The Effect of Small versus Large Group Learning on Music Reading Accuracy in the Choral Classroom

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The purpose of this study was to compare the impact of two different modes of instruction (large group and small group learning) on the music reading accuracy of high school choir singers. Participants \( n = 63 \) included members of intermediate and advanced level women’s choirs who varied in age, ethnicity, experience, and level of proficiency. For treatment A, large group learning, participants sight read sixteen measures of a piece of music in a large group formation with teacher-led instruction. For treatment B, the participants followed the same procedure with new music in small group formations with student-led instruction. Students were recorded individually while singing within concert formation at the conclusion of each treatment. Results showed significantly higher mean scores for treatment B, small group learning, than for treatment A, large group learning, indicating that small group learning may be a more effective means of improving music reading accuracy.
The Effect of Small versus Large Group Learning on Music Reading Accuracy in the Choral Classroom

by

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A Thesis

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CHAPTER ONE

Introduction

Choral directors employ a variety of teaching methods to facilitate music reading within their choirs. Some teach sight singing as an entirely separate concept from learning repertoire, while others manage to integrate the two, despite the fact that the music reading ability of choral students is usually far below the level required for the repertoire they sing (Demorest & May, 1995). Continuing research into successful music reading strategies that can be applied to both sight singing as a skill and the reading of repertoire will hopefully aid in narrowing this discrepancy.

Research thus far has suggested that certain strategies and factors are indicative of greater music reading achievement. The majority of these studies deal with music reading in regard to sight-singing skill as an isolated concept. Boyle and Lucas (1990) tested thirty undergraduate music students to determine sight-singing skill level. Students were tested on tonal melodies with and without harmonic accompaniment. Scores were significantly higher for sight singing within a tonal harmonic context than without it, especially for beginning college level sight-singers. Results also indicated that dependence on harmonic accompaniment decreased as sight-singing skill level increased. Lucas (1994) later tested middle school choral students’ sight-singing skill with regard to harmonic context. Contexts used included melody alone, piano harmonic context, and vocal harmonic context. These students obtained the highest scores when tested in a melody only context, which seems to contradict with the earlier findings of Boyle and Lucas.
Henry and Demorest (1994) tested individual choir members from two Texas high school choirs with a history of group sight singing success. Singers from these outstanding choirs achieved a mean sight-singing score of 66% on basic pitch and rhythm skills, which was far below the success rate of the group. No significant difference was found between those who used *moveable do* and those who used a *fixed do* system of sight singing. Background variables were also compared to the skill level of individual choir members. Private piano study was the only variable that showed a significant relationship to individual sight-singing success. Demorest and May (1995) also examined individual sight-singing skill of students from similar choirs in relation to background variables. Two different melodies, one more difficult than the other, were used to determine if a non-diatonic pitch included in a melody significantly lowers individual sight-singing scores. Results showed that scores for Melody A were significantly higher than scores for the more difficult Melody B. Years of school choir experience was the strongest significant predictor of individual sight-singing success, followed by years of private piano, instrumental, and vocal study.

Henry (2004) researched the use of specific pitch skills emphasizing scale degree and harmonic function for sight-singing instruction. Two treatment groups received twelve weeks of group instruction, one with unfamiliar melodies incorporating the targeted pitch skills, and one with familiar melodies incorporating the same targeted pitch skills. Unlike previous research, these skills were also emphasized within the context of the repertoire taught to both groups. Both groups achieved significantly higher mean scores on the posttest than the pretest, with no significant difference between the two. This suggests that targeting pitch skills in both familiar and unfamiliar melodies could be
an effective tool for sight-singing instruction. Killian and Henry (2005) examined strategies used by high-scoring students during individual sight-singing assessment. Evidence suggested that high scorers tonicized, used hand signs, sang out loud during practice, physically kept the beat, and finished practicing the melody within the allotted thirty seconds significantly more frequently than low-scoring students. High scorers also avoided certain behaviors, including abandoning the steady beat, stopping during the melody, not finishing, taking eyes off the music, and shifting their bodies.

