

Level of Achievement	Abstract (5 points)	Review of Lit. (10 points)	Method (10 points)	Results (15 points)	Discussion (15 points)	References (5 points)	APA Style (10 points)	Scholarly Writing Style (15 points)
Exemplary	Clearly presents topic and summarizes other sections. Length is no longer than 200 words. 5 points	Clearly presents research-based topic and question(s). Includes a minimum of 11 relevant, citations that contribute in some way to the study. 10 points	Describes all methods and materials with clarity and in detail, such that study is easily understood and could be replicated by others. 10 points	Results are presented in a clear and concise manner with no conclusions, personal references or information. 14-15 points	Demonstrates clear conceptual understanding through synthesis of previous sections. Provides multiple, relevant conclusions. 14-15 points	All required information is present in each citation. Minimum of 11 citations in both text and reference section of paper. 5 points	APA format is adhered to throughout the work. 10 points	Clear organization, Smooth transitions, Consistent tense, Third person writing, correct grammar and spelling throughout 14-15 points
Quality	Presents research topic and summarizes other section but lacks clarity. Or length is far above or below 200 words 4 points	Presents research-based topic and/or question(s) but lacks clarity in one of these areas. Includes less than 11 relevant, citations that contribute in some way to the study. 8-9 points	Describes methods and materials but lacks detail and/or clarity, such that study is easily understood and could be replicated by others. 8-9 points	Results are presented in a clear and concise manner with some conclusions, personal references or information. 11-13 points	Demonstrates clear conceptual understanding through synthesis of previous sections. Provides single relevant conclusion. 11-13 points	All required information is present in most citations. Minimum of 11 citations in both text and reference section of paper. 4 points	APA format is adhered to with only minimal errors. 8-9 points	Clear organization, Smooth transitions, Correct grammar and spelling with only minimal errors. 11-13 points
Adequate	Presents research topic but lacks summary of other section(s) but lacks clarity. 3 points	Minimally presents research-based topic and/or question(s). Includes only a few citations that contribute in some way to the study. 6-7 points	Describes methods and materials but vaguely and/or not in a form that is easy to follow. 6-7 points	Results presented but not clearly and concisely. Might include information that should be placed in other sections of the paper. Inclusion of raw data. 7-10 points	Demonstrates minimal conceptual understanding of method, results and research topic. 7-10 points	All citations in text are listed. References are consistently formatted. Less than 11 citations in both text and reference section of paper. 3 points	APA format is adhered to with several errors. 6-7 points	Clear organization, Smooth transitions, Correct grammar and spelling with several errors. 7-10 points
Needs Improvement	Fails to present research topic adequately or lack summary of other sections 1-2 points	Fails to present background and research question(s). Includes only a few citations that contribute in some way to the study. 1-5 points	Describes methods and materials but vaguely and/or not in a form that is easy to follow. Major pieces of information/steps not referenced or addressed at all. 1-5 points	Results not presented in narrative format. May include information that should be placed in other sections of the paper and/or include raw data. 1-5 points	Does not demonstrate conceptual understanding of method, results and research topic. Presents poor conclusion or no conclusion at all. 1-6 points	Some text information lacks citation. Some citations in text aren't listed. Formatting is inconsistent. 1-2 points	APA format is neglected throughout with many errors. 1-5 points	Clear lack of effort in organization, transitions, correct grammar and spelling throughout most of the work 1-6 points
No Effort	Section is missing completely or has severe lack of information and/or formatting. 0 points	Section is missing completely or has severe lack of information and/or formatting. 0 points	Section is missing completely or has severe lack of information and/or formatting. 0 points	Section is missing completely or has severe lack of information and/or formatting. 0 points	Section is missing completely or has severe lack of information and/or formatting. 0 points	Section is missing completely or has severe lack of information and/or formatting. 0 points	APA format is not adhered to through most or all of the work. 0 points	No apparent attempt at organization, transitions, correct grammar and spelling in the work 0 points

Turned in previous drafts with final draft (15 points): 15

TOTAL POINTS: 92

Abstract: *This study examines the comfort of singers in specific arrangements compared to their preference of best ensemble sound. The goal of this study was to find out whether or not the singer's preference of arrangement conflicts or accurately corresponds with their preference of sound as the audience would hear it. The participants used for the study were 9 members of the University of Kansas' Jewish a cappella ensemble. The ensemble was recorded singing in 3 different arrangements singing the same piece of music that was known for memory, all of which were followed by a survey where the singers rated their level of comfort.. Ensemble members then heard the recordings in a random order and rated their preferred ensemble sound. These two surveys were compared and no significant connection between preferred arrangement and preferred sound were found. Due to the poor quality recording equipment, the results cannot be considered valid. However, it was found that the highest percentage of the ensemble (44% which is not a majority) preferred singing in the arrangement of strictly sections.*

