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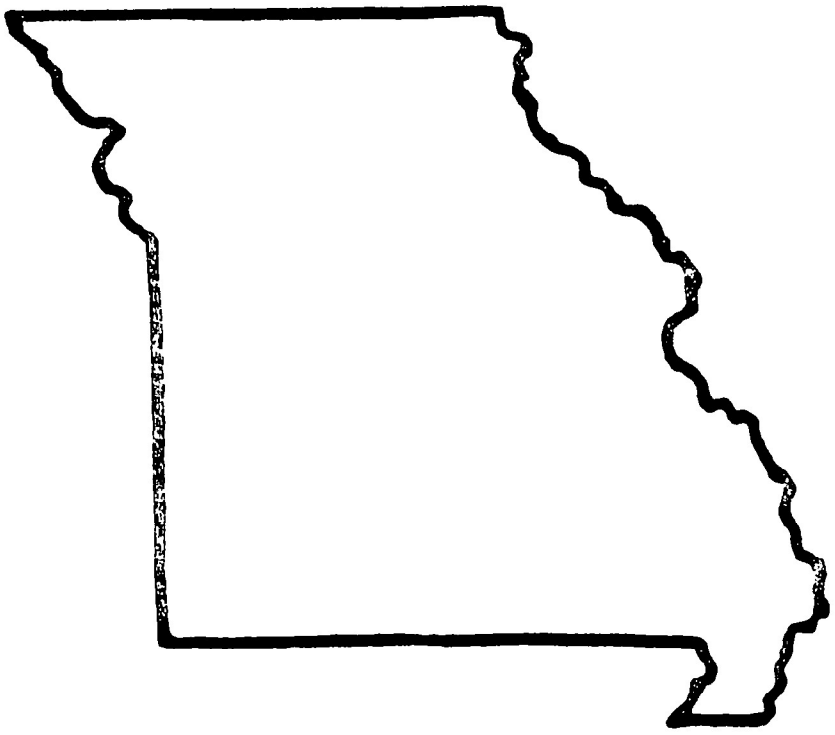

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MISSOURI GRADUATE STUDENT ABSTRACTS

PREFACE

The *Missouri Journal of Research in Music Education*, published by the Missouri Music Educators Association, is devoted to the needs and interests of teachers of music in Missouri and the nation. This issue is the thirtieth.

The members of the editorial committee are grateful to those readers who have written suggestions concerning the content of past issues and request that comments and suggestions again be sent to the editor concerning the content of this issue. We strive for a reasonable balance among music theory, history, philosophy, aesthetics, and pedagogy.

We express our deep gratitude to the Missouri Music Educators Association for their financial support to make it possible to continue to publish the *Missouri Journal of Research in Music Education*.

The Editorial Board

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A COMPARISON OF MUSICAL PERFORMANCE ACCURACY BETWEEN TEACHER-TAUGHT AND PEER-TAUGHT KINDERGARTEN AND FIRST GRADE STUDENTS

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The effects of peer and cross-age tutoring with children and adolescents have been explored with promising results (Topping, 1988). Reviewers of the literature in this area have reported that tutoring consistently benefits the children being tutored, although the critical variables are only beginning to be identified (Alexander & Dorow, 1983; Blackbourn & Campbell, 1991; Bierne-Smith, 1991; Brachfeld-Child & Schiavo, 1990; Cooper, Marquis, & Edward, 1986; Devin-Sheehan, Feldman, & Allen, 1976; Ehly & Larsen, 1980; Madsen, Smith, & Freeman, 1988; McGee, Kauffman, & Nussen, 1977; Prickett, 1987). In addition, researchers have frequently shown that the tutor's performance in the area being tutored improved also (Dinneen, Clark, & Risley, 1977; Greer & Polirstok, 1982; Yogev & Ronen, 1982).

The majority of published studies in peer or cross-age tutoring investigate these techniques with special education populations (Byrd, 1990; Madsen, et al., 1988; Scruggs, Mastropieri, & Richter, 1985; Scruggs & Osguthorpe, 1986; Scruggs & Richter, 1985). Almost all studies involve students 8 years old or older, although Brachfield-Child and Schiavo (1990) investigated the influence friendship has in normal preschool and kindergarten peer tutoring situations. At this age, friends showed greater involvement with their partners, more emotional expression, and a higher degree of competitiveness than did acquaintances. Their work confirmed the findings of Damon (1984) that a strong positive relationship between tutor and tutee enhances learning.

Music has been used to facilitate cross-age tutoring with special education students (Madsen, et al., 1988), but studies involving peer or cross-age tutoring for musical subject matter or skills with normal populations are quite limited (Alexander & Dorow, 1983). Prickett (1985) found peer-tutoring to be an effective method for second grade and older children to learn to play a simple song on the autoharp, but results were inconclusive for kindergartners and first graders, primarily because their digital strength and facility were not sufficiently developed to allow them to manipulate the instrument successfully.

Peer tutoring is not the usual format for teaching music skills in elementary schools, although much informal musical learning probably occurs in this way. This study investigated the effect of peer teaching by very young children on musical performance, specifically using an accessible instrument such as the Omnichord, and on a generalized musical task. It was hypothesized that there would be no difference in the accuracy of the performance of peer-taught and teacher-taught children.

Method

Subjects

Children from a public elementary school, 24 kindergartners and 22 first graders, were selected by their classroom teachers for participation in the

study. The teachers were told that neither academic ability, musical ability, nor musical training were prerequisites for participation. Most of the kindergartners were nonreaders, and at least two children are graduates of a preschool program for special needs children. Genders were almost equally represented, with 24 boys and 22 girls completing the study.

Classroom teachers provided unalphabetized lists of the participating children which were divided into two teaching conditions by assigning alternating names in each grade to one or the other condition. No attempt was made to assign students as future tutors based on any criteria, and friendship variables were left to chance, although all pairs were classmates.

Materials, Equipment, and Preparation

An Omnichord was used for each music lesson. The letter names of the chords were visible on the instrument; additionally, the chord button for C Major was color coded with a red sticker, and chord button for G^7 was coded with a yellow one.

The words for each song were printed in large letters on individual sheets of 8 1/2" x 11" paper. Since students' reading skills were rudimentary at best, above the words accompanied by the C chord were red blocks indicating each C strum, while yellow blocks designated that the G^7 would be strummed. The four introductory strums were not indicated graphically on the sheet. Song sheets were laminated.

Instruction and performance took place in small, quiet, private conference rooms near the students' own classrooms. Each child stood before an Omnichord which was set on a low table with the song sheet propped just above the instrument. The adult music teacher sat to the child's right. Audio tape recorders were used to record sessions. Each session was completed in under 10 minutes.

The two adult music teachers who conducted the sessions hold graduate degrees in music education and have taught in a variety of situations. They used identical scripts for sessions, and they taped and listened to a practice session to ensure consistent and identical presentations, including vocal inflections and reinforcement patterns. These music teachers are not part of the elementary school's faculty and were unknown to the children, as the children were unknown to them.

Procedure: Instruction and Performance

Teacher-taught students. Each child was brought individually to the designated room for a music lesson. The music teacher showed the child the song sheet, said, "We're going to sing this song that I bet you already know, 'Row, Row, Row Your Boat'," and taking the child's hand, asked him or her to point to the words and colors as they sang. Every child indicated recognition of the song and attempted to sing.

Then the teacher brought forward the Omnichord, told the instrument's name, called attention to the red and yellow buttons, demonstrated how she would push the red one and strum four times with her other hand, and asked the child to sing with her again. After this rendition, she asked the child a few review questions about when the two buttons were

pushed and about strumming, then told him or her to try it. Coaching as little as possible, but pointing to the appropriate color blocks on the song sheet, the teacher gave the child two practice trials.

After the second trial, the tape recorder was turned on, the teacher announced, "Ladies and gentlemen! Presenting Jane Doe!", and with no further cues, each child attempted to strum four times and play the song, with the teacher singing softly and pointing to the blocks on the song sheet.

Peer-taught students. A day or two after 21 children, 10 from kindergarten and 11 from first grade, had completed their Omnichord lessons, the music teacher asked each one and a classmate who had been assigned to the peer-taught condition to accompany her to the music lesson room. On the way there, she told the child who had already been taught that he or she was going to show the classmate how to play the Omnichord. Once in the room, the teacher asked both children to sing "Row, Row, Row Your Boat" and to point with her to the color blocks. Then she played the Omnichord while they sang again, telling the tutor to pay close attention to how she played to remember how to do it.

At this point, the music teacher disengaged as much as possible from the lesson. Instructing the tutor to show the classmate how to play, the adult physically backed away a few feet and only intervened if the tutor's desire to demonstrate was resulting in the classmate's getting no chance to try the task alone. However, the music teacher sang softly throughout each trial. After the peer-taught classmate had completed two practice trials, the procedure for introducing and taping the final performance was repeated just as it had been done for the teacher-taught students.

Procedure: Generalization

A day or two after all children had received instruction either from the music teacher or a peer and had been taped performing "Row, Row, Row Your Boat," each peer-taught child returned individually to the music room to play the song again. No further instruction was given. Since most tutors played the Omnichord themselves as a part of their teaching, this extra chance was given for peer-taught children to equalize the amount of experience with the instrument each child received before attempting the generalization task. This session was not taped.

For generalization, the room was arranged as it had been for all the sessions. Each child was told that there would be a chance to try something new. He or she was shown a song sheet and told that this song was different from the other. The music teacher began to sing "Are You Sleeping?", and the majority of children began to sing along, although a few said they had not heard it before. Regardless of its familiarity, the music teacher then said, "What are you going to do when you see the red block?" The student answered. The same question and answer were given about the yellow block. "What do you do with your other hand?" was asked and answered. Holding up four fingers, the teacher asked "How many times do you strum before you begin?" No other coaching was given. After one trial, the performance was taped.

Results

The song sheets graphically depicted 16 possible chords for each song, 14 of which were C (red), and 2 of which were G^7 (yellow). Although the song sheet and the music teacher's demonstration emphasized a 16 chord version of "Are You Sleeping?", a number of students subdivided the beat. For these children's performances, only the accuracy of the chords occurring on the demonstrated strong beats was assessed. Data were analyzed and, after a lengthy interval, reanalyzed to check reliability. Results were consistent in all cases.

For the initial song, "Row, Row, Row Your Boat", the correct chord responses of the peer-taught students ($M = 14.04$) were higher than those of the teacher-taught students ($M = 13.52$), but they did not differ significantly, $t(44) = 1.079$, $p > .05$. The same was true for correct chord responses on the generalization song; peer-taught children ($M = 15.12$) were more accurate than teacher-taught ones ($M = 14.47$), but not significantly so, $t(44) = 1.5238$, $p > .05$.

A comparison was made of the correct chord responses on the initial song versus those on the generalization task. Peer-taught students' average scores on the generalization task ($M = 15.12$) were significantly higher than their scores on the initial song ($M = 14.04$), $t(24) = 6.3903$, $p < .001$. However, teacher-taught students' scores on the generalization task ($M = 14.47$) did not differ significantly from their scores on the initial song ($M = 13.52$), $t(20) = 1.8231$, $p > .05$. Across both conditions, half the students ($n = 23$) received perfect scores of 16 on the generalization task; 15 of these 23 were peer-taught children.

Teacher-taught students remembered to give four initial strums 90.4% of the time on the original song and 95.2% of the time on the generalization song, while peer-taught youngsters' strumming scores were 80% and 92%, respectively. In all conditions, first-graders performed slightly better than kindergartners, but the difference was significant only when peers were being taught the initial song, $t(23) = 3.82$, $p < .001$.

Discussion

This study investigated the effect of peer teaching by very young children on musical performance accuracy when playing an accessible instrument, and on a generalized musical task. The results indicate that under highly structured circumstances, small children can be as effective in teaching their peers a straightforward musical task as an experienced adult music teacher.

In formulating implications for elementary music instruction, a number of considerations should be borne in mind. The musical task was a simple one, the chord changes were minimal, and rhythmic challenges were reduced because the teacher sang at the tempo the child set. More complex musical tasks might field different results. Also, the presence of the adult music teacher undoubtedly focused the children's attention, decreasing the probability of off-task behavior or of instrument destruction. Unsupervised peer teaching might well be less productive. Additionally, the adult's singing may have helped structure the experience for those children whose singing was

nonmelodic. Without at least some form of melodic supplement, live or taped, the results might have been different. Finally, the Omnichord's ease in playing was an indispensable component, since earlier work (Prickett, 1985) has shown that conclusions cannot be drawn about young children's performance when an instrument is difficult for them to manipulate.

On the other hand, it seems clear that under some conditions children's opportunities to make and explore music may be expanded by incorporating peer teaching. Students were able to perform with a rather high degree of accuracy after only two trials on the initial song; following either an experience as a tutor, which usually included playing the instrument another time, or an additional practice trial on the initial song, their performance after one trial on the generalization task was in many cases even better. Peer-taught children performed as well or better than the teacher-taught students, who served as their tutors, in every aspect of the study, a finding which contradicts several studies (Dineen, Clar, & Risley, 1977; Greer & Polirstok, 1982; Yogev & Ronen, 1982). In contrast to most published studies using peer teaching, the tutors in this investigation were not selected because of their mastery of the musical material, although the peers they tutored tended to perform as well or better than they themselves did.

While it is possible that some pairs consisted of close friends, the random nature of the assignment to pairs mitigates against concluding that friendship may have been an influential factor in the success of the peer-taught players. No one openly expressed reluctance to work with the child with whom he or she was paired. Informal observation by the music teachers and classroom teachers concluded that the students regarded the music lessons as being fun. On two occasions mothers, who happened to be in the school during the lessons, came to the music room to observe because their children had reported that they were having fun learning to play a musical instrument.

The performance of children who had previously been identified as special needs children was not noticeably different. Indeed, this identification was not made known to the researchers until after the data had been analyzed.

In kindergarten and elementary settings where the chance to play musical instruments or to expand repertoire is limited due to constraints on music teachers' time, peer teaching in a highly structured and supervised setting could offer children increased opportunities to experience music making. A music teacher or a skilled elementary classroom teacher could set up the task, instruct a few students, and then allow those students to teach their peers, as long as the musical instrument is playable by the children (Prickett, 1985). Since there appears to be no musical prerequisite for successful tutoring, all students in a class could serve as tutors at one time or another.

