teachers to teach to all learning styles in their classrooms. However, little has been said about the mechanics involved in this process. A teacher must be able to function internally and externally in the instrumental music classroom in order to accommodate all temperaments and personality types. Teachers of music educators spend time reviewing the types of behaviors that should be used in rehearsal situations, and how they can be applied. Perhaps teachers of music educators should also incorporate the amount of time needed to use a given teacher behavior. The amount of time of a teacher behavior affects the number of behaviors used (frequency), the number of behaviors per min (rate), and the average time of behavior over the course of the rehearsal (mean duration).

Teacher background

Teacher background accounted for the variance of teacher behaviors in the rate (19% of Intensity, 1% of Feedback, 7% of Modeling, and 21% of Pace), and the mean duration models (14% of Intensity, 9% of Feedback, 7% of Modeling, and 36% of Pace). Teacher background was defined by two variables (training and years of experience). Teacher training was defined by the highest degree attained, and the variable years of experience was determined by the total number of years that a teacher has taught. The frequency of teacher behaviors does not seem to be affected by the degree attained by a teacher, nor by the number of years teaching but by preference of personality variables. In other words, teacher training and years of experience did not

influence the frequency of teacher behavior used. However, teacher background did have an apparent effect on the rate and mean duration of teacher behaviors. Most prominently, Teacher Intensity and Teacher Pace were affected. Intensity was defined as nonverbal teacher behaviors used to enhance student achievement. Pace was determined by the mean duration of all behaviors. Previous research has indicated that experienced teachers talk less, and have a greater variety of pace in their rehearsals. Teacher background clearly affects a teacher's ability to use nonverbal behavior and to vary the durations of behaviors depending on the situation.

Use of rehearsal frames

Teacher personality type (58%), teacher temperament (13%), rate of teacher behavior (32%), and mean duration of teacher behavior (56%) accounted for variance in use of rehearsal frames. Rehearsal frames were defined as a time of focused work directed toward the task of music creating/performing. Clearly, teacher background and frequency of teacher behavior had no effect on the use of rehearsal frames. Since rehearsal frames are focused rehearsal towards a specific goal, the number of behaviors (frequency) used is less important than the way in which those behaviors are applied. Therefore, a music educator may vary the number of behaviors used to reach specific musical goals depending on the context of the rehearsal frame. Teacher background does not affect the use of rehearsal frames because not all teachers with the same degree have similar years of teaching experience. In other words, teachers with a Bachelor's degree and lots of years of experience differ in their use of rehearsal frames from teachers with a Bachelor's degree and few years of experience. Another factor is that teachers of music educators emphasize the use of rehearsal frames; therefore, years of experience will have less of an effect as more teachers put into practice what they have learned in music teacher education programs.

Teacher personality (temperament) has an effect on the use of rehearsal frames in the instrumental music classroom. However, since no distinction was made of the type of rehearsal frames used, or the type of behavior corrected in this study, further study is warranted. A teacher's preference for taking in information and where he/she prefers to use that information (internally or externally) affects how they prefer to rehearse. In other words, some types prefer work with small groups, and some types prefer to work with large groups. Some types prefer to correct incorrect notes and rhythm before correcting any other type of error, while other types prefer to fix each error as it becomes apparent. Further research on the effect of personality variables (type and temperament) on specific rehearsal frames (individual, small group, large group, or mixed) and type of error corrected is needed.

Rate of teacher behavior was determined by the number of behaviors which occurred per min, and mean duration was determined by the average time of each behavior. In both models (rate and mean duration), teacher modeling was found to have direct effects on the use of rehearsal frames. Teacher intensity and teacher feedback also were found to have direct effects on the use of rehearsal frames as well. Conversely, teacher pace was found to have an inverse effect on the use of rehearsal frames. The results indicate that teacher modeling plays an important role in the use of rehearsal frames. Previous research indicates that teacher modeling enhances student achievement more than any other type of teacher behavior. Therefore, teachers of music educators should continue to encourage future music educators to use modeling as a behavior to enhance student achievement. The present study did not make a distinction between negative and positive modeling. Further investigation into the type of modeling and its use (teacher presentation or teacher feedback) will further enhance our knowledge of teacher modeling and its effects on the use of rehearsal frames and its ability to enhance student achievement.