The relationship between group success and individual achievement has been addressed by both research and pedagogy (Bennett, 1984; Brittain, 1998; Broomhead, 2001; Henry & Demorest, 1994). Bennett (1984), in a pedagogical article, suggested ways in which students may appear to be sight singing as individuals within a group, when in reality they are not. These include the use of imitation, tonal memory, and response to gesture. Brittain (1998), in a review of literature on the subject of sight-singing pedagogy, determined that more research needs to be conducted regarding Bennett’s idea of imitation and the individual musician in relation to the group. Henry and Demorest (1994) found that individuals do not necessarily need to be able to sight sing well for the group as a whole to be successful. Broomhead (2001) endeavored to examine the relationships between individual expressive achievement and expressive achievement of that individual’s choral ensemble, the individual’s technical performance, and the individual’s musical background. Results showed no significant relationship between individual and ensemble expressive achievement. A correlation analysis showed technical and expressive performance to be strongly related. Musical background factors that were significantly related to individual expressive achievement were involvement in
outside performing groups, semesters of high school choir, private vocal lessons, and age of first private lessons. Broomhead’s results suggest that “an ensembles ability to perform expressively may not be an accurate indicator of individual expressive achievement” (p. 81).

For studies that compared individual success to group success, researchers have individually recorded members of choral ensembles while singing within the context of the larger group. Ekholm (2000) individually recorded individuals within a choir to determine the effect of seating arrangement on how well they sang or used their voices. Participants were judged by twelve expert voice teachers. The choir as a whole was also recorded and judged by choral conductors and evaluated by the performers themselves. An earlier study recorded a choir as a whole to assess preferences and perceptions of members of an intact choir and randomly selected auditors in regard to the choral sound of the choir in a variety of spacings and formations (Daugherty, 1999).

The process of recording students individually has been used to determine pitch accuracy in relation to certain variables. Mizener (1993) recorded elementary music students to assess level of singing skill after having them fill out a questionnaire to determine if a correlation exists between skill level and attitude toward singing. Benson, Bowers, and Yarbrough (1992) individually recorded students to determine the effect of vibrato of the model voice on their pitch-matching accuracy. Henry (2004) individually recorded students singing a sight-singing line to determine the effect of a particular teaching strategy on individual sight-singing achievement.

Research dealing with sight-singing achievement or music reading ability usually tests the ability of individuals due to the fact that scoring of individuals is deemed more
accurate and informative than scoring a collective group. Interestingly, at contests and in competition, choirs are generally measured for success as a group and not as individuals. Individual competitions that do occur are usually considered optional, personal choice events mainly focusing on quality of performance as opposed to skill.

While little research has been conducted regarding the success of individuals within the context of large group learning in music, the general education community, on the other hand, is held accountable almost entirely through individual achievement on standardized tests. As a result, a great deal of study and research has been conducted as to the best way to ensure individual success while learning within the context of a large group. Possibly the most researched and written about teaching strategies that attempt to solve this dilemma are cooperative and collaborative learning.

Extensive cooperative learning research has shown this method to be effective in reaching both its academic and social goals in many different subject areas including math (Johnson & Johnson, 1989; Johnson & Johnson 1999; Siegel, 2005; Slavin, 1995). The fundamental concept of cooperative learning is to break a class into smaller groups of four to six members. Each member has a job or a role to perform within the group. Goals for each group are both social and academic. Members are assessed based on both group and individual performance. Different methods of interaction and learning such as Jigsaw or Teams Games Tournaments exist under the umbrella of cooperative learning (Slavin, 1995). Kaplan and Stauffer (1994) gave a detailed description of cooperative learning techniques and how they can be applied to music education. Kassner (2002) also advocated the use of cooperative learning in music more for reasons of social development and intrinsic motivation to learn rather than for musical achievement.
Boburka and Smialek (2006) provide some of the only research conducted on the impact of the application of cooperative learning to music on achievement. They took non-music majors in a college music appreciation class and divided them into cooperative learning groups to participate in listening exercises. Their findings suggest that cooperative learning significantly increased students’ “ability to perceive the elements of music” more so than the lecture method (p. 69).