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A COMPARISON OF KNOWLEDGE OF CHILDREN'S SONGS AMONG OLDER ADULTS, COLLEGE STUDENTS AND CHILDREN

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Song selection has been an issue of continuing concern for music educators and therapists. Recent researchers (Jonas, 1991; Smith, 1991) have emphasized the necessity of determining geriatric music preferences and knowledge of familiar songs in order to facilitate therapy with these populations. Research has demonstrated that the elderly prefer songs which are from their past (Gilbert and Beal, 1982; Prickett and Moore, 1991). Such long familiar songs have been used to stimulate reminiscence of nursing home residents (Wylie, 1990), and as memory aids for Alzheimer's patients (Prickett and Moore, 1991; Lipe, 1991).

Likewise, song selection is considered of primary importance to the musical development of children. Teachers of severely handicapped children judged student ability to sing familiar songs to be the single most important musical goal for that population (Jellison and Wolfe, 1987). Elementary classroom teachers concurred by ranking "selecting appropriate songs" second in importance only to "using music to supplement other curricular areas" relative to information they most needed about music (Saunders and Baker, 1991). Whitlock and Ramsey (1993) thought the topic so important that they surveyed elementary music teachers across Texas, compiling a list of "what songs Texas students ought to know."

When exploring the accepted importance of song selection among education professionals, several unanswered questions arise. Is there agreement about which songs should be learned? Is there a body of song literature that is known throughout our culture? Are there songs that "everyone" seem to know, regardless of age? If so, and if these are songs that children typically learn during the elementary school years, these might become a core of songs that should be learned by both music education and elementary education majors (with their limited time to devote to learning songs), by music therapists working with geriatric populations (with their need to quickly assess which songs might be familiar to elderly clients), and by mentally handicapped children (with their limited abilities to learn large numbers of songs).

Therefore the present investigation was designed to examine consistency in knowledge of songs across various age groups. For the purposes of this study, "knowing" was defined as being able to recall a song title. No effort was made to determine if subjects knew the words or the tune of the song, nor if they recognized the song when they heard it. Since everyone (children through adults) conceivably might have had the opportunity to learn songs as a child, the study was limited to consideration of children's songs in order to include populations with as wide an age spectrum as possible.

Method

Subjects ($N = 107$) consisted of three age groups: 1) older adults ($n = 30$) defined as non-institutionalized retirees over the age of 60 residing in suburban California or rural South Dakota;* 2) college students ($n = 41$) enrolled in "elements of music" courses required of special education and elementary education majors in a southwestern university; and, 3) children ages 7-9 ($n = 36$) defined as students in third grade music classes taught by a music specialist in a suburban Dallas, Texas public school.

Subjects were chosen to encompass as wide an age range as possible, yet have sufficient memory or experience to respond fully to the question; thus non-institutionalized retirees rather than nursing home residents were chosen. Children ages 7-9 were selected since they were regarded as being old enough to know and remember many children's songs, but not so old as to be strongly influenced by popular music (LeBlanc, 1991). Cultural differences, musical experiences, or musical preferences were not controlled in this study, but were assumed to be randomly distributed across subjects. Likewise, for purposes of this preliminary study, no effort was made to control for subject gender, ethnicity, geographical region, religious affiliation, or handicapping condition. Thus age was the only factor explored in this study.

All adult subjects (older adults and college students) individually were asked to respond in writing to the following question:

> Please name as many children's songs as you can. Include any songs that a child younger than 10 years old might sing. Don't limit your ideas. These songs might include nursery rhymes, church songs, holiday or Christmas songs, songs you learned in school, songs from TV or from anywhere else. If you can't think of the exact name of the song, write a partial name or list some of the words to the song. Just jot down every song or part of a song you think that a child might sing.

Since a pilot study indicated that writing names of songs legibly might be a difficult task for youngsters, children were asked to verbalize their list of songs while the experimenter wrote down the names. Their teacher told them to be thinking of all the songs they knew. Then individually they came to a private room near their classroom, where they spoke their answers to the experimenter. After their initial responses, each child verbally was given the same cues as the adult subjects read: Do you know any nursery rhymes? Church songs? Holiday or Christmas songs? Songs from TV or radio? Songs you learned in school? When the children indicated they had listed all the songs they could think of, they were given their choice of brightly colored pencils for "knowing so many songs." Children were also told that if they thought of some more songs, they could write down the names and give them to their teacher to give to the researcher. Several students elected to do this.

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* The author would like to thank Selmer and Grances Nelson of Winner, South Dakota for their assistance in collecting data among the older adult populations.

Results

Resulting data consisted of the frequency with which specific songs were mentioned by the three groups (older adults, college students, children). Descriptive data consisted of: the total number of songs chosen, the number of different songs chosen, the frequency with which songs were chosen, and the consistency with which specific songs were chosen by the three groups. Additional information consisted of the type of songs mentioned. Because of the frequency level of these data, only non-parametric statistics were used.

Frequency counts of total number of songs listed indicated that 2281 songs were listed by the 107 respondents ($M = 21.32$, $SD = 15.87$). The number of songs listed per person ranged from 5-105. See Table 1 for listings by age group. Chi-square analysis of the average number of songs selected by the three groups indicated that college students listed significantly more songs than did older adults or children ($X^2[2, N = 107] = 7.10$, $p < .05$).

Table 1

Number of Songs Listed By Age Group

	Range Of Songs Listed	Total Songs Listed	*n*	*M*	*SD*	Different Songs Listed	Different Songs Listed More Than Once
Older Adults	5-52	463	30	15.4	9.9	241	89 (37%)
Children	6-40	407	36	11.3	7.3	172	49 (28%)
College	13-105	1411*	41	34.4	16.1	296*	158 (53%)*
Total	5-105	2281	107	21.3	15.9	709	296 (42%)

* Indicates significant differences of at least $p < .05$.

Further examination of Table 1 revealed that 709 different songs were listed, with 296 different songs being mentioned more than once. To lessen the effect of a single subject's opinion, all further consideration was limited to those songs mentioned by more than one person. Examination of the percentage of different songs mentioned per age group allowed comparison of the number of different songs chosen per group under unequal *n* conditions. Chi-square comparison of the percentage of songs chosen more than once across the three groups revealed that college students also chose significantly more different songs than did older adults or children ($X^2[2, N = 107] = 8.23$, $p < .02$).

Analysis of the types of songs listed was accomplished by noting the frequency with which songs could be classified into convenient categories. Categories included "Christmas," "sacred" (non-Christmas), "patriotic," "popular" (heard on TV, radio or recordings during the last three years) or "other." It should be noted that no "holiday songs" other than Christmas songs were mentioned by the populations surveyed. Musicians ($N = 2$) experienced

with both popular and children's songs verified the assigning of songs to the above categories. Reliability (agreements / agreements + disagreements) averaged .97 (Patriotic = 1.00, Christmas = .99, Sacred = .93, Popular = .97, Other = .97).

Table 2

Percentage of Songs in Various Categories By Age Group

	Christmas	Sacred (Non-Christmas)	Patriotic	Popular	Other
Older Adults	06.2%	23.2%*	05.8%	00.4%	64.3%
Children	11.1%	08.1%	04.1%	29.1%*	47.7%
College	10.1%	08.8%	04.4%	02.7%	73.4%

* Indicates significant differences of a least $p < .05$.

Chi-square analyses of the frequency with which the three groups chose songs from the above categories indicated that older adults mentioned sacred songs significantly more often ($X^2[2, N=107] = 10.85$, $p<.01$), choosing sacred songs 23% of the time while children and college students mentioned sacred songs 8% and 9% of the time respectively. Children mentioned popular songs significantly more often ($X^2[2, N=107] = 46.31$, $p<.001$). Twenty-nine percent of the children's choices fell into the "popular" category, while only 3% of college students and 0.4% of older adults chose songs from this classification. No other comparisons were significantly different.

Of prominent interest were those songs which appeared consistently on the lists of all three age groups. Only 18 songs of the 709 different songs mentioned appeared more than once on all three lists. The 18 songs appear in Table 3. Of those songs, none are "popular", 1 is "sacred", 1 is "patriotic", 5 are "Christmas" songs, and 11 fall into the "other" category.

The Kendall Coefficient of Concordance (Siegel, 1956) was used to examine possible relationships among the three age groups' selection of the 18 consistently-named songs. Results indicated a positive correlation ($W[2, N=18] = .5894$). A subsequent significance test revealed a significant agreement among the three groups ($X^2[17, N=18] = 30.06$, $p<.05$). Such results imply that the three age groups were in agreement on their choice of these 18 songs, and that the ranking of the frequency with which they selected them was consistent.

Table 3 lists the 18 songs in order based on the ranks of the sums of the three groups' rankings. The total frequency with which each song was mentioned also appears. Note that sums of ranks do not necessarily correspond with the total frequency of mention per song title. Siegel (1956, p. 238) argues that a ranking of the sum of the ranks is the most accurate estimate of the " true" rankings of items in three groups, and a more accurate assessment than ranking total frequencies. Thus, considering all three lists combined, "Jingle Bells" was the favorite, followed by "Jesus Loves Me," "Twinkle Twinkle Little Star," and then "Mary Had a Little Lamb."

Table 3

Consistency of Song Mention:
Songs Mentioned by All Age Groups More Than Once

(In rank Order of Total Sums of Ranks)

1.	Jingle Bells (frequency of mention = 72)
2.	Jesus Loves Me (54)
3.	Twinkle Twinkle Little Star (48)
4.	Mary Had a Little Lamb (48)
5.	America (34)
6.	Silent Night (34)
7.	Old MacDonald Had a Farm (37)
8.	Row Row Row Your Boat (40)
9.	Rudolph the Red Nosed Reindeer (39)
10.	O Susanna (24)
11.	Santa Claus is Coming to Town (23)
12.	Three Blind Mice (29)
13.	Rock a Bye Baby (23)
14.	London Bridge is Falling Down (27)
15.	Yankee Doodle (21)
16.	You are My Sunshine (10)
17.	Farmer in the Dell (18)
18.	O Christmas Tree/O Tannenbaum (10)

Further examination of agreements among song choices between any <u>two</u> groups indicated that 23 additional songs appeared more than once on both the college students and older adult lists; 18 additional songs appeared on both the college students and the children lists, while only one additional song appeared more than once on both the older adult and the children list. These songs are listed in Table 4. Chi-square analysis of the frequency of agreements across the three groups indicated that college students and retirees, and college students and children agreed significantly more often than did retirees and children ($X^2[2, N=96]=8.31, p<.02$).

Because the specific songs chosen by individual groups might be of interest to educators or therapists working exclusively with one age group, Table 5 lists the top ten songs chosen by each age group by frequency of mention. No further analyses were performed on these data.

Results may be summarized as follows:

1. Subjects listed a total of 2281 songs, of which 709 were different titles.
2. Eighteen songs were mentioned more than once by all three age groups.
3. College students listed significantly more total songs and significantly more different titles than did older adults or children.
4. Older adults listed significantly more sacred songs, while children mentioned significantly more popular songs. There were no significant differences among groups on frequency of Christmas or patriotic songs mentioned.

Table 4

Additional Songs Appearing of Two Lists More Than Once

College Students and Older Adults	*College Students and Children*
America the Beautiful	B-I-N-G-O
Are You Sleeping	Deep and Wide
Baa Baa Black Sheep	Deck the Halls
Camptown Races	Deep in the Heart of Texas
Clementine	Happy Birthday
Coming Round the Mountain	Here Comes Santa Claus
Hark the Herald Angels Sing	Itsy Bitsy Spider
I'm a Little Teapot	Peanut Butter Song
Jolly Old Saint Nicolas	Pop Goes the Weasel
Joy to the World	Shoo Fly
My Bonnie Lies Over the Ocean	Whistle While You Work
O Little Town of Bethlehem	
Old Gray Mare	*Older Adults and Children*
Over the River and Through the Woods	
Patty Cake	Old Black Joe
Ring Around the Rosie	
Star Spangled Banner	
Ten Little Indians	
Three Little Fishies	
Up on the Housetop	
What a Friend We Have in Jesus	

Table 5

Most Frequently Mentioned Song Titles: Separate Age Groups

Older Adults

1. Jesus Loves Me (frequency of mention = 17)
2. Silent Night (13)
3. America (11)
4. Jingle Bells (10)
4. Row Row Row Your Boat (10)
6. Three Blind Mice (9)
7. Away in a Manger (7)
8. Brighten the Corner Where You Are (6)
8. Over the River and Through the Woods (6)
8. Twinkle Twinkle Little Star (6)
8. O Little Town of Bethlehem (6)
12. O Susanna (5)
12. Santa Claus is Coming to Town (5)

College Students

1. Jingle Bells (frequency of mention = 33)
2. Jesus Loves Me (32)
2. Mary Had a Little Lamb (32)
4. Itsy Bitsy Spider (30)
4. Twinkle Twinkle Little Star (30)
6. Old MacDonald Had a Farm (27)
6. Ring Around the Rosie (27)
8. Row Row Row Your Boat (26)
8. Rudolph the Red Nosed Reindeer (26)
10. B-I-N-G-O (25)
11. This Old Man (24)
12. London Bridge is Falling Down (21)
13. Frosty the Snowman (20)
13. Rock a Bye Baby (20)

Children

1. Jingle Bells (frequency of mention = 29)
2. There Was a Bowlegged Sailor* (17)
3. You're a Grand Old Flag* (16)
4. Mary Had a Little Lamb (12)
4. Twinkle Twinkle Little Star (12)
6. Ida Red, Ida Blue* (11)
6. Rudolph the Red Nosed Reindeer (11)
8. Old Blue* (10)
9. O Susanna (7)
9. Old MacDonald Had a Farm (7)
11. Ice Ice Baby (Vanilla Ice) (6)
11. Santa Claus is Coming to Town (6)
13. America (5)
13. Can't Touch This (M.C. Hammer) (5)
13. Humpty Dumpty (5)
13. Itsy Bitsy Spider (5)
13. Jesus Loves Me (5)
13. Silent Night (5)
13. Willoughby* (5)

* Indicates songs the children learned in school during the month the interviews were conducted.

Discussion

The most interesting finding appears to be that out of 2281 songs, only 18 were mentioned more than once by all three age groups. Still it is valuable to know that for these subjects there was a consistency across age groups on these 18 songs. Perhaps there is a body of song literature which can be considered basic to our culture. Certainly these subjects agreed on these 18 titles.