Teacher intensity was defined as the nonverbal behaviors used by music educators to enhance student achievement/performance. Nonverbal behaviors were used in a number of ways in this study. Nonverbal behaviors were used to correct errors/behaviors (teacher feedback) and to model behaviors (teacher modeling). No distinction was made in this study between types of nonverbal behaviors. Teacher intensity had the second largest direct effects on the use of rehearsal frames. Teacher intensity is used as an alternative to speaking feedback information. This allows the teacher to continue the flow of the rehearsal frame without getting bogged down with unnecessary talking. Teacher intensity also gives the teacher a way to attempt to continue changing pace, even in the midst of a rehearsal frame. A teacher may correct an error with teacher feedback, and then upon the second approximation correct the error with a facial expression or a gesture. This allows the teacher to continue working towards successfully reaching the target, while changing the approach (and further accommodating other learning styles). Teachers of music educators should continue to encourage the use of teacher intensity as a means of correcting errors or behavior, and also as a means of changing pace in the instrumental music classroom.

Teacher feedback (approval or disapproval) is very important in the correction of student behavior. In working towards a proximal target, as music educators do in rehearsal frames, feedback information is key in altering student performance. This guidance is a key ingredient in the success or failure of the student's (or students') ability to reach the specified goal. Teacher feedback was found to affect the use of rehearsal frames in the rate of teacher behavior model more than in the mean duration of teacher behaviors model. Previous research on teacher feedback has revealed a high frequency in the occurrence of behaviors but not necessarily long durations of time. Even the present study reveals that teacher feedback occurs frequently, but mean duration of episode is not comparable to teacher modeling or teacher talk. Teachers of music educators encourage the use of teacher feedback as a way to correct and modify student performance. This is perhaps the greatest tool when using rehearsal frames (taking into consideration negative modeling as a form of teacher feedback).

Teacher pace was found to have inverse effects on the use of rehearsal frames. As previously mentioned, work towards a specific target (goal) will greatly affects a teacher's pace. In normal rehearsal, a music educator may vary the frequency of behaviors used depending upon the classroom situations that arise. Additionally, rate and mean duration of teacher behaviors are dependent on the number of rehearsal frames found in the course of an instrumental music rehearsal. The greater the variety of rehearsal frames (individual, small group, large group, or mixed) and the greater variety of errors in need of correction can adversely affect a teacher's ability to use high or low pace, or to change their pace. Teacher pace is a very important element in the enhancement of student of achievement. Teachers of music educators should continue to stress the importance of changing the pace of rehearsal to match the situation and to enhance student performance.

Path analysis is not intended to find causes but to identify potential variables within a proposed model. The researcher hypothesizes a model based on knowledge of previous research and practice. The saying "theory follows practice" certainly applies in this case. Clearly, teacher personality and temperament are influential in the instrumental music classroom. Researchers have stated the benefits of these behaviors and championed their ability to enhance student learning. Music teacher education programs attempt to develop a novice's ability to use these teacher behaviors, and to use them within rehearsal frames. While other studies have indicated a causal link between teacher personality and the behaviors found in the classroom, this study identifies the effects of that link in the instrumental music classroom. Path analysis is used to present models for future research. Historical research tells researchers about previous practice, and descriptive research speaks

to current practice. Path analysis (causal analysis or model building), thus, is the practice of taking previous and current practices and hypothesizing theory. Previous research indicated the causal link (teacher personality on teacher behaviors). Previous research in music education has provided the practice behind the models proposed in this study. Hence, the models that have been found to fit the data will now be considered theory of previous practice in instrumental music teaching. Future research may focus on specific elements of these models for investigation. Also this knowledge is useful to the college educator who is training interns, using the knowledge of their personality type (temperament) to further develop their use of behaviors that enhance student learning.

The results of this study do not differentiate between negative and positive modeling. The use of negative and positive modeling and the use of modeling as feedback could further develop modeling as a tool teachers can learn and use to enhance student learning in the instrumental classroom.

SUMMARY

Fifteen high school instrumental music educators were selected as subjects for this study. Each subject was videotaped and given the Myers-Briggs Type Indicator, and a Teacher Background Survey. The videotapes were analyzed for the presence of Rehearsal Frames and behaviors that are indicative of effective music teaching (using SCRIBE). Path analysis revealed that the proposed path models "fit" the data appropriately ($p > .05$). The researcher concluded that Teacher Personality (temperament) did have an effect on the Teacher Behaviors (indicative of enhancing student learning) found in the high school instrumental music classroom ($p > .05$).

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