In his definitive work on collaborative learning, Bruffee (1999) explained that the purpose of collaborative learning groups is to aid in the transition into becoming members of a new knowledge community. Each member brings a diversity of knowledge and experience that is shared with other members through the pursuit of a common academic goal. Although these ideas sound similar to cooperative learning, individual roles are not as clearly defined. Moreover, specific learning strategies are not assigned. Bruffee emphasized the fact that collaborative learning is mostly to be used in higher education due to this lack of defined structure. Each member of the group must already possess the intrinsic motivation to succeed. In a review of literature on the use of collaborative learning in music education, Luce (2001) stressed the fact that there is a difference between collaborative and cooperative learning. Upon finding only three articles on collaborative learning as applied to music education, Luce concluded that this idea is not used or written about enough in music education. Conkling (2000) described ways in which collaborative learning has already been and could be used in choral ensembles at the high school, collegiate, and adult community levels. She also acknowledged the time and effort it would take on the part of the teacher or conductor to
institute this method of learning, but suggested that the gains in knowledge and confidence would outweigh the hassle.

A basic ingredient of cooperative and collaborative learning is the division of a larger group or community into much smaller groups. This ingredient exists in many similar solutions for increasing individual achievement in schools, classrooms, and even the work place. In order for most individuals to have greater success, individual attention is required. Smaller groups working together to achieve a common goal allow for individuals to receive that individual attention from peers and colleagues that they could not possibly receive from the teacher or supervisor due to time constraints. In a choral ensemble, smaller groups already exist within the larger structure. Most notably, a choir can be divided into voice-part sections. With the exception of chamber groups, however, the voice-part sections of most choirs have a greater number of people than would allow for individual attention. Cooperative and collaborative learning strategists define this number as four to six people (Bruffee, 1999; Johnson & Johnson, 1989; Kaplan & Stauffer, 1994; Slavin, 1995).

Several recommendations have been made as to ways to further divide a choral ensemble to better promote individual achievement. Regarding choral music teaching styles, Gumm (1993) identified dividing a choral ensemble into smaller groups to learn and rehearse music as one of ten valid teaching styles. Beckman-Collier (2003) advocated the use of quartets. Members would consist of one person from each voice part in a four-part mixed ensemble working together to learn repertoire. Bennett (1984) advocated dividing voice-part sections into smaller groups for sight-singing to enhance individual sight-singing development. Despite these observations and pedagogical
suggestions, little research has been conducted regarding the effect of small group learning on components of choral learning including individual music reading accuracy.

The purpose of the present study is to compare two different modes of instruction (large group and small group learning) and their impact on the music reading accuracy of female high school choir members. The following questions will be investigated:

1.) What is the success rate of individuals placed in a small group environment with regard to music reading accuracy? 2.) What is the success rate of individuals placed in a large group environment with regard to music reading accuracy? 3.) Is there any significant difference between the two treatment conditions for the overall population? 4.) Are there any relationships between the instructional strategies used for the two treatment conditions and low or high scoring participants?
CHAPTER TWO
Method and Materials

Method

Participants

The participants \((n=63)\) were members of intermediate and advanced level high school women’s choirs from a 4A high school in Texas. Participants included those students who were present on the first day of data collection. Ensemble members varied in age, ethnicity, experience, and level of proficiency. Each participant participated in both treatments. Two participants of the original 65 did not complete the study due to a technical difficulty with the recording equipment.

Procedure for Treatment A

For treatment A, large group learning, ensemble members stood on the risers within their voice-part sections place assigned to them by their director. The director taught parallel portions of two three-part women’s selections. The selections were both sixteen measures in length, and included similar tasks as determined by their inclusion in the Texas University Interscholastic League Sightreading Contest. The director followed a modified version of the procedure used in the UIL contest. In order to increase the applicability of this study, the procedure was modified to more closely resemble the first reading of new literature in a rehearsal. Using a moveable-do system for sight reading, the director led the large group in chanting the pitches of the song. The director then spent two minutes correcting mistakes and having the girls chant through the measures in
which the mistakes occurred. The director then established the tonic chord and gave each section their starting pitch. The ensemble as a large group sang the selection through once. The director then verbally addressed mistakes. The choir sang the selection for a second time. Without any further instruction from the director, participants performed the selection for the recording. Approximately half of the participants (16-17) were recorded individually at one time standing on the first row. The rest of the ensemble stood directly behind them on the risers and sang. Without any further instruction from the director, the other half of the participants stood on the first row to perform the selection for the recording.