Interpretation of the present findings and applications to other situations should be made with caution, however, due to the fact that the research was limited to children from a single elementary school, to college students from a single university, and to retirees from only two geographic areas. Thus results may be regional and may not necessarily be transferable to the general population. Likewise, no effort was made to control for religious or cultural differences, and thus results may or may not be generalizable to more diverse populations.

Nevertheless, these data do present some heretofore unavailable information about the agreement in knowledge of song titles across generational lines. Thus music educators and therapists might choose to use the cross-age familiarity of these songs as a starting point when dealing with the relevant populations. Educators might also consider making these songs a part of the curriculum that all children (especially those with limited abilities to learn songs) should learn. University instructors might consider requiring elementary education majors to know these 18 songs as a minimum requirement for a music-in-the-elementary-classroom course.

It was interesting that so many of the consistently-chosen songs (5 of the 18) fell into the "Christmas Song" category (see Table 3). Of course, "Do you know any holiday or Christmas songs?' was one of the prompts given each subject, but it should be remembered that data were collected during September so few environmental Christmas cues were present. The music of Christmas would appear to be a strong cross-age unifying factor for these subjects. Again, it should be remembered that although no effort was made to determine the religious background of any of these subjects, anyone who mentioned sacred songs, seemed to choose songs from the Christian tradition. Further research might want to explore the song-learning experience for non-Christian subjects, particularly as it relates to music choices in public school settings (Kuhn & James, 1993).

It was intriguing that these young children chose currently popular titles so frequently. (See Table 5 for a list of the most frequently mentioned titles by age group.) Even among these 7-9 year-olds, popular rap songs ("Ice Ice Baby" and "Can't Touch This") appeared as their eleventh and thirteenth most frequent choices. These selections may have been affected by exposure to TV/radio, or may have been the result of a current cartoon show (Hammerman) which featured the performers of these titles. A probable conclusion might be that "rap" style music is now part of the mainstream of our culture, even for these relatively young subjects who are usually not as affected by popular music culture as older students (LeBlanc, 1991).

College students appeared able to list many children's songs (see Table 1). Children, however, exhibited some difficulty in naming songs. Not surprisingly, most mentioned songs which they were currently learning in music

class (see Table 5). Many verbalized that they knew a lot of songs but that it was hard to think of them right away, even when given a series of memory prompts such as "Do you know any songs from TV?" Older adults expressed the same problem, but approached the task with a great deal of enjoyment. Many spoke of how much they liked remembering the old songs.

It should be remembered that "knowing," for the purposes of this study, was limited to the ability to recall a song title. Perhaps further research may want to address whether "knowledge of songs" can be measured effectively by simply asking subjects to name song titles. Although verbal or written report is one of the most frequently used measures of musical response (LeBlanc, 1984), research indicates that what subjects say and what they do are not necessarily highly correlated (Geringer, 1983). The fact that 18 titles did appear consistently on all lists, however, indicates that these eighteen tunes were available in the memory of many subjects regardless of age. There may be additional songs which are very familiar to subjects if they could hear them performed rather than merely listing their names. Further differences might occur if subjects were asked to sing or hum the songs they said they knew (Killian, 1993). Indeed, several subjects were observed humming the tunes as they tried to remember titles. Others hesitated to participate in the study until they were told that they only had to list titles, not sing them for the experimenter. Thus how the term "knowledge of song" is defined (listing names of songs vs. recognition of song titles vs. ability to perform the song) might dramatically affect the results and be a fruitful area for future research.

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INSTRUMENTAL STUDENT MOTIVATION: AN EXPLORATORY STUDY

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Understanding student motivation has long been a concern for researchers and educators. Numerous theories of motivation have been developed in an attempt to increase student involvement and interest in learning. Research has identified intrinsic and extrinsic factors that affect student motivation.

Newby (1991) observed four basic categories of motivational strategies used by 30 first-year elementary school teachers and their effects on student on-task behavior. The four categories of strategies were: attention-focus, relevance, confidence-building, and satisfaction. Attention-focus strategies were those that aimed at getting and maintaining students' attention. Relevance strategies included those that helped students relate the task to their personal experiences. Confidence-building strategies helped students accomplish challenging but achievable goals. Satisfaction strategies were those based on extrinsic rewards. Results from the study indicated a significant positive correlation between student on-task behavior and teacher use of relevance strategies.

Pintrich and De Groot (1990) examined the relationships between three different motivational components (*i.e.*, expectancy component; value component; affective component), three types of self-regulated learning components (*i.e.*, students' metacognitive strategies, students' self-management and control of effort, and the actual cognitive strategies that students use to comprehend the material), and student performance on classroom academic tasks. Results from this study showed that intrinsic value was not significantly related to student performance but was strongly related to student use of cognitive strategies and self-regulation. Students who were motivated to learn and perceived their academic task as important and interesting were more cognitively engaged in learning and more likely to be self-regulating and persistent.

The importance of students' self-motivation and positive self-control has been supported by other studies (McCombs, 1982; Roberson, 1987; Lowman, 1990). In the report of a five-year research program which aimed at modifying the learning strategies of military technical training students, McCombs concluded that the most important motivational component is the concept of positive self-control. In order to be able to take positive self-control, students need to develop strategies and skills such as active information processing strategies, self-management strategies, and self-reward strategies. McCombs believed that promoting positive self-control would lead to both learner satisfaction and motivation. Learner satisfaction and motivation would, in turn, contribute to improvement in performance.

Other student characteristics have been found to be related to motivation. Students' concern for security, home, and parents seems to affect the performance of high school bands (Cairni, 1981). The perceptions of success and failures of band members are related to motivation (Chandler, Chiarella, & Auria, 1987). Students' beliefs about the causes of their

successes and failures have an effect on achievement (Asmus, 1986; 1990; Bar-Tal, 1978; Costa-Giomi, 1989; Weiner, 1984).

While many studies of motivation have focused on student characteristics, others have focused on teacher behaviors. It has been suggested that in order to help students maintain their interest in learning, teachers should provide more positive than negative feedback (Forsythe, 1975; Kuhn, 1975; Murray, 1975; Price, 1983). Lowman (1990) stated that teachers should avoid emphasizing their power over students and should help them to experience the inner satisfactions of learning and achieving. Goldberg (1990) suggested that instrumental teachers need to understand the thoughts, ideas, and learning processes of individual students in order to promote a more effective and collaborative teaching-learning experience.

While existing studies consistently support the value of developing student motivation, little research has investigated the specific factors that affect the motivation of intrumental students. The purpose of this study was to identify factors which may influence students' motivation to play and practice their instruments. It also examined whether instrumental teachers, performance, and non-performance students agree about the relevance of these variables as motivating factors.

Method

Thirty-two instrumental students (18 performance majors and 14 non-performance majors) and 9 instrumental teachers at a large Canadian university participated in the study. Performance students had played their instruments for 6 to 24 years and non-performance students for 4 to 20 years.

A list of motivating factors was developed based upon suggestions from instrumental musicians and a review of related literature (Asmus, 1990; Caimi, 1981; Chandler, Chiarella, & Auria, 1988; Pintrich & De Groot, 1990). The list was further examined by two music professors and four graduate music students. The final version of the list included 14 student-related or teacher-related factors. Student-related factors were: (a) attendance at concerts and recitals; (b) participation in concerts, master classes, and contests; (c) music listening experiences related to student's repertoire; (d) parental expectations' (e) peer pressure; (f) self-expectations; (g) relationship with the teacher; (h) performance of a repertoire in which the student was interested. Teacher-related factors were: (a) enthusiasm for teaching; (b) willingness to accept students' opinions; (c) positive and encouraging attitude towards students; (d) high expectations of students; (e) concern for students' career development; and (f) confidence in their student success.

Subjects were asked to rate each factor according to its contribution to students' motivation to play and practice an instrument on a five-point Likert scale. A rating of "1" indicated that the factor had little effect on student motivation, whereas a rating of "5" indicated that the factor significantly motivated students. Additional questions in the students' form gathered information regarding their instrumental experience, major, and customary level of motivation to play and practice. The forms included a free-response section in which subjects could list other factors not included in the questionnaire.

Results

In order to examine whether teachers, performance majors, and nonperformance majors differed in their responses to the questionnaire, a two-way ANOVA with repeated measures was performed for each of the two sets of ratings (*i.e.*, ratings for student-related and teacher-related factors). The results of both analyses indicated no significant differences in the ratings of the three groups of subjects. Significant differences were found among student-related factors (Table 1) and teacher-related factors (Table 2). No significant interactions between variables could be established.

Table 3 presents the mean ratings for each of the eight student-related factors. Tukey pair-wise comparisons showed that factor 4 (parental expectations) was rated significantly lower than all other factors. Factor 5 (peer pressure) was rated significantly lower than Factors 2 (participation in performances), 6 (self-expectations), 7 (relationship with teacher), and 8 (playing appealing repertoire). Factor 8 received a significantly higher rating than Factor 1 (attendance at concerts).

Table 1

ANOVA with repeated measures for Group on Student-related Factors (St. Factors)

Source	*df*	Sum of Squares	Mean Square	*F*	*p*
Group*	2	.98	.49	.19	.83
Error	38	99.85	2.63		
St. Factors	7	129.16	18.45	18.40	<.01
Group x St. Factors	14	14.11	1.01	1.01	.45
Error	266	266.77	1.01		

* Group: performance majors, nonperformance majors, and teachers.

Table 2

ANOVA with repeated measures for Group on Teacher-related Factors (Tch. Factors)

Source	*df*	Sum of Squares	Mean Square	*F*	*p*
Group*	2	.54	.27	.09	.91
Error	38	113.96	3.00		
Tch. Factors	5	18.38	3.68	8.45	<.01
Group x Tch. Factors	10	2.57	.26	.59	.82
Error	190	82.71	.44		

* Group: performance majors, nonperformance majors, and teachers.

Table 3

Mean ratings of student-related motivating factors

Factor	*M*
1. Attendance at concerts/recitals	3.60
2. Participation in concerts/contests	4.09
3. Music listening experiences related to repertoire	3.70
4. Expectations from parents	2.16
5. Peer pressure	3.26
6. Self-expectations	4.14
7. Warm, good relationship with teacher	4.05
8. Performance of interesting repertoire	4.31

Table 4 lists the mean ratings of teacher-related motivating factors Results of Tukey pair-wise comparisons indicated that Factor 5 (teacher concern for student's career) was rated significantly lower than Factors 1 (teacher enthusiasm), 2 (teacher acceptance of student's opinions), and 3 (teacher positive and encouraging attitude). Factor 6 (teacher's confidence in student's success) was rated significantly lower than Factors 1 and 2.

Table 4

Mean ratings of teacher-related motivating factors

Factor	*M*
1. Enthusiasm for teaching	4.39
2. Willingness to accept students' opinion	4.14
3. Positive/encouraging attitude toward students	4.40
4. High expectation of students	3.98
5. Concern for students' career development	3.60
6. Confidence in student's success	3.86

Students participating in the study were asked to report how motivated they usually were to play and practice their instruments. Three levels of motivation were established; high, medium, and low. Because only one student reported having low motivation, the data from this student was excluded from further analyses. Two-way analyses of variance with repeated measures were conducted with motivation level (high and medium) as the independent variable and ratings for student-related factors and teacher-related factors as the dependent variables. Motivation level did not affect students' ratings of either set of motivating factors significantly. As in the previous analyses, significant differences among student-related factors ($F[7,203] = 13.03$, $p < .0001$) and teacher-related factors ($F[5,145] = 5.84$, $p < .0001$) were found. No significant interactions between variables could be established.

The free response section in the questionnaire gathered additional comments from instrumental teachers and students. Teachers believed that students' own involvement, love, and commitment to music, and students' enthusiasm for learning are the most important motivating factors. Instrumental students suggested additional factors that affect their motivation to play/practice their instruments: better practice facilities, listening to their own recordings, theoretical understanding of the music, teachers' ability to develop students' potential, reactions from the audience, and personal satisfaction and pleasure.

Discussion

In this study, instrumental teachers and advanced instrumental students agreed on what motivates and does not motivate students to play and practice their instruments. This finding is certainly positive, because it suggests that both teachers and students approach the sometimes problematic task of students' practice in a similar way. They both think that the most important teacher-related motivating factors are the teacher's enthusiasm and encouraging attitude and the most relevant student-related motivating factors are performance of appealing repertoire, involvement in performances, and self-expectations. They also agree that parental, peer, and teacher's expectations contribute very little to the motivation of students to play and practice.

However, it should be noted that the student sample of the study was very selective as it included only advanced instrumental students. These students had the motivation to play and practice their instruments as demonstrated by their standing in a highly competitive music program at a major university and by their self-reported motivational level. They probably had high professional expectations, opportunities to participate in performances and master classes, and the tools to play a vast repertoire. It seems natural that parental expectations or teacher concerns were considered minor motivating factors at this stage of their careers. Future research may investigate whether less advanced students agree with the importance of the factors reported in the present study.

Nevertheless, it seems that for instrumental students, opportunities to select repertoire they like and to participate in performances might increase their willingness to practice. Teachers should consider providing their students with these opportunities as much as possible. Even beginning instrumentalists might be capable of participating in class recitals and selecting a few pieces from those suggested by the teacher. Teachers should also be attentive to their attitude towards students, because their enthusiasm and encouragement seem to be strong motivating factors even for advanced students.

Students suggested other motivating factors they considered important to play and practice their instruments. They believed that their own theoretical understanding of music and teacher's ability to develop students' potentials contribute significantly to their motivation. These factors have certainly been considered as most important in music programs that strive for excellence in teaching and a well-balanced curriculum.

Students also reported that it is important to have good practice facilities and opportunities to listen to their own recordings. These last two factors, which are usually out of the control of instrumental teachers, are often the concern of music school authorities and administrators. Although it might be difficult to provide students with optimal practice and accessible recording facilities, they should be considered important elements of an instrumental program.

Interestingly, both students and teachers suggested that the love for music and commitment to one's career are decisive motivational factors. It then seems necessary to find ways to develop these intrinsic motivational variables in those students who do not have them naturally. Future research might investigate this problem. As there is a growing interest in more efficient

and purposeful teaching/learning experiences, the study of student motivation will remain an important concern of researchers and educators.