**Ross J. Fishman**, *University of Kansas*

## **A Comparison of Individual Placement Preference in an Ensemble to Preferred Group Sound**

## Review of Literature

A choral conductor has many different matters to attend to when trying to achieve a quality choral sound. For example, issues such as formation, spacing, room acoustics, room temperature, and much more, all affect the product of the choral sound. It is important that teachers are aware of what leads to better choral singing. Attending to specific details will only make it easier for the students in the ensemble to become successful. One of the most basic factors to choral sound is the acoustics speaking voice.

✓ Traunmuller and Eriksson (2000) found that in the speaking voice, there is a difference of vowel and consonant duration between men and women. This means that a choir teacher must work alone with matching the vowels and consonants with the men and woman before ever being concerned with pitches. These students are not able to distinguish the nuances in their vowel and consonant duration- they are only sure of what they hear from themselves. Another factor to choral sound that must be acknowledged by choir teachers is students hearing aptitude.

The choir singer has two acoustic signals to attend to: the sound of his or her own voice, and the sound of the rest of the choir (Ternstrom, 1994). This study discusses that the acoustics of the room effect what each singer hears from themselves and the group as a whole. It can be a problem if rehearsals are consistently held in a quality choir room where everyone can hear themselves clearly, and for the concert they go into the auditorium where there is poor acoustics. The singers will not hear themselves clearly and will sing less confident. This also brings up the situation of the Lombard effect. The Lombard effect is when one raises their voice in the presence of other loud sounds. Tokinson et al. discusses this matter in a choral context. He found that choral singers *are*

able learn to resist the Lombard effect. For this to be done, the singers must be putting lots of conscious effort. Note that a student will almost never resist the Lombard effect unless the teacher has instructed them to do so (Tonkinson 1994).

It is apparent that a lot of choral singing has to do with the individual singers' sensations. ✓ Coleman (1993<sup>?</sup>) discussed the difference in singing dynamics. He found that there is a higher output of sound pressure level when singing sustained vowels. In addition, he found that singers tend to sing fortissimo and mezzo forte closer than they sing piano and mezzo forte. This information gives further evidence that a singer likes to hear them self and therefore sing louder than they like to sing soft.

The style of a singing is also a sensation one has while singing in a choir. The style of singing (solo singing or choral singing) has been a popular issue relating to choral sound. ✓ Ford (2003) carried out a study on the preference of strong or weak singer's formant resonance in choral tone quality. He had different music major students give their preference of sound, and results showed a weak singer's formant, or non-resonant singing was preferred. ✓ Ekholm (2000) demonstrated that the preference of the style of choral singing is just a matter of personal opinion and does not have an absolute yes or no answer. It was found that voice teachers preferred no particular style of singing, whereas choral conductors preferred choral (blended) singing over the solo style of singing. ✓ Ternstrom (2002) wrote an overview on research in the past regarding choir acoustics. His overview discussed that it has been measured in different studies that solo singing requires more energy. The use of vibrato is more apparent in solo singing, which can affect the blend of the choir. The fact of the matter is that these two different styles of singing are acoustically very different, and the way of dealing with this issue is a

teacher's personal preference. There is also another factor contributing to choral sound that does not quite have a concrete answer.

This is the factor of the spacing and formation of the choir. ✓ Daugherty (1999) examines different types of formations a choir can have such as blocked sectional and mixed formation. He also examines the different spacing a choir can have such as close, lateral, and circumambient. The results showed that the auditors preferred the spread spacing over the others, but no particular formation was found to have had impact on the choral sound. ✓ Daugherty carried another study in 2003 that again tested the preference of choir spacing and formation. This time there were results that the auditors again preferred a random formation in addition to the spread spacing. Further studies of specifically choir formation affecting choral sound have brought some similar conclusions.

✓ Aspaas et al.<sup>?</sup> (2004) wanted to compare the acoustics of the three different traditional formations: block sectional, mixed, and sectional in columns, as well as compare the singers' preferences to these formations. He found that there was no specific formation that the singers preferred to sing in, and also that formation of the choir has no affect on the acoustical sound. It may be surprising for singers to hear that formation does not affect the type of sound that is heard in the audience. While many of us assume that the certain formation of a choir can affect the sound being heard, the same unexpected results are found in ✓ Mustafa's study of Acoustic Analysis of the interaction of choral arrangements and microphone location (2005). This study included the Florida State University Chamber choir singing two pieces in different arrangements. These arrangements were block sectional, sectional in columns, and mixed. Three microphones

recorded the choir at three separate locations. These microphones acoustically analyzed the sound by measuring Long-term average spectrum (LTAS). No significant difference was found in the sound from any of the formations at any of the microphone locations. It seems clear that the thought of different choral formations affecting the sound of the choir has only been a myth, and is not true.