The director followed the same exact procedure for the second selection. However, to counterbalance the extra performance for one group, the group that was previously recorded first was recorded second. The same materials were used and the same procedure was followed for both ensembles.

*Procedure for Treatment B*

Treatment B, small group learning, occurred two days later using the same participants. For treatment B, all ensemble members were divided into small groups of five or six people. The small groups stood in tight circles, facing inward, in assigned places spread out across the risers. The small groups consisted of participants who all sang the same part. The same procedure for treatment A was followed, with the following differences. After the initial chanting through of the selection, the participants spent two minutes correcting mistakes within their small groups without instruction from the director. The first singing of the selection took place within the small groups as well. The ensemble was given the tonic chord and starting pitches. The small groups then
proceeded to sing the selection once through at their own tempo. Students were allowed to talk and verbally address mistakes. The second singing was lead by the director with the participants still standing in their small group formations. Without further instruction from the director, participants moved to the assigned large group formation for the recording. The procedure for recording was the same as treatment A. Again, to counterbalance, the procedure was duplicated with a second selection. The group that recorded first, then recorded second.

Scoring

All scoring was done from the recorded performances. Prior to the procedure, five pitch and five rhythm skills were identified within each musical selection. One point was deducted for each incorrectly performed skill, allowing for a perfect score of ten. Scores from each trial were added for a cumulative total. For interjudge reliability, a second judge scored twenty-five percent of the recorded performances, including some from each trial. These scores were employed for reliability purposes only, and yielded an $r$ of .96. The evaluators were blind to the treatment condition as well as the identity of the participants.

Materials

Recording

For each recording, eight individual voice recorders were placed on music stands directly in front of the individual students being recorded. Also, eight microphones connected through an interface to a laptop recorded individuals using the program Garage Band. The differing quality of the recording devices had no impact on determining
whether or not participants sang the correct pitch or rhythm. To help maintain confidentiality of the participants, each recording device was assigned a number. Each participant was randomly assigned a corresponding number with either an \textit{a} or a \textit{b} to indicate first or second performance. Students kept the same number and thus used the same recording device throughout both treatments. A practice recording was conducted two months prior to the actual data collection both to assess group ability level and to acclimate students to the recording equipment.

\textit{Pitch and Rhythm Skills}

As stated previously, four three-part compositions from the Texas University Interscholastic League Sightreading Contest were used for the treatments (see Appendices A and B). The difficulty level according to UIL specifications of all four pieces was 5A varsity, slightly above the ability level of the majority of the participants who were in the 4A varsity or non-varsity classification. The first sixteen measures of each piece were extracted and slightly altered so that each voice part included the chosen pitch and rhythm skills. The pitch skills included in each piece that were used for scoring included the following: a skip in the tonic chord, a skip in the dominant chord, a skip in a subdominant chord, an altered pitch, and a repeating pitch. Rhythm skills included the following: a dotted-quarter note followed by an eighth note, two eighth notes in a row, two quarter notes in a row, a dotted-half note, and a rhythm that differed from the concurrent rhythm in the other two voice parts. Pitch and rhythm skills in each voice part occurred after the first two measures of each piece and never overlapped.
CHAPTER THREE

Results

Analysis of Data

Descriptive Statistics

The first two research questions dealt with the success rate of individuals placed in a small group environment and those same individuals placed in a large group environment with regard to music reading accuracy. A matched pairs $t$ test was used to obtain descriptive statistics as well as significant difference at the .05 level. The raw scores from the two trials of each treatment were summed, making the score for each treatment worth up to 20 points. Scores for treatment A ranged from 11 to 20, with a mean of 16.43, and a standard deviation of 2.35. Scores for treatment B ranged from 14 to 20, with a mean of 18.24 and a standard deviation of 1.87. Figure 1 shows the score distribution for the total population.
As shown in the graph, only two participants performed worse on the second treatment. Eight participants who did not receive perfect scores performed the same on both treatments. Although the distribution of scores is somewhat erratic, clearly the majority of the participants performed better with treatment B (small group learning) than with treatment A (large group learning).