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TOWARD A BLACK AESTHETIC: THE EFFECT OF RACE ON PREFERENCE AND PERCEPTION OF SELECTED POPULAR MUSIC

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It is projected that by the year 2020 the African-American population, the largest minority population in the nation, will grow from 11.7% indicated by the 1980 census to as high as 15%. By that time it is estimated that African-American children will make up 20% of the school-aged population--one out of every five school children will be black (Jaynes & Williams, 1991). By the year 2000 minority children will account for 42% of all public school students in the United Stated (American Council on Education, 1988). As of 1980 the majority of public primary and secondary school students in over half of the 50 largest U.S. cities were African-American and Hispanic (American Council on Education, 1987).

Reimer (1970) wrote,

> A large body of music exists that can be regarded as unconnected to any particular place, any particular time, and particular ethnic group or any particular race. This is the important literature of Western art music, which is characterized by its universality, its timelessness, its 'color-blindness.' (p. 145)

As the nation's classrooms become more and more culturally diverse such a focus on a particular musical tradition is giving way to a broader range of materials, methodologies and value systems. In a recent article, Reimer (1993) described this broadening scope:

> The peculiarly American cultural reality is precisely captured by...two musical needs--that we are a culture with a particular identification and also a culture with multitudinous identifications, each aspect requiring our respect, devotion, and loving protection. (p. 23)

One possible component of these "multitudinous identifications" has been referred to throughout the writings of many scholars of non-Western music--the existence of a fundamentally unique listening experience determined according to cultural background. Such a phenomenon could carry additional implications for the structure of school music programs as well as the development of teacher education curricula. Though many writers seem to assume the existence of this phenomenon, little quantitative research has been done to examine such a timely and critical issue. Investigating the nation's largest minority population, the purpose of this study is to quantitatively explore the issue of a black aesthetic through the analysis of preferences and perceptions demonstrated towards selected instrumental and vocal popular music.

Henry Pleasants, in his 1969 discourse on the apparent schism between popular and art music, identified the period beginning approximately at the turn of the twentieth century as an "African-American epoch" in music history (p. 90). If one accepts this as an accurate epitaph for the past almost one hundred years, one must consider various implications of such an interpretation of history.

It may be an oversimplification to state merely that the dominance of black performers and pervasive influence of African-American musical styles constitute the entire substance of a fundamental change in historical orientation. According to some writings, discussed hereafter, the black influence in the music of the twentieth century may go beyond the appearance of a large number of artists possessing a like ethnic background; it may also include a set of evaluative processes that may or may not be indigenous to African-American culture--a uniquely black aesthetic.

Though many historical, ethnomusicological, and anthropological studies have identified or alluded to the existence of a black aesthetic, little quantitative research has been conducted in this area. If the twentieth century is to stand as the beginning of an African-American epoch in music history, then exploration of this assumed aesthetic might offer consequential insight into many areas of social, cultural and artistic scholarship. Curtis was focusing on the educational aspect of such inquiry when he wrote that "by identifying attributes that are unique to the black aesthetic experience, music teachers can explore, understand, and become sensitive to the emotions embedded in the music" (p. 24).

Maultsby (1990) wrote that "black music tradition does not adhere to European-American aesthetic values." It is generally accepted that aesthetic response arises from the dynamic interaction between artist, art object, and perceiver. In the case of music this translates into performer (who may also be composer), composition (as it is performed) and listener. Previous research has indicated that this interaction may be culture-specific and that such cultural experiences influence musical perception (Lynch, Eilers, Oller, & Ubano, 1990). The notion that the black listener is employing an entirely different set of evaluative tools appears in numerous writings on African-American culture. Stephens (1986) believed "the significance that one attaches to cultural things can be rooted in ethnicity or be culturally determined" (p. 183). Maultsby (1990) stated that audience response is predicated on the creation and interpretation of songs "within the aesthetic boundaries framed by black people" (p. 194). Burnim (1985) said that "the music of any culture is bound by its own qualitative standards, such is the case with the music of Black people in the United States" (p. 156).

Other studies have pointed to African musical traditions as the source for this unique aesthetic perspective (Wilson, 1974). The role of art within a specific cultural context was discussed by Scott (1990) who wrote "music is no more international than other forms of cultural expression" (p. 399). Addressing African culture in particular Bebey (1975) stated, "In a musical environment whose constant purpose is to depict life, nature, or the supernatural, the musician wisely avoids using beauty as a criterion because no criterion could be more arbitrary" (p. 115). This distinction was applied to American musical style by Lundquist (1991) who said, "If jazz is examined

through an African lens, a very different musical soundscape appears than that revealed through a European lens" (p. 29).

Technical dimensions of this unique aesthetic were discussed by Stephen (1986) who identified context, time, rhythm and form as four parameters of particular distinction in black music. Burnim (1985), in her study of gospel music, identified time, text and pitch as three basic components constituting a "structural network" for interpretation. Lundquist (1991) proposed that the culture-specific use of the basic musical elements must be examined within their environmental context as well as within the processes of performance (improvisation, interpretation), creation (inspiration, composition, improvisation) and listening (attending, analysis, reflection). Specific examples of this usage of musical elements by black musicians include altered instrument fingerings, unconventional embouchures, unique playing positions, muting and sound distortion (Maultsby, 1985).

Quantitative study in this area has been limited. Several studies have been conducted indicating trends in racial preference (Appleton, 1970/1971; Meadow, 1970/1971; Berlyne, 1977; Jaynes, McCullers, MacNeil, and Vafaie, 1985). Both Appleton and Meadows found that race is a significant factor in determining musical preference. Appleton described the difference between musical style preferences of white and black college students with black students preferring soul, jazz and black gospel. Jaynes, et al. found white, midwestern Dixieland performers to prefer Dixieland music while black New Orleans performers preferred the more black-oriented Uptown jazz music. A similar study involving college nonmusicians replicated these results.

In search of factors affecting preference, additional studies demonstrated the effect of same-group associations on preference responses (Hraba and Grant, 1970; May, 1985; Killian, 1990; McCrary, 1990/1991). Hraba and Grant found that both black and white children tended to prefer dolls identified as representing their own ethnic group. May found no significant difference in the musical preferences of first, second and third graders except in instances of examples featuring clear racial associations, in which case significant same-race preferences were shown. Killian found that junior high students tended to prefer same-race musical models. Black students tended to choose black models while white students were more apt to choose both white and black models. McCrary found that the same tendencies were true of both middle-school and college students: Black students strongly preferred selections by black performers while white students showed an almost balanced preference distribution.

Hoard (1990) and Logan (1990) addressed perception by asking subjects to organize a collection of paintings according to style and subject-generated categories in the former study and according to artist in the latter. Results indicated that the race of both subject and artist had a significant effect on subject response. Interpretive capabilities of white and black students were examined by Brown and Schulze (1990) in the context of two Madonna music videos. Though Madonna's albums performed equally well on both white and black music industry charts, significant differences were found between the interpretation of the songs' stories with strong disagreement demonstrated over the most fundamental story elements.

Similar to McCrary (1990/1991), this study investigated preferences and perceptions expanded here to include both vocal and instrumental musical

examples from the popular idiom. Black and non-black students' preferences for each example as well as perceptions of principal performers' race were recorded and examined.

Method

Subjects ($N = 289$) were undergraduates at three large southern universities representing all level classifications and various majors including music. Approximately half of the subjects ($n = 144$) were asked to respond according to preference for each of the musical examples while the remaining subjects ($n = 145$) were asked to respond according to their perceptions of the performer's race. In the case of vocal examples, this referred to the principal soloist.

The responses were then analyzed for relationships between the subjects' ethnicity and both preferences (black, $\underline{n} = 63$; non-black, $\underline{n} = 81$) and perception (black, $\underline{n} = 73$, non-black, $\underline{n} = 72$). Ethnicity was determined by subjects' response to a brief questionnaire included as part of the response form. Categories included Hispanic, African-American, Native American, Caucasian, Asian and Other. For the purposes of this study all subjects responding to categories other than African-American were considered non-black; this included 146 Caucasian subjects, 2 Hispanic subjects, 4 Native American subjects and 1 Asian subject. To de-emphasize a possibly apparent racial focus for students assigned to the preference task, the questionnaire also requested information regarding subjects' age, year in school, major and gender.

Two response forms, each including written directions, were used: the first tested preferences for each of the examples using a five-point Likert scale anchored by <u>like</u> and <u>dislike</u>; the second tested perceptions of performers' race using a five-point scale anchored by <u>most likely black</u> and <u>most likely not black</u>. Again to avoid preference bias arising from an obvious focus on racial issues subjects completed only <u>one</u> of the two randomly distributed forms though both test forms were administered simultaneously.

The stimulus tape consisted of twelve brief musical excerpts consisting of six vocal and six instrumental examples representative of various twentieth century popular music styles (Table 1). Instrumental selections were used in addition to vocal selections to minimize extra-musical cues possibly affecting preference. The twelve sections, though presented individually, were divided into six pairs matched according to style and idiom. Three of the pairs were performances of the same piece by different artists; the other three pairs were closely related in duration, tempo, instrumentation, and texture. Instrumental pairs included traditional jazz with featured soloist, big band, and fusion. Vocal pairs included jazz, rhythm and blues, and contemporary ballad styles. Excerpts included only complete musical units (e.g., phrases, verses, solos) and concluded at an identifiable cadence point or formal division. Within each pair corresponding segments of the selections were used resulting in slight variance in duration between examples, most notably in the pair representing vocal rhythm and blues. Selections were presented in one of two random orders.

Results

Separate scores were tabulated for perception and preference responses. Perception rankings were assigned numerical values ranging from 1, indicating the highest probability that the artist was black, to 5, indicating the highest probability that the artist was not black. Preference rankings were also scored using a five-point scale with 1 being most positive and 5 being least positive. To allow comparison of responses to performances by black and

Table 1. Musical examples

Title/Performer	Race/Style	Presentation	Duration
"Some of These Days" Louis Armstrong	(instrumental) black, trad. jazz	12,11	0:44
"Some of These Days" Bob Scobey	(instrumental) non-black, trad. jazz	5,8	0:38
"One O'Clock Jump" Count Basie	(instrumental) black, big band	4,5	1:08
"One O'Clock Jump" Glen Grey	(instrumental) non-black, big band	7,2	1:04
"Contusion" Stevie Wonder	(instrumental) black, fusion	9,12	1:10
"Sunwheel" Paul Winter Consort	(instrumental) non-black, fusion	2,7	1:14
"Blue Skies" Ella Fitzgerald	(vocal) black, jazz	10,6	0:44
"Easy to Love" Diane Schur	(vocal) non-black, jazz	11,3	0:55
"Good Rockin' Tonight" Wynonie Harris	(vocal) black, r & b	6,9	1:05
"Good Rockin' Tonight" Elvis Presley	(vocal) non-black, r & b	3,4	0:47
"For Sentimental Reasons" Natalie Cole	(vocal) black, ballad	1,10	0:55
"Spring Can Really Hang You Up the Most" Bette Midler	(vocal) non-black, ballad	8,1	0:58

non-black artists, each subject's response scores were separated accordingly and averaged to produce a mean score for examples by black performers and a mean score for examples by non-black performers. Each subject's scores were further separated by example type and averaged to produce a mean score for instrumental performances by black artists, a mean score for vocal performances by black artists, a mean score for instrumental performances by non-black artists and a mean score for vocal performances by non-black artists, a total of 6 mean scores per subject.

Two separate, random presentation orders were constructed to minimize the possibility of bias due to order of excerpt presentation. To test whether presentation order had a significant effect on subjects' responses, scores from each of the 12 examples were separated by task and subjects' ethnic group, then separated by order and averaged to produce four matched sets of scores--preference scores for black subjects, preference scores for non-black subjects, perception scores for black subjects and perception scores for non-black subjects. If subjects responded similarly to the examples regardless of placement on the stimulus tape, a strong relationship should exist between the scores for each order. Using the Spearman Rank Correlation Coefficient strong positive correlations were found between orders for black subjects' preference scores ($rho = .77$, $p < .05$), non-black subjects' preference scores ($rho = .75$, $p < .05$), black subjects' perception scores ($rho = .79$, $p < .05$), and non-black subjects' perception scores ($rho = .79$, $p = .05$). Both sets were subsequently combined for further analysis.

One purpose of this study was to compare perceptions and preferences of black ($n = 136$) and non-black ($n = 153$) subjects. These totals reflect the prior elimination of unusable survey forms ($n = 18$) including forms lacking information on each subject's ethnic background and forms with more than one answer for any example. Table 2 shows the mean scores and standard deviations for the subject and response categories.

Comparison of perception responses using Mann-Whitney U tests showed a significant difference between black and non-black subjects' identification of the performer's race for all examples by black artists ($z = -4.58$, $p < .001$) as well as all examples by non-black artists ($z = -2.59$, $p < .01$). For examples featuring black performers a significant difference was found in subjects' perceptions of instrumental performances ($z = -5.53$, $p < .001$) but not in perceptions of vocal performances ($z = -1.56$, $p > .05$). Conversely, for examples featuring non-black performers a difference was found in subjects' perceptions of vocal performances ($z = -2.45$, $p < .05$) but not in perceptions of instrumental performances ($z = -1.76$, $p > .05$).

A similar comparison of preference responses revealed a significant difference between subjects' preference for the examples by black performers ($z = -4.22$, $p < .001$) but no difference between preference for the examples by non-black performers ($z = -.02$, $p > .05$). For all examples featuring black performers significant differences were found between preference responses for both instrumental performances ($z = -4.47$, $p < .001$) and vocal performances ($z = -3.08$, $p < .01$). No difference was found between preference responses for vocal performances ($z = -.10$, $p > .05$ or instrumental performances ($z = -.09$, $p > .05$) for examples featuring non-black performers.

In addition to comparison of black subjects' responses with those of non-black subjects this study also sought to compare subjects' perceptions of

Table 2. Comparison of examples by black vs. non-black artists

Examples	Perception				Preference			
	Black subjects (n = 73)		Non-black subjects (n = 72)		Black subjects (n = 63)		Non-black subjects (n = 81)	
	M	SD	M	SD	M	SD	M	SD
All black	2.00	.52	2.40	.43	2.55	.72	3.13	.75
All non-black	3.08	.54	3.30	.47	2.91	.64	2.90	.70
Black vocal	1.88	.75	2.05	.69	2.42	.90	2.90	.86
Non-black vocal	3.51	.69	3.77	.61	3.00	.77	2.98	.81
Black instrumental	2.12	.65	2.75	.62	2.68	.81	3.35	.82
Non-black instrumental	2.64	.69	2.83	.64	2.82	.74	2.83	.81

Perception scale: 1 = Most likely black . . . 5 = Most likely not black

Preference scale: 1 = Like . . . 5 = Dislike

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and preferences for performances by black and non-black artists. Using Wilcoxon Matched-Pairs Signed-Ranks tests, analysis of black subjects' perception scores revealed a significant difference between responses to examples by black artists and responses to examples by non-black artists ($z = -7.19, p < .001$). This difference was also shown between vocal performances ($z = -7.06, p < .001$) and instrumental performances ($z = -4.38. p < .001$).

Perception scores of non-black subjects also showed a difference between performances by black and non-black artists ($z = -7.08, p < .001$). Within this category, however, the significant difference between perceptions of black and non-black artists' vocal performances ($z = -7.22, p < .001$) was not matched by perceptions of instrumental performances ($z = -.66, p > .05$).

A significant difference in black subjects' preference responses found for all musical examples ($z = -4.35, p < .001$) was not consistent within subgroups; the significant difference between responses to vocal performances ($z = -4.71, p < .001$) was not matched by responses to instrumental performances ($z = -1.70, p > .05$). Inconsistency was also found among non-black subjects' preference responses. Though a significant difference was found in responses for all examples ($z = -5.05, p < .001$), the difference between preference responses to instrumental performances ($z = -6.22, p < .001$) was not matched by responses in the vocal subgroup ($z = -.86, p > .05$).

Mean scores were calculated for each example according to group (black, non-black) and task (preference, perception) in order to compare rankings according to preference with perception scores. Spearman Rank Correlation Coefficients demonstrated a low positive correlation among perception and preference scores for non-black subjects ($rho = .17$) while scores for black subjects demonstrated a moderately high positive correlation ($rho = .72$). Within subgroups black subjects' scores demonstrated a moderate positive correlation for instrumental examples ($rho = .60$) and a moderately high positive correlation for vocal examples ($rho = .77$). Non-black subjects' scores also demonstrated a moderate positive correlation for instrumental examples ($rho = .61$) but a low positive correlation for vocal examples ($rho = .26$).

Discussion

The purpose of this study was to quantitatively examine perceptions and preferences of black and non-black subjects in an effort to shed light on the existence or nature of a unique black aesthetic. Though this phenomenon is often identified by historians, ethnomusicologists, sociologists and others, little quantitative research has been conducted to lend support or cast doubt on the topic.

When interpreting the obtained results it is essential to keep in mind the potential distinction between statistical significance and "real" significance. Apart from the most dramatic mean score differences, most mean scores were within one point on the scale with some pairs within one-quarter point. the meaning of such comparisons and resultant interpretations must be approached with caution.

The first aspect examined was perception, here measured by subjects' identification of performer's race after hearing brief musical excerpts. Mean scores of both ethnic groups indicated that, overall, not only were subjects able

to distinguish between performances by black and non-black artists, they were able to distinguish correctly--a finding consistent with previous research (McCrary, 1990/1991). However, black subjects tended to rate all examples closer to the most likely black end of the perception scale while non-black subjects rated all examples closer to the most likely not black end of the scale.

Vocal performances by black artists were rated similarly by both groups, with non-black subjects tending to rate all vocal performances further toward the non-black anchor. Instrumental examples were rated similarly by non-black subjects regardless of performer's race although examples by black performers were rated slightly further toward the black end of the scale. Black subjects ranked instrumental performances by black artists significantly further toward the black end of the scale. It is interesting to note that despite differences in black and non-black subjects' perceptions of instrumental performances all mean scores for this category fell to the black side of the scale.

Subjects indicated preference response to the same musical examples by marking a five-point scale ranging from like to dislike. Black subjects' overall mean scores indicated a significant preference for performances by black artists, again consistent with previous research (McCrary, 1990/1991); conversely, overall scores of non-black subjects indicated a significant preference for performances by non-black artists. Mean scores for instrumental examples indicated that black subjects did not significantly prefer either performances by black or non-black artists while non-black subjects significantly preferred examples by non-black artists. For vocal examples black subjects' scores indicated a significant preference for performances by black artists while no significant difference was found in non-black subjects' scores.

It is interesting to note that with removal of overt racial cues in the form of identifiable vocal performances black subjects' stronger preference for musical examples by black performers statistically disappeared. This finding coupled with the higher correlation between black subjects' perception and preference responses compared to non-black subjects' responses, may support previous findings that black subjects tend to respond more positively to stimuli carrying apparent same-group associations (Hraba and Grant, 1970; May, 1985; Killian, 1990; McCrary, 1990/1991). This does not take into account differences in instrumental perception scores; since the performances used in this study were presented aurally this could suggest that elements within the music itself may have provided clues to the performer's race.

Results of this study do not in any way prove or disprove the existence of a black aesthetic. However, differences found between subject groups and across listening examples seem to indicate the value of further research. Clearly further research is needed to examine the relationship between perception and preference particularly as influenced by ethnicity. The near impossibility of controlling for all musical parameters within the context of listening examples such as those used in this study suggests the need for subsequent studies isolating individual musical elements such as rhythm, timbre, pitch and articulation.

Though many educators agree that the culturally diverse classroom brings with it special educational needs, it is still far from clear what those needs might be and how the teaching community can fill them. As music educators, one of our primary goals is to provide students with positive and

stimulating musical encounters and experiences. The growing body of research into the possible relationships between ethnicity and musical preference and perception may provide insights into how these positive experiences might be related to or determined by cultural background and, in turn, direct us towards materials and practices that could allow us to maximize the learning experience for each of our students and broaden the learning experience for all of our students.

It is for others to argue the truth of Henry Pleasants' claim that the twentieth century marks an "African-American epoch" in music history. There can be no question, however, that African-American contributions have been a significant part of modern America's musical foundation. The suggestion of a particular black aesthetic cited so frequently in the writings of the past several decades certainly implies the possibility of a culture-specific listening experience across all ethnic groups. Further study should expand beyond comparison of black and non-black samples to include members of other cultures, each of whom makes a vital contribution to the diversity of the contemporary classroom.

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SUITABILITY OF A PERSONAL HEART RATE MONITOR FOR USE IN MUSIC RESEARCH

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There has been a long tradition of using the individual's physiological response as a dependent variable in music research. Physiological dependent variables have been especially prominent in music therapy, music preference, and performance anxiety investigations. Physiological measures, especially heart rate, could also be useful in monitoring progressive levels of physical exertion during practice and performance, with the instructor and the performer using these data in much the same way that the coach and the athlete observe them during training.

Kallman and Reuerstein (1977) describe a wide variety of physiological dependent variables. In practical effect, however, many of these dependent measures are beyond the reach of the typical music researcher. Some require large amounts of money for the researcher to buy and maintain the necessary equipment, some require the user to have a technical background in physiology and in electronic instrumentation, and some are invalid for use in certain kinds of music study by virtue of the way the subject is measured. An example of the latter problem would be that of measuring the palmar skin resistance of a pianist or a percussionist during performance. The part of the body needed as a measurement site would also be needed to perform the music.

Heart rate is one of the more popular physiological dependent variables in music research, as demonstrated by the comparatively large number of studies which have used it in the area of performance anxiety. A few examples would include Wardle's (1970, 1974) pioneering study in which the researcher used a telemetric physiograph to obtain heart rate, and recently completed dissertations by Tartalone (1992) and Brotons (1993, in press) in which the researchers used an updated version of the CIC Heartwatch (the Polar Vantage XL) to obtain heart rate.

Some of the studies we reviewed had used expensive and complex equipment to obtain heart rate data. In recent years comparatively simple and inexpensive equipment for measuring heart rate (similar to the cardiotachometer recommended by Brener, 1967) has appeared on the market in the form of the personal heart rate monitors developed by the personal fitness industry. We designed our study to learn if this kind of instrument might offer a way for music researchers with modest funding and limited technical background to collect heart rate data in music research.

The purpose of this study was to select and purchase a high quality heart rate monitor, conduct a field trial of this instrument in the context of music research, and report our results and advice for researchers who may want to use a heart rate monitor.

Method

We began this study in 1989 with an attempt to identify the best heart rate monitor among those that were then available. We sought the advice of professors and active researchers in physical education and exercise physiology, doctors specializing in sports medicine, trainers and coaches of university athletic teams, physical therapists, fitness counselors, athletes in several sports, both team and individually oriented, and owners of fitness centers and retail stores specializing in fitness equipment.

We studied articles which evaluated some of the available monitors (Delhagen & Burfoot, 1986, September), and which presented detailed information on the validity and reliability of these instruments (Leger & Thivierge, 1988). A monitor named the AMF Quantum XL had performed very well in these tests, demonstrating correlations of .95, .95, and .97 with a simultaneously recorded electrocardiogram (ECG) taken during step test, treadmill, and bicycle ergometer exercise, respectively (Leger & Thivierge, 1988, p. 146).

The AMF Quantum XL was highly recommended in each article, and its ability to accumulate readings in memory and store time-of-day and optional event markers in the same data file made it a strong candidate for research use. Prior to the beginning of our study, Computer Instruments Corporation acquired the Quantum XL from AMF and renamed it the CIC Uniq Heartwatch, Model 8799. It should be noted that this instrument is made in Finland by Polar Electro, and it is marketed under different names by distributors in different countries. Computer Instruments Corporations, 100 Madison Avenue, Hempstead, NY 11550 is the American distributor.

We bought two CIC Uniq Heartwatches, Model 8799, from an authorized dealer at the regular retail price of $369.00 each. Our instruments came from regular stock and were not select in any way. An interface and software capable of uploading accumulated data to either an IBM or Apple IIc personal computer were available for $499.00, but we elected not to buy this equipment because we wanted to evaluate the heartwatch as a low cost way of acquiring physiological data.

Description of the Heartwatch

The CIC Uniq Heartwatch is configured in three parts: (a) an adjustable and elasticized electrode strap which is worn around the chest in direct contact with the skin, (b) a battery powered transmitter unit which snaps onto the outer surface of the electrode strap, and (c) a battery powered receiver unit which is typically worn as a wristwatch. The instrument comes with a one-year warranty which covers the transmitter and receiver, but not the batteries or the electrode strap.

The heartwatch's electrodes sense the electrical signals generated by the heart in the same way as the equipment used to obtain an electrocardiogram. (To forestall any possible fear on the part of our subjects, we called the electrodes "sensors" in all verbal and written instructions that we provided to subjects in this study.) With its buckle engaged and its elastic pulled taut but not stretched, the electrode strap could be adjusted between a minimum circumference of 24 inches and a maximum of 32 inches. The

stretch capability of the electrode straps we sampled was 20 inches of possible expansion beyond the base measurements shown above. A larger size strap is available by special order.

The transmitter unit, which is approximately 140 mm (5 1/2 inches) long, 30 mm (1 3/16 inches) wide, and 12 mm (1/2 inch) thick, broadcasts signals from the heart to the receiver. The receiver has built in functions to report current time of day and current heart rate, to set high and low heart rate limits and sound an alarm if the heart rate goes beyond these limits. The receiver can sample current heart rate and time of day at intervals of every 5 seconds, every 15 seconds, or every minute, and store this information in memory along with event markers which may be inserted at any time during recording. Heart rate may also be sampled and recorded in relation to elapsed time rather than time of day. This would be suitable when subject performance might appropriately be evaluated with a stopwatch.

The receiver will also function as a regular wrist watch which has an alarm feature. The receiver, which is approximately 50 mm (2 inches) long, 45 mm (1 3/4 inches) wide, and 16 mm (5/8 inch) thick, looks like a large athletic-style wrist watch and includes a CMOS 4 bit microcomputer. Figure 1 presents the three components of the CIC Uniq Heartwatch, Model 8799.

Immediately after buying our heartwatches we began using them to record our own heart rates under various levels of exertion. We also loaned the heartwatches to friends and asked for comments from the user's viewpoint. On the basis of this information we decided that our field trial should focus on three major tasks: (a) optimizing instructions for the participating subjects on how to correctly use the heartwatch, (b) identifying and meeting concerns of subjects who are also performing musicians, and (c) determining practical limitations of the heartwatch and recommending ways to work around these limitations.

Optimizing Instructions for Subjects

Our first step in optimizing instructions for subjects was to evaluate the comprehensive 19 page instruction manual that was supplied with the heartwatch. The manual was well printed on good quality paper and was illustrated with numerous photographs which were especially helpful in understanding the different functions of the instrument. The manual included the address of the American distributor, Computer Instruments Corporation, as well as a page of technical specifications.

In our own efforts to familiarize ourselves with the instrument, we noticed that it took a surprisingly long time to learn how to do comparatively simple tasks. It also took a long time to look up and confirm essential parts of programming sequences after we had already largely mastered them. We attributed this difficulty to three problems: (a) the instrument will do so many different things that providing instructions for every possibility makes the manual more complex than would be desirable, (b) the headings in the manual do not say in plain language what the heartwatch will do when placed in a specific program, and (c) the photographs in the manual are sometimes too small to provide optimum detail (as in the section on donning the heartwatch, pages 6-7). We found no incorrect information in the manual.