**Matched pairs t test**

The third research question asked whether or not significant difference existed between the two treatment groups for the total population. When compared to performance in large group learning, participant scores for small group learning were
significantly higher ($t = 8.34$, $62 \, df$, $p < .00000000002$). The final research question asked about the relationships between the instructional strategies used for the two treatment conditions and low or high scoring participants. Low scoring participants scored from 11 to 16 on treatment A. High scoring participants scored from 16 to 20 on treatment A. Matched pairs $t$ tests were used to determine significant difference between the two treatment conditions for the lower-scoring participants ($n = 31$) and also for higher scoring participants ($n = 32$). Table 1 summarizes the results of these tests. While both significant, low scoring participants showed even greater difference between the two treatment conditions than high scoring participants.

<table>
<thead>
<tr>
<th>Statistical Data</th>
<th>High Scorers</th>
<th>Low Scorers</th>
</tr>
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<tbody>
<tr>
<td>$M$-Treatment $A$</td>
<td>18.28</td>
<td>14.52</td>
</tr>
<tr>
<td>$M$-Treatment $B$</td>
<td>19.22</td>
<td>17.23</td>
</tr>
<tr>
<td>$df$</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>$SD$-Treatment $A$</td>
<td>1.35</td>
<td>1.46</td>
</tr>
<tr>
<td>$SD$-Treatment $B$</td>
<td>1.26</td>
<td>1.87</td>
</tr>
<tr>
<td>$t$</td>
<td>4.10*</td>
<td>9.10*</td>
</tr>
<tr>
<td>$p$, two-tailed</td>
<td>$p &lt; .0003$</td>
<td>$p &lt; .0000000004$</td>
</tr>
</tbody>
</table>

*$p < .05.$
Upon collection and scoring of the data, seven participants received a perfect score of 20 for both treatments. Due to the fact that perfect scores leave no room for improvement and only dilute the data, another matched pairs $t$ test was run leaving out the seven perfect scores, and using the remaining 56. The significant difference remained similar to the test run on the total sample ($t = 8.99, 55 \text{ df}, p<.000000000002$). However, the difference in means was greater. Figure 2 shows the comparison of means for the two $t$ tests.

![Mean scores from Matched pairs $t$ test for $n = 56$ and $n = 63$.](image)

*Figure 2. Mean scores from Matched pairs $t$ test for $n = 56$ and $n = 63.*
CHAPTER FOUR

Discussion and Conclusions

The significant difference in overall scores between large group learning and small group learning suggests that small group learning is a useful instructional strategy for music reading accuracy. As suggested by Henry and Demorest (1994) and Broomhead (2001), group success is not indicative of individual achievement. However, in order to improve the group, individuals from within the group must each improve. The small group learning strategy creates a learning environment that is partially student led and allows the students to receive individual attention from their peers. The large group learning strategy, which is entirely teacher led, does not provide individual attention, nor does it allow students to be actively engaged in the identification and correction of errors. Thus, small group learning seems to be a way to increase individual achievement in a large group setting.

This type of student-led yet teacher-guided small group learning is one of several new approaches to education based on Russian psychologist Lev Vygotsky’s sociocultural theory. These new approaches, less defined than cooperative learning, include both teacher-child and child-child collaboration. They stem from Vygotsky’s emphasis on social interaction as a key ingredient to the learning process (Berk, 2007). The success of the small group learning method in this research project could conceivably be a result of the student-led structure and resulting social interaction rather than strictly the small group placement. Future research should further investigate this
theory by comparing small group teacher-led instruction to small group student-led instruction.

Limitations of this study include the fact that the large group treatment was conducted first, and the small group treatment second due to logistical considerations. It is conceivable that the improvement of scores was due to the fact that it was the second time in a relatively short period of time that the students participated in the music-reading procedure. However, this is a procedure these particular students engage in on a regular basis. At the time the study was conducted, the students had been in school and had practiced this procedure for approximately six months. Therefore, the effect on the overall scores of one treatment occurring first and the other occurring second should be minimal.