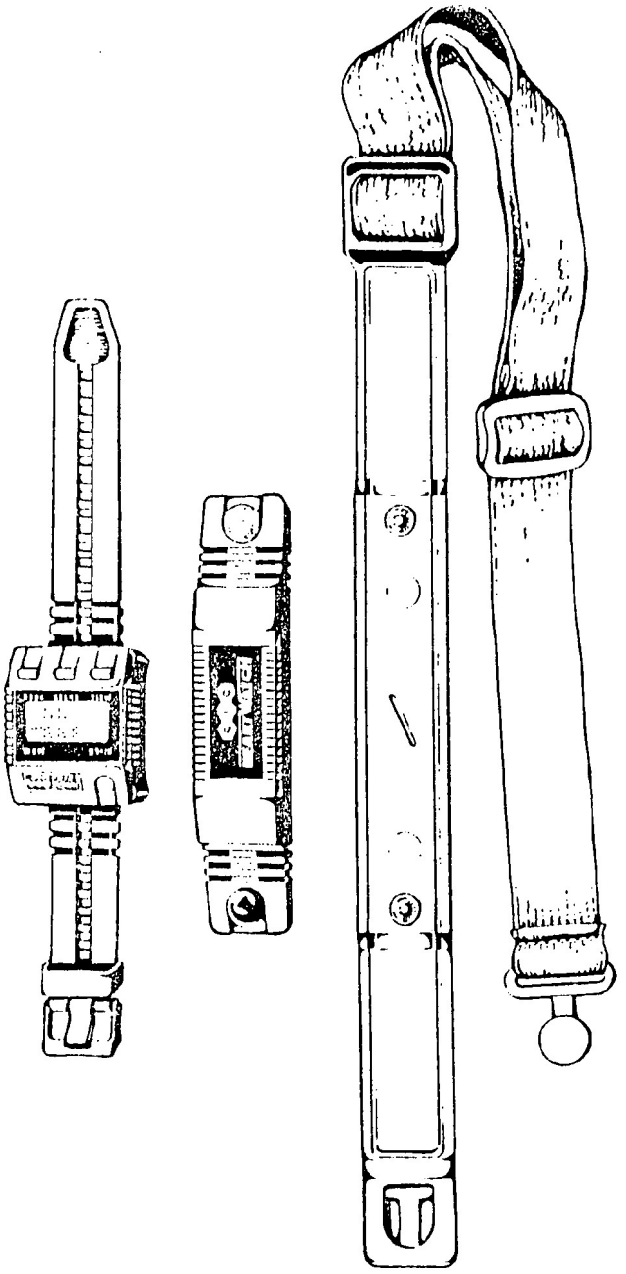

Figure 1. The CIC Uniq Heartwatch, Model 8799. Left to right: electrode strap, transmitter, receiver.

We checked our perceptions of possible difficulty with the manual when we began to loan our heartwatches to others. We got many requests to verbally summarize or demonstrate how to get the watch to do various things. We decided that it would be wise to prepare a simplified manual for the heartwatch, and that we could accomplish this best by simply restricting the number of heartwatch functions we described.

To develop a simplified manual, we first prepared a task analysis of all action needed to don the heartwatch, to get a reading of current heart rate, to store heart rate and time of day in memory, to insert an event marker into the stored data, and finally to recall the stored heart rate and time of day. Next, we photographed a volunteer subject while he was donning the heartwatch and selected the views we thought would be most helpful to those learning to use the instruments.

We brought these photographs, as well as illustrations from physiological measurement textbooks, to a professional graphic artist, who prepared drawings of generalized male and female subjects donning the heartwatch. These drawings were intended to insure that subjects apply the electrode strap to bare skin with sufficient elastic tension as required for optimum electrical contact, to inform female subjects that a typical brassiere would not interfere with the electrode strap, and to guide subjects in applying the electrode strap over that area of the chest most likely to give a strong electrical signal of the heartbeat.

We prepared simplified instructions on use of the heartwatch to accompany our drawings. They were based on the task analysis described above, and we brought the instructions through two cycles of trial and revision. We found we were able to fit the necessary information onto three typewritten pages including illustrations. A copy of our simplified instructions is available to interested researchers upon written request to the senior author.

Identifying Concerns of Subjects

In our own initial work with the heartwatch, we found that our main concerns focused upon putting the instrument on in a way that would optimize measurement while maintaining our own personal privacy. These concerns were echoed by the subjects who worked with us in our preliminary explorations of the instrument.

We felt that the ideal procedure for maintaining personal privacy would be for the subject to don the heartwatch alone in a private dressing room. Researchers could make the necessary arrangements for this if they could have confidence that the simplified instructions provided all the information needed to correctly don the heartwatch. No other issues emerged from preliminary exploration except a concern that the heartwatch might be a distraction or interfere with performance on particular instruments. We wanted to see how prevalent this concern was in a sample of subjects who had used the heartwatch, so we incorporated this concern into the field trial.

Determining Practical Limitations of the Heartwatch

We examined the practical limitations of our equipment in this study by posing the following questions:

1. Does the ambient temperature in which the heartwatch is stored influence its performance?
2. How necessary is it to wet the contact strips on the electrode strap before putting the strap on?
3. In a practical sense, how difficult is it to adjust the length of the electrode strap?
4. Does the standard electrode strap have a wide enough range of length adjustment to permit its use with children?
5. What is the acceptable range of tightness of the electrode strap which will still allow transmission of a reliable signal?
6. How high and how low on the chest may the electrode strap be worn and still generate a reliable signal?
7. Can the receiver operate reliably if not worn on the wrist? If so, what is the range of acceptable conditions?
8. Is the heartwatch susceptible to measurement artifact during data collection? If so, describe the problem(s).
9. Is the heartwatch susceptible to electromagnetic interference in typical music performing conditions? If so, describe the problem(s).
10. Without the computer interface, what is the best procedure for successful manual readout of accumulated data?
11. What is the typical life of the transmitter and receiver batteries under conditions of moderate use?
12. How difficult is it to obtain and replace the batteries in the transmitter and the receiver units?

We found that we were able to address most of these equipment concerns in the preliminary phase of our study, and we needed to design a specific test for only one of the above questions in our field trial.

Field trial data were obtained by having subjects complete a printed three-page questionnaire which was supplied to each subject together with a heartwatch and a copy of our simplified instructions for using the heartwatch. We worked with 51 volunteer subjects, 21 males and 30 females, whose ages ranged between 18 and 40 years, with a mean age of 25 years and a standard deviation of 5 years. Subjects were enrolled for undergraduate or graduate level music instruction in one of two universities located in the Midwestern and Northwestern United States.

Major instruments or performance media represented within our subject sample included cello, clarinet, flute, guitar, percussion, piano, saxophone, trombone, trumpet, violin, and voice. The piano was better represented than any other instrument in our sample accounting for 37% of the whole group. It was followed by voice with 14%, and by trumpet and flute

with 12% each. The mean number of years of music instruction and of music performance experienced by our subjects was 14, with a standard deviation of 6. Subjects donned the heartwatch in private and wore their normal clothing over the heartwatch during the field trial. They filled out their own questionnaire, but one of us was available at all times to respond to questions.

Results

Instructions

New users tended to like our simplified instructions, but they became more comfortable with the published manual as they grew more experienced in the use of the heartwatch. We found no mistakes in the published manual, but offer the following suggestions to improve it: (a) warn users that the "mem bar" on the receiver display is very hard to see because of its location, and (b) include a trouble-shooting guide to help users trace and solve problems, including how to change both the transmitter unit and the receiver unit batteries, and how to know when the electrode strap should be replaced.

Subject Concerns

Subjects were very happy about the arrangement which permitted each person to don the heartwatch alone in a private room. We feel that this arrangement increased the number of volunteers. No subjects reported difficulty in correctly donning the heartwatch.

We received a number of complaints about the way it felt to wear the heartwatch. Subjects whose instruments require a more active use of the left hand complained about the bulk or weight of the receiver unit, and one person even complained about its visual appearance. One subject wrote "Since I am a pianist, anything I have on my hands or wrists affects me in some way. The heartwatch is big and awkward feeling on my arm. But what disturbed me the most was the constant 'clicking,' not exactly because the clicking never remained constant."

We found it interesting that none of the subjects who used the heartwatch in our preliminary explorations had commented about the clicking noise, and we ourselves had noticed it only for a brief period after putting the heartwatch on in a very quiet room. We only received two comments about the clicking, and both subjects reported that the sound was easy to ignore while performing.

Our subjects did not welcome the presence of the electrode strap and transmitter around their chests, but their complaints were generally mild. "The transmitter is comfortable enough to wear," wrote one subject. Another said "The pressure of the transmitter belt affects my breathing a little because of having asthma." It is notable that none of the subjects who wore the heartwatch in our preliminary explorations had complained about the electrode strap and transmitter. The great majority of these subjects had used the heartwatch over an extended period of time, compared to the single session of 20 to 30 minutes during which the field trial subjects used the heartwatch. We hypothesized that wearing the heartwatch becomes less intrusive to a user as the user gains experience with the heartwatch.

Our subjects observed and reported an unintentional biofeedback effect during their use of the heartwatch. One subject wrote "I was more nervous when I saw the heart rate reach 108 while performing." A number of subjects felt that immediate knowledge of their heart rate while performing would make them more likely to become anxious and would accelerate their heart rate further. This might begin a vicious circle of feedback and acceleration.

On our questionnaire, we included two questions asking subjects for their opinions after they had worn and used the heartwatch. One asked subjects to select a response expressing how much they thought it would disturb them to wear the heartwatch while performing music; another asked them how much they thought it would disturb them to wear the heartwatch while listening to music. Available response options were that it would (a) "greatly disturb me" (b) "definitely disturb me" (c) "somewhat disturb me" (d) "disturb me a little" and (e) "not disturb me at all."

In the music performance scenario, 57% stated that wearing the heartwatch would not disturb them at all, 26% said it would disturb them only a little, and only 4% said that wearing the heartwatch would greatly disturb them. The heartwatch was seen as even less of a disturbance in the music listening scenario, where 76% said that wearing the heartwatch would not disturb them at all, 18% said it would disturb them only a little, and no respondents said that wearing the heartwatch would greatly disturb them. With 78% of the subjects reporting that wearing the heartwatch would disturb them only a little or not at all while performing, based upon one experience with the heartwatch, we concluded that the heartwatch would probably be well received by subjects using it in music research.

In the case of music listening, 94% of the subjects reported that wearing the heartwatch would disturb them only a little or not at all. Whether the use of the heartwatch involved performance or listening, we believe that subject concerns would greatly diminish as the subjects acquired more experience with the heartwatch.

Heartwatch Limitations

During the preliminary phase of our study, we dealt with the question of the ambient temperature in the place where the heartwatch is stored. Normally, the heartwatch would be stored at room temperature, but it might encounter stressfully hot or cold temperatures while being transported to a research site or being locked in an automobile for safekeeping. The manufacturer states in the specifications (p. 19, manual) that the instrument will operate in temperatures between 23 and 113 degrees Fahrenheit (F).

We tested the instrument after storing it for several hours previous to the test in ambient temperatures which ranged from 15 to 100 degrees F. This test was not an unrealistic one because in every case the instrument was being kept in a locked automobile for safekeeping prior to it scheduled use.

Only the coldest temperatures caused a problem. We found that our heartwatches would not give heart rate readouts after being stored for several hours at temperatures colder than 35 degrees F. We assumed that the problem was in the transmitter and was probably its battery, because the unit would begin to function after the transmitter had been warmed by being strapped to

the body in preparation for a measurement session. The colder the transmitter was allowed to become, the longer time it needed to warm to a temperature at which it would function. On one occasion when it had been kept at 20 degrees F, it required one half hour to become fully functional. It is probable that the sensitivity to cold is also influenced by the age and condition of the batteries. A lengthy unforeseen warmup period could be disrupting to a research study, so we recommend that the heartwatch always be kept at normal room temperature prior to its use.

We investigated the necessity of wetting the contact strips on the electrode strap before putting the strap on. The manufacturer's instructions (p. 7, manual) call for placing water on the electrode strips just before putting on the watch. We were concerned that subjects might use saliva instead of water if they did not have water available in their dressing room, and we wanted to learn if the instrument would work equally well without wetting the electrode strips.

We found that "dry" electrode strips would always work eventually, but that the way they worked was by becoming wet from the subject's eventual perspiration. Subjects will always perspire under the electrode strips because the strips are made of a rubbery material which does not permit moisture to pass through. In cool, dry weather, some subjects required fifteen minutes to perspire enough to wet the electrode strips. We recommend that a supply of clean water be placed in the dressing room to be used by the subjects. In our experience, properly wetted electrode strips always began to capture the heart's electrical signals immediately.

The amount of practical difficulty in adjusting the length of the electrode strap is largely a matter of opinion. No subjects complained specifically about adjusting the strap, but in our own use of the heartwatch we found that our first adjustment would sometimes have the opposite effect of what we had intended. We suspect that some subjects chose to work with the strap at its then-current setting rather than spend time working on an adjustment. We recommend that every subject try to adjust the strap to a length appropriate for his or her body. A strap that is too loose will give zero or inaccurate readings, while a strap that is too tight will cause discomfort for the subject.

We wanted to learn if the standard electrode strap had a wide enough range of length adjustment to permit its use with children. We did not work with subjects younger than 18 in this study, so we took the electrode strap to a professional seamstress who specialized in children's clothing. She stated that it would be easy to adapt the standard electrode strap for use by children, and that it would also be easy to replace the strap's elastic when this was needed because of wear and aging.

At the beginning of this study we had hoped to determine the acceptable range of tightness of the electrode strap which would still allow transmission of a reliable signal. The only practical way of measuring the strap's tightness was to measure the width of the gap between the two ends of the strap when it was placed at the correct height on the chest without stretching the belt (p., manual). The amount of tightness actually obtained using the recommended gap of six inches would be a function of the age and condition of the elastic on the strap, and we decided that it would do no good for us to investigate this because of the considerable variation that might be

found with straps of different ages and histories of use. The heartwatch will respond with zero readings of heart rate when electrical contact with the body is broken, and a lack of zero readings suggests that the strap is adequately tight. Users should note that zero readings can also be caused by moving the receiver too far away from the transmitter.

We had hoped to determine how high and how low on the chest the electrode strap might be worn and still generate a reliable signal. It is helpful to first define the optimum location on the chest for placing the electrode strap. The manufacturer's instructions (p. 7, manual) say to locate the strap "just below the breasts" and they show a male wearer with the strap worn at the level that we judged to be approximately three inches below the nipples.

We consulted a respected textbook on physiological measurement and found illustrations which presented both the major surface landmarks of the chest and the areas of maximal signal intensity of the sound producing valves of the heart (Goldstein & Free, 1979, pp. 270, 272). It was evident that the electrode strips of the heartwatch were positioned to receive electrical information from the heart's mitral and tricuspid valves, and our job was to design a set of instructions which would consistently tell inexperienced users how to place the strap in the most optimum location.

We approached this task with both pictures and words. The most helpful body landmark was the lowest part of the sternum or breastbone, and we advised subjects to center the transmitter over this area about one inch below the nipples for males and immediately below the breasts for females. Our simplified instructions presented drawings of both male and female torso views of subjects wearing the electrode strap and transmitter at the optimum level.

With optimum placement of the electrode strap defined we were then ready to evaluate the result of departures from this placement. The typical contour of the female breast would tend to prevent female subjects from wearing the electrode strap any higher on the chest than directed, and when male subjects moved the electrode belt above the nipples the heart rate signal quickly faded. In actual practice, we found that there was a band of optimum height on the chest no more than three inches tall, centered on the lowest point of the sternum or breastbone and immediately above the xiphoid process. When the electrode strap is located here, it will pick up the most reliable signals.

We wanted to learn if the receiver would operate reliably if not worn on the wrist. In planning the study, we had foreseen that many performers would not want to wear the receiver on their wrists for reasons of aesthetics or for dislike of the comparatively large size of the receiver. As the study progressed, we also learned that the heartwatch could have an unintended biofeedback effect on performers who momentarily saw their heart rate while performing. The best way to prevent this would be to accumulate data with the receiver positioned where the subject could not see it.

It was necessary first to determine the practical limitations of the distance across which the transmitter would reliably send a signal to the receiver. For practical purposes, the manufacturer guaranteed a broadcast range of "arm's length," but we suspected that the actual range was longer than that. Working with an assistant, 31 subjects in the field trial measured the greatest distance in inches between the transmitter they were wearing and

the receiver (which was held by the assistant) before the receiver stopped displaying a heart rate and reset the heart rate to zero. The mean distance at which the signal faded was 55 inches with a standard deviation of 3 inches.

This finding suggested that it would be possible to clip the receiver to a music stand being used by the subject or place it on a piano being played by the subject. The receiver should be turned so that the subject cannot see the receiver's face. The material from which a music stand is made did not seem to be a problem for the heartwatch. We were able to transmit a signal through the solid body of a metal music stand.

Our strongest recommendation, however, is that the receiver be placed in a pocket or pinned inside a jacket worn by the performer. This would take the receiver out of view of the subject, while still minimizing the distance that the signal must be transmitted. It should be noted that the transmitter loses its transmission range as the battery wears down.

We wanted to learn if heartwatches were susceptible to measurement artifact (error) during data collection. If so, we wanted to uncover the conditions that led to artifact. We intentionally removed each of the two electrodes from the body briefly while holding the other one securely in place. The heartwatch simply maintained the current heart rate readout for a while, and reported new heart rate samples when we returned the second electrode to the body. It would even maintain the current heart rate readout for a moment if both electrodes were removed from the body. As soon as they were returned to proper contact with the body, the heartwatch responded with new heart rate samples.

If either or both electrodes were removed from the body for longer than approximately 7 seconds, the heartwatch reset its heart rate readout to zero. If electrode contact was intentionally broken for less than 5 seconds, heart rate readout was not interrupted. The most immediate indicator of ongoing heart rate sampling was the regular blinking of the large heart symbol in the lower left corner of the receiver display. As long as the symbol blinked, heart rate was being successfully sampled. We did not consider it a measurement artifact when the heartwatch reset its display to zero, but rather a warning to the user that an invalid signal had been received, or that signals had not been received during an interval when they had been reasonably expected.

We did experience two kinds of measurement artifact, however. These artifacts were isolated readings of heart rates much higher or much lower than were reasonably expected. As an example of heart rates that might be reasonably expected, most of our subjects recorded heart rates of 60 to 80 beats per minute while quietly resting before performance, and 70 to 90 beats per minute while performing music, usually with no audience. When performing vigorous exercise, subjects often attained heart rates of 130 to 160, depending upon their age and physical condition. We operationally defined it to be a measurement artifact when a heart rate abruptly changed to a value that was more than double or less than half the value of the previous and successive readings. Less than one percent of our sampled data could be considered artifact under this definition.

Despite our repeated attempts to intentionally produce an artifact, we only succeeded in doing this one time, and we did this by removing one electrode from contact with the body. Nine out of ten times when we did this,

the instrument would reset the heart rate display to zero rather than produce an artifactual reading. To combat the effect of occasional measurement artifacts, we recommend that user program the heartwatch to sample heart rate more often than is "needed" in their study. It would be safer, for example, to accumulate heart rate every 15 seconds and average it across 4 readings rather than accumulate a reading only once in 60 seconds.

We also watched for evidence of electromagnetic interference in our use of the instrument, and we observed none. The manufacturer lists televisions sets, electric motors, vehicles including airplanes, radio and television antennas, and high voltage power lines as sources of strong electromagnetic radiation (p. 16, manual). Users should avoid close proximity to these things while using the heartwatch in order to assure the most accurate readings.

The manufacturer cautions that a person using a heartwatch should not come closer than three and one half feet away from other individuals using similar equipment (p. 16, manual). There is a possibility that the receiver might report data from another person's transmitter rather than that of the user, or it might report an error because of receiving data from both transmitters. In view of our experiment on effective transmission distance, we think that users of the heartwatch should come no closer than five feet away from other users of the heartwatch. This would prevent the simultaneous measurement of all the people in a small ensemble unless they were seated at comparatively large distances from each other.

We found that our subjects were easily able to recall stored heart rate data using our simplified instructions and the manual readout procedure. Once begun, the readout progressed very rapidly, however. It is possible to interrupt the readout by pressing one of the control buttons, but we suggest that researchers either have an assistant available to write down stored data or that they read the stored data aloud into a tape recorder for transcription later. Stored data will not be erased until new data are recorded.

The manufacturer states that with two to three hours of daily use, the transmitter battery will last approximately one to two years and the receiver battery will last approximately one year. In our own use, the batteries lasted approximately two years in each unit as long as they were strong at the time of installation. One battery was not and it had to be replaced one month later.

The receiver battery is beginning to fail when the readout begins to lose its contrast. Erratic heart rate values can indicate the need for a new transmitter battery, a new electrode strap, or both. If the erratic nature of the readouts can be stopped by bringing the receiver closer to the transmitter, a failing transmitter battery should be suspected. If a new transmitter battery does not correct the erratic readout, a new electrode strap is probably needed. One subject reported that the receiver stopped displaying her heart rate when she turned slightly to the side and the receiver was no longer in front of the transmitter. We were unable to replicate this observation, and we hypothesized that it was caused by a weakening transmitter battery.

Although the manufacturer recommends going to a jeweler for battery replacement, we found that we were capable of doing the job ourselves. However, it was necessary to very carefully note the position of the old battery and quickly insert the new one in the same position. We recommend that the manufacturer add photos and instructions for doing this in any revision of the

manual, while continuing to recommend professional battery replacement for those who prefer not to do it themselves.

A far more challenging problem for heartwatch users is to simply maintain a supply of BR2325 lithium batteries in good condition. In a metropolitan area of approximately 500,000 population in the Midwestern United States, we were able to find this battery at the heartwatch dealership, at a large local chain of discount stores, and in some but not all outlets of a national discount electronics store. Retail prices ranged from $5.00 per battery at the dealership to $1.69 per battery at the discount stores.

The difficulty was that none of these sources could be depended upon to quickly replace their BR2325 battery stock after selling all of the batteries they currently had. During the course of this study we bought batteries from four different stores, and on one occasion the new battery we bought was within one month of the end of its service life. For this reason we recommend that any user of the heartwatch buy a battery tester that will evaluate 3 volt button batteries, and maintain a supply of two new batteries for every heartwatch in use in the project. Computer Instruments Corporation will sell the BR2325 battery by mail at a retail price of $3.95 per battery and will arrange COD shipment for purchases of $25.00 or more.

As noted earlier, the electrode strap of the heartwatch has a finite life. One of ours failed after approximately two years, and the demands of a research project involving many different subjects will place more wear on the strap than typical use by one individual. We recommend that anyone using the heartwatch for research maintain an extra electrode strap for every heartwatch in use. The extra strap could be held in reserve, or it could be placed in use together with the original one with each adjusted to a different size. At the time of this writing, the retail price of an electrode strap is $33.00.

Conclusion

Based upon this detailed empirical assessment of the instrument, we conclude that the CIC Uniq heartwatch, Model 8799, is well suited for use in music research. We advise prospective users of the heartwatch to review our detailed findings presented above and plan their studies accordingly.

If heart rate is the dependent variable in a study, the heartwatch offers important advantages to the music researcher in comparison to more traditional physiological measurement instruments like the telemetric physiograph. Purchase price of the heartwatch is much lower than that of the physiograph, and the entire instrument and instruction manual will fit within a business envelope. The heartwatch has no bulky equipment associated with it which might intimidate subjects, and its portability and comparatively low cost make it a candidate for long term loan to subjects for purposes of longitudinal data collection. One would be reluctant to loan an instrument costing several thousand dollars to a research subject, and most music research budgets could not afford more than one unit of an instrument costing so much.

The heartwatch has an excellent verification characteristic, in which the subject or the researcher can tell at a glance whether or not the heartwatch is currently measuring heart rate. If it is measuring heart rate, the heartwatch is correctly installed. If it is not, something needs to be checked.

Our subjects enjoyed the feeling that they had control of the

heartwatch, and they were happy to assume responsibility that data were actually being collected. This perception of "user-friendliness" will probably serve as an incentive for subjects to volunteer to participate in future heartwatch studies. We believe the heartwatch would be well received by subjects from middle school through college level.

When we spoke to a representative of Computer Instrument Corporation during preparation of this report, we were told that the Uniq Heartwatch, Model 8799, had been discontinued. It was replaced by a new model from the same manufacturer, Polar Electro. The new Polar Vantage XL is also distributed by Computer Instrument Corporation at a retail price of $369.00 per unit. A new type of computer interface has been designed, priced at $499.00 retail including connecting cable and software.

We purchased two new Polar Vantage XL heartwatches together with an interface and software for an IBM format microcomputer, intending to use them in future studies of music performance anxiety. We immediately began to test the new units to compare them to the CIC Uniq heartwatch.

The Polar Vantage XL is quite similar in physical appearance to the Uniq Heartwatch. The contact strips on the electrode strap are larger, and they now have a slightly grooved texture that should help them to retain water put there to improve electrical contact with the body. The receiver unit is considerably smaller, and its control buttons have been redesigned and relocated. The face of the receiver is still large enough to permit easy readout of its content. The entire unit is packaged in a rigid plastic box with ventilation slots for the electrode strap.

The instruction manual for the Polar Vantage XL is completely new. Clear drawings are used in place of the old photographs. There is a section on trouble shooting, and there are detailed and well illustrated instructions for changing the battery in both the transmitter and the receiver. Warranty is still for one year, and the same lithium battery (BR2325) is used in the new unit.

The Polar Vantage XL performs all functions of the Uniq Heartwatch, and incorporates a few additional ones. Data accumulation capacity has been greatly expanded, and it is easier to use the available storage because the Vantage XL can define eight data files in storage compared to the Uniq Heartwatch's one. This means, for example, that eight subjects could be tested with the Vantage XL before it would be necessary to upload or read out the data.

In preliminary testing, we found that the Polar Vantage XL delivered an essentially identical performance as that of the CIC Uniq Heartwatch. The instruction manual which came with the unit was even more complex than its predecessor, because of the added capabilities and the redesign of the control functions on the receiver. We would want to prepare our own simplified instructions before using the unit in research. We believe that the capability of creating up to eight data files in one testing session makes the Polar Vantage XL a significantly better research instrument than the CIC Uniq Heartwatch.

We found the optional computer interface easy to use, and there were no problems caused by loss or corruption of data. However, the software that accompanies the interface was designed for physical fitness evaluation and the monitoring of exercise programs. It was not designed to facilitate statistical analysis, and it does not compute the mean and standard deviation of each measurement session. It was necessary to reformat the data in order to use

our own statistical software to perform an analysis, and this necessity considerably reduced the usefulness of the computer interface.

Two music researchers, Melissa Brotons and Philip Tartalone, completed doctoral dissertations using the Polar Vantage XL in studies of music performance anxiety. We interviewed both researchers, and they expressed satisfaction with the Polar Vantage XL as a measuring instrument. We intend to retain both our CIC Uniq Heartwatches and our Polar Vantage XLs for use in our own research projects. We will use the CIC Uniq Heartwatch in projects where simplicity of operation is important, and we will use the Polar Vantage XL in projects where its large data capacity will be helpful. We recommend the Polar Vantage XL for researchers who are purchasing new heart rate measuring equipment at this time.

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RELATIONSHIPS AMONG SELECTED DIRECTOR CHARACTERISTICS AND SECONDARY CHORAL DIRECTORS' USE OF NON-ENGLISH TEXTS

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This study was designed to investigate the use of non-English texts in Kansas secondary choral programs. Additional components of the study included factors which may influence the use of non-English texts, transliteration systems used to teach diction, origin of choral directors' diction knowledge, and diction resources used by directors.

Choral directors ($N=379$) from all high schools in the State of Kansas were surveyed, and 57% ($N=216$) returned usable questionnaires. Respondents reported undergraduate concentrations in applied areas as follows: Voice (59%), keyboard (27%), and other instruments (27%). Sixty-six percent of the respondents had baccalaureate degrees and 34% had graduate degrees. Twenty-five percent had three years or less of experience and 75% had four years or more of experience. Directors reported membership in choral-singing organizations (47%), music organizations other than choral/singing ones (36%), and no professional music organization (17%).

English texts were found in 82% of the total choral selections reported as rehearsed and/or performed. Latin texts were used in 11% of the selections while other languages included German (2%), Italian (1-2%), French (1%), and Spanish. Over 15% of the respondents selected only English texts for their choirs.

Results indicated that those who have taken a college diction class, whose applied concentration was voice, or who belong to professional choral-singing organizations use significantly more non-English texts with their choirs, are more comfortable with non-English texts, and are more likely to use the International Phonetic Alphabet (IPA). In addition, those with graduate degrees are more comfortable with non-English texts, and those with more secondary directing experience use more non-English texts.

Future research is suggested to examine the relationship between school size, choral program size, or population characteristics and use of non-English texts. Future studies should investigate why the IPA is not used more extensively, and what resources are preferred by college instructors of diction courses. These and other studies may stimulate discussion among choral music publishers to provide pronunciation guides for non-English texts in printed scores.