The raw data indicated a small but significant improvement in scores between the two treatments for the majority of the individuals. Although the improvement seems small, it was significant, even when the sample was divided into high and low scoring participants. This suggests that the small group instructional strategy shows promise as an effective way to improve music reading accuracy for students with various levels of skill.

The value of scoring the readings based on pitch and rhythm skills lies in the fact that every piece of music has its own idiosyncrasies, causing inherent inequalities. Furthermore, it would be extremely difficult to find multiple pieces of music in which each part within the music has the same number of notes, and the desired sections to be used between the pieces of music have the same number of notes. However, finding
music containing the same basic skills in each part is more realistic, and provides for equality in the scoring.

Although not included in the research questions, a comparison of the score distribution for the two intact choirs used for this research is worthy of examination, especially in regard to conditions surrounding the actual collection of data. Figure 3 shows a graph of the raw scores for the intermediate women’s choir, while figure 4 shows the raw scores for the advanced women’s choir.

Figure 3. Raw score distribution for the intermediate level women’s choir.

Figure 4. Raw score distribution for the advanced level women’s choir.
As suggested by the graphs, small group learning had a greater impact on the intermediate level choir as a whole than the advanced level choir. This is interesting, due to the attitudes of the participants while data was being collected. The participants in the advanced level choir were excited about the project, and showed enthusiasm on both days of data collection. The participants in the intermediate level choir, however, were not as enthusiastic. Although all voluntarily agreed to participate in the project, the members of this choir had to be coaxed into compliance on the second day of data collection. They did not enjoy the project and begrudgingly performed the tasks that were asked of them. Generally, one would assume that poor attitudes might lead to a lack of effort, which in turn might lead to lower scores on the second day. As shown by the scores in Figure 3, this is clearly not what occurred. No one in the intermediate choir earned a lower score on treatment B (small group learning). This serves to further strengthen the idea that small group learning can have a positive impact on music reading accuracy in the choral classroom. Future research on this subject should assess attitudes in order to ascertain which instructional method students prefer, or feel benefits them the most.

Learning a piece of music for the first time can only happen once. The purpose of this study was to determine if a certain instructional strategy increases the music reading accuracy of this first learning experience. Future research efforts should extend beyond the scope of this one-time experiment to determine if this small group strategy has long-term benefits for learning a piece of music. Furthermore, although diverse, the sample size was relatively small and comprised of students from the same school. Investigators in future studies should include a much larger sample size comprised of students from multiple schools. This would also allow for half of the sample to participate in small
group learning first and large group learning second, while the other half participated in large group learning first, negating the previously mentioned limitation.
APPENDIX A

Song Material for Treatment A

A Maiden Went A-Wandering

Patti DeWitt

2002
A hunter saw this maiden among the verdant flowers between. He saw this maiden fair among the verdant flowers between. He saw this maiden fair among the verdant flowers between.

S

S

A

bow'rs. Says he, "Alas, your loveliness outshines the beautiful flowers.

S

A

bow'rs. Says he, "Alas, your loveliness outshines the flowers.

A

- 2 -
How Do I Love Thee?

Rowland Blackley

Soprano I
Soprano II
Alto

I Love thee to the depth and breadth and height My
soul can reach, when feeling out of sight for the
soul can reach, when feeling out of sight for the
soul can reach, when feeling out of sight for the
soul can reach, when feeling out of sight

ends of being and ideal Grace, ideal Grace.
ends of being and ideal Grace, for the ends of being and ideal Grace,
APPENDIX B

Song Material for Treatment B

In the Merry Month of May

Tom Council

We roamed the fields and river sides when we were young and gay.

We roamed the fields and river sides when we were young and gay.

We chased the bees and pluck'd the flow'rs in the merry merry month of May.
May. Oh, yes with ev'ry changing sports, we whiled the hours away;
The skies were bright our hearts were light in the mer-ry mer-ry month of May.
Be My Love

Rowland Blackley

Come with me and be my love, And we will all the pleasures prove That...
Come with me and be my love,
Come with me and be my love.

And we will sit upon the rocks,
Seeing the shepherd feed their flocks,

we will sit on the rocks,
Seeing the shepherd feed their flocks,

we will sit Seeing the shepherd feed their flocks,
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