CLAUDE THOMAS SMITH: AMERICAN COMPOSER, CONDUCTOR, AND MUSIC EDUCATOR

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Claude Thomas Smith (1932-1987), nationally and internationally recognized as an outstanding composer, clinician, conductor, and music educator, was a native of Carrollton, Missouri. After completing two years of education at Central Methodist College, Smith enlisted in the United States Army and was assigned to the 371st Army Band in Fort Leavenworth, Kansas. It was during his three years in the 371st Army Band that Smith began to arrange and compose music. Following his military service, Smith completed a Bachelor of Music Education degree at the University of Kansas in Lawrence.

In 1958 Smith began a distinguished twenty-year career in music education which included high school teaching positions in Cozad, Nebraska; Kansas City, Missouri; and Chillicothe, Missouri. He taught at the university level for two years at Southwest Missouri State University in Springfield. The last nine years of Smith's life were devoted to composition and to his work as a clinician and conductor.

Smith's numerous compositions encompass the mediums of choral and instrumental music, particularly band music, and range in difficulty from an elementary level to a professional level. His commissions include works for renowned soloists and many of the nation's foremost military bands.

The purpose of the dissertation is to provide a comprehensive biography of the life of Smith and to document and record his many accomplishments. Many of Smith's activities are recorded in newspapers and periodicals, but only a limited number of studies have been completed which reflect the growing popularity of his compositions and his influence upon music composition itself. Numerous interviews of his students and colleagues, of prominent musicians, of the general public, and of his family for this study provide insight into Smith's acceptance and prestige during his lifetime. The appendices include a complete catalogue of his published and unpublished compositions and selected programs and photographs.

THE EFFECTS OF VOCAL MODELING AND MELODIC DIRECTION ON DEVELOPMENT OF HEAD VOICE PLACEMENT IN 4-YEAR-OLD, NONSINGING CHILDREN

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The purpose of this study was to investigate the effect of three variables on incidence of head voice singing in 4-year-old children: gender of subjects, voice placement of model, and ascending versus descending melodic line. Judges rated children as being in head voice (3), middle voice (2), chest voice (1), or nonsinging (0) level.

Eighty-seven 4-year-old nonsingers selected from eight daycare centers in a midwest, metropolitan city were randomly divided into two treatment groups. The head voice treatment group ($n = 45$) included 21 boys and 24 girls; the chest voice treatment group ($n = 42$) included 20 boys and 22 girls. Groups were subdivided into two treatment plans with training materials utilizing predominantly ascending or descending melodic patterns. Within each treatment group, gender was considered an independent variable. Two music educators, using detailed lesson plans administered 10 training sessions of 15 minutes each extending over a period of one month. Following these sessions, subjects were tested over two songs they had learned during training.

Five judges who had received special training in identification of child head voice quality, child middle voice quality, and child chest voice quality rated 174 singing responses for voice quality (3 = head, 2 = middle, 1 = chest, 0 = spoken response). The results of the analysis showed that the number of subjects who sang in head voice placement after exposure to a head voice model were significantly higher than the number of subjects who sang in head voice placement after exposure to a chest voice model, $X^2(2, N = 87) = 30.90$, $p < .05$ for Song 1, and $X^2(2, N = 87) = 16.82$, $p < .05$ for Song 2. No significant difference was found related to gender or melodic direction with a head voice model. With a chest voice model, there was a significant difference, $X^2(2, N = 42) = 9.44$, $p < .05$ in favor of ascending melodic patterns in Song 2.

A STRATEGY FOR INCORPORATING CRITICAL THINKING INTO THE CONDUCTING CURRICULUM

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The primary purpose of this research was to develop an instructional tool whereby deliberate incorporation of critical thinking activities into the conducting classroom can be achieved. This study was also designed to provide descriptive data examining whether the use of critical thinking techniques would be feasible and beneficial to the development of undergraduate conductors.

A feasibility study was undertaken to field test critical thinking materials in the laboratory sections of a basic conducting class. One group ($n = 5$) participated in critical thinking activities. While no significant differences were found between the cumulative conducting skill scores of the two groups, an Attitude Survey revealed that the critical thinking activities appeared to stimulate critical thinking on the part of the treatment group, which also indicated higher self-confidence levels by self-report than did the control group. A notable observation is that the deliberate infusion of critical thinking activities into the course did not hinder the skill development of the beginning undergraduate conductors in the treatment group. It is also important to note that the Attitude Survey indicated that individual attention had a positive effect on the attitudes and skill improvement of both groups of beginning conductors.

For the proposes of this study, critical thinking as it relates to the teaching of conducting was operationally defined to include the following components:

> The conductor who thinks critically will be able to recognize and modify ineffective conducting gestures, have a continually developing repertoire of rehearsal techniques, be able to make rehearsal pacing judgments based upon the needs/attention of the ensemble and requirements of the music, and make informed decisions regarding musical interpretation which will be communicated with an appropriate physical gesture.

The proposed curriculum strategy was generated in an attempt to provide the means for developing conductors who meet the criteria established by the operational definition.

A Curriculum Proposal and a Conductor's Critical Thinking Workbook were developed in an attempt to describe various methods whereby critical thinking could, in a conscious and deliberate fashion, be incorporated into the traditional conducting curriculum. Critical thinking exercises included in the workbook were sequenced and categorized according to the thinking operations suggested by Louis E. Raths, as well as the basic physical skill categories common to most conducting textbooks. The Workbook's design is such that it can be adapted for use by each individual instructor, regardless of textbook

being utilized. It is also structured in such a way that it can be used with flexibility in or out of the formal classroom setting.

The function of the Workbook is to provide a graduated sequence of activities that involve both psychomotor skills and critical thinking exercises. It is intended that by using this Workbook as a regular part of instruction the conducting students not only will improve their psychomotor skills, but will begin to draw connections between the various musical elements that contribute to their becoming effective conductors.

The Workbook is divided into five sections in an attempt to address both psychomotor skills and critical thinking activities as follows:

I. Time Beating
II. Cues and Expression
III. Score Study
IV. Rehearsal Technique
V. Interpretation & Style

The following list, while not conclusive, will indicate the variety of thinking-related operations which are utilized in the Critical Thinking Workbook.

Observing	Comparing	Summarizing
Classifying	Interpreting	Looking for Assumptions
Hypothesizing	Criticizing	Predicting/Imagining
Applying	Evaluating	Creating

The underlying philosophy for the entire sequence, approach, and use of the Conductor's Critical Thinking Workbook is that of building a foundation and "ground of experience" that will facilitate independent and critical thinking on the part of undergraduate conductors. It is hoped that in laying this primary foundation conductor skill and effectiveness not only will improve, but young conductors will have ready access to the cognitive tools necessary to attempt to solve more challenging conducting problems as they are encountered.

What emerges through a review of the literature is that the ability to think critically is an assumed characteristic of the effective conductor. By this study's operational definition, the conductor who thinks critically will be able to recognize and modify ineffective conducting gestures, have a continually developing repertoire of rehearsal techniques, make rehearsal pacing judgments based upon the needs/attention of the ensemble and requirements of the music, and make informed decisions regarding musical interpretation that will be communicated with an appropriate physical gesture. If these goals are to be achieved, it becomes imperative that teachers of conducting begin to address deliberately the cognitive aspects of conducting as aggressively as they traditionally have emphasized psychomotor development.

THE INFLUENCE OF ISOLATED RHYTHMIC TRAINING WITH A SELECTED METHOD OF STUDY ON THE ABILITY TO SING MUSIC AT SIGHT

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The purpose of the present study was to determine whether students who received rhythmic training would show greater achievement in sight reading skill than similar students who did not receive that training. In addition, the study determined if there would be a statistically significant interaction of gender, major, or band experience with students who received rhythmic training and similar students who did not receive that training. The program of training utilized the rhythm skill sheets of Thostenson (1967).

Ninety-two students enrolled in Concert Choir at Western Illinois University were subjects for the experiment. The subjects were placed into two similar groups: (a) the control group ($N=48$) and (b) the experimental group ($N=44$). The melodic portion of Thostenson's (1967) Criterion Sight Singing Test 76 (CSST76) was administered as a pretest and posttest for all subjects.

Concert Choir met for three fifty-minute rehearsals a week. For a period of seven weeks, the control group was dismissed from the last seven minutes of each rehearsal. The experimental group continued the rehearsal utilizing Thostenson's (1967) program of rhythm training. After the posttest was administered, the experimental treatment was reversed with the control group receiving the rhythm training for the remainder of the semester. Neither group was cognizant of being the experimental or control group.

An analysis of covariance (ANCOVA) which adjusts posttest scores for pretest scores by a regression procedure was used to determine the effectiveness of the program of rhythmic training on sight reading ability. For method, the ANCOVA summary showed a statistically significant difference, $F=5.244(1, 91)$, $p=.025$. The experimental group achieved the highest mean score. From this finding, it was concluded that the program of rhythmic training did improve the ability to sight read and that a transfer of rhythm reading to sight reading did take place. For method related to gender, the ANCOVA summary also showed a statistically significant difference, $F=4.28(1, 91)$, $p=.042$. The difference in score was in favor of the males with training. Therefore, males who received rhythmic training showed the greatest achievement in sight reading skill. No statistically significant difference was found for method related to major or band experience.

THE EFFECT OF MULTICULTURAL DANCE ON FIFTH GRADE STUDENTS' ATTITUDES AND ACQUISITION OF MUSICAL CONCEPTS

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The purpose of this study was to determine the effects of multicultural folk dance on fifth grade students' acquisition of music concepts and attitudes. Research suggests a close relationship between motor activity and mental activity, such that movement facilitates and enhances conceptual learning. Thus, emphasis on active learning experiences enhances the learning environment. Even though the Music Educators National Conference and other professional organizations are proponents of music teaching from a multicultural perspective, the effects of multicultural education, through activities such as folk dance, on student learning and attitude remain largely unexamined.

Four groups were formed (multicultural dance, unrelated movement, no movement, and control [no movement/no multicultural studies]) for comparisons in this study. Four hypotheses were constructed to guide investigation of the difference between groups regarding acquisition of knowledge concepts and attitude. Conceptual knowledge and attitude inventory posttest data were examined. Multicultural instruction, which included folk dance, produced statistically significant ($p<.01$) increases in instrumental, musical, and cultural knowledge concept scores when compared to other multicultural groups (unrelated movement and no movement) and a control group. Attitude difference between movement groups and non-movement groups was statistically significant ($p<.01$). The unrelated movement and folk dance group scored higher than no movement and control groups in attitude toward specific multicultural music selections, multicultural music in general, and multicultural folk dance. There was no statistically significant difference between the unrelated movement and folk dance group for these variables.

THE EFFECT OF PITCH MATCHING STRATEGIES ON THE PITCH MATCHING ABILITIES AND ATTITUDES OF MIDDLE SCHOOL SINGERS

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Research detailing middle school singers, changing voices, attitudes, pitch matching, and pitch matching assessment provided a basis for this study which sought to determine the effect of pitch matching strategies on pitch matching accuracy and attitudes of middle school students. Subjects were sixth, seventh, and eighth grade students ($N = 207$) from a suburban middle school divided into two treatment groups and one control group. Changes in pretest to posttest pitch matching abilities and attitudes were examined.

Subjects ($N = 207$) participated in Pitchmaster or Individual Help treatments. A Control group was utilized. Significant differences in pretest-posttest comparisons were not found to be a function of treatment condition. All groups showed a significant improvement in pretest to posttest pitch matching abilities. A significantly positive progression of pretest to posttest attitude scores was found in the Individual Help and Control groups. There was a significant difference between the posttest attitude scores of the good and poor pitch matchers, with the good pitch matcher exhibiting more positive attitudes. There was no significant difference found in the achievement of students in the treatment methods used in this study. It was determined that positive musical experiences and/or vocal maturation could have affected the refinement of the abilities and attitudes.

THE EFFECT OF SEQUENTIAL AND SPACED-DAYS SCHEDULING OF ELEMENTARY MUSIC INSTRUCTION ON LEARNING FOR TWO SELECTED SKILLS

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Music educators agree that learning is a primary goal. Research has not investigated the relationship between instructional schedules of elementary classroom music and student achievement.

The purpose of this study was to compare the effectiveness of sequential (Monday/Tuesday) and spaced-days (Tuesday/Thursday) schedules regarding learning for cognitive and kinesthetic skills. A prerequisite purpose was to determine the amount of learning occurring within either schedule. The subjects ($N = 39$) were members of two intact fourth-grade classes at a public elementary school in a suburban midwest city.

This study provided for instruction and testing of cognitive skills (five class periods) and kinesthetic skills (three class periods). The cognitive topics included treble clef notes, rhythm symbols, time signatures, and counting notation. The soprano recorder was the musical instrument used in the kinesthetic portion of the study. A pretest was administered on the first day of each unit and a posttest on the last day of each unit. The posttest was given on the first day of the regular weekly music schedule. The school's music specialist (who was also the experimenter) administered the study and evaluated the tests. A variety of teaching tools were used in the lesson plans: written exercise drills, overhead projector transparencies, and chalkboard drills.

Results of the study showed: (a) there was no statistically significant difference in the Class A (sequential days) and Class B (spaced days) posttest cognitive scores ($t = .12$, $p = .908$); (b) there was no statistically significant difference in the Class A and Class B posttest kinesthetic scores ($t = .20$, $p = .843$); (c) there was a statistically significant difference in the pretest and posttest cognitive scores of Class A ($t = 3.86$, $p < .001$); (d) there was a statistically significant difference in the pretest and posttest cognitive scores of Class B ($t = 5.56$, $p < .001$); (e) there was a statistically significant difference in the pretest and posttest kinesthetic scores of Class A ($t = 13.92$, $p < .001$); (f) there was a statistically significant difference in the pretest and posttest kinesthetic scores of Class B ($t = 29.96$, $p < .001$).

The hypotheses and their results indicate that learning was taking place over time. Learning of the two selected skills, however, was not significantly influenced by the instructional schedules used in this study.

GRADING APPROACHES FOR MUSIC PERFORMANCE CLASSES: A SAMPLE SYSTEM FOR HIGH SCHOOL CHOIR

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The purpose of this study was to design a sample grading system for high school choir. Problems specific to grading music performance groups were investigated. Related literature was reviewed to find sample grading systems and suggested guidelines for setting grading systems. Using that information, a sample grading system was devised. Evaluation sheets to assess capabilities were also constructed.

INSTRUCTIONS TO CONTRIBUTORS

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