Many factors go into the specific sound one hears in a choir. Most of the factors are simple, such as unifying vowels which can be easy to implement into the choir. Although, there are also factors such as the preference of singing style and the formation of a choir, which are always up for debate. At this point in time there have been many studies on the affects of the choir formation on sound, so it is now appropriate to look at the finer details. One may wonder if the affects of choir formation on sound are the same or different to the affect of ensemble (which has less people) formation on sound. It is important to address the singer's opinions as oppose to auditors opinions of what they think sounds best. The purpose of this research study is to compare individual placement preference in an ensemble with preference to the group sound.

## **Method**

### *Participants*

The participants for this study were taken from the University of Kansas Jewish A Cappella ensemble. This ensemble includes ~~3~~<sup>APA</sup> students at the University of Kansas that range from 18-22 years who all have different levels of singing experience. The group was composed of ~~3~~<sup>APA</sup> sopranos, ~~3~~ altos, ~~2~~ tenors, and ~~1~~ bass.

### *Instruments and Procedure*



The students were recorded singing the same piece of music in three different arrangements. After each performance, every member of the group filled out a survey regarding their comfort level in that specific run-through. Comfort level was noted on the survey to pertain to personal pitch accuracy, level of volume, blend, or anything else that they personally interpret as being comfortable. The piece the ensemble sang was *Zamru* by R. Scheinberg which had been previously memorized by every member of the group. It is important that the piece of music was memorized because it eliminates the variable of the student's unfamiliarity with notes affecting the group sound of each performance. The first arrangement that the group sang in was strictly sectional-based. The second arrangement included a section with mixed men voices next to another section with mixed women voices. The last arrangement was all mixed sections where every member of the group was standing beside someone else *not* in their same voice part.

One week later the ensemble met to listen to the recordings. The recordings were played in a random order. Each member then filled out a survey which asked them to rank the recordings in order by what they thought demonstrated the best ensemble sound. The results of the first set of surveys were taken and compared to the results of the second surveys.

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Table 1

*Three Different Singing Arrangements Tested*

Arrangement 1, Sections.....	S S S A A A T T B
Arrangement 2, Mixed women and mixed men.....	S A S A S A T B T
Arrangement 3, All sections mixed.....	S T A S B A S T A

*(S = soprano, A = alto, T = tenor, B = bass)*

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**Results**

The <sup>r</sup>results are broken down into three different areas. The first area of results pertains to each singer's level of comfort in the three specific arrangements. A visual of the three different arrangements are displayed in Table 1. The second area of results examines the singer's preferred ensemble sound after listening to the recordings in a random order. That last part of the results compare the singer's comfort level in each arrangement to their preferred ensemble sound of arrangement.

Surveys showed that there was no majority preference of comfort level in a specific arrangement. The highest level of preference was 44% ( $n = 4/9$ ) of the singers preferring to sing in sections, but the second highest was 33% ( $n = 3/9$ ) of the singers who didn't have any preference whatsoever. Singing in a mixed arrangement was rated most comfortable by 22% ( $n = 2/9$ ) of the singers while 0% ( $n = 0/9$ ) preferred to sing in an arrangement of solely mixed women and mixed men. When examining possible gender differences, half of the women ( $n = 3/6$ ) were most comfortable singing in sections and there was no leading preference in male comfort level.



The results of the preferred ensemble sound are similar to the rated arrangements on comfort level. After listening to the three different recordings of themselves, 44% ( $n = 4/9$ ) had no preference of ensemble sound between the recordings. The recording of the ensemble singing in sections was the second highest preferred ensemble sound with 33% ( $n = 3/9$ ). Only 22% ( $n = 2/9$ ) preferred the ensemble sound of the mixed arrangement, and the arrangement of mixed women and mixed men is the again the least preferred with 0% ( $n = 0/9$ ) rating of the singers. The majority of the males in the ensemble ( $n = 2/3$ ) had no preference between the different recordings, and 50% ( $n = 3/6$ ) of the women preferred the recording which was sang in sections.

The most important data collected, in which this study is based on, compares each singers comfort level to their preferred arrangement of ensemble sound. This important data collected shows that there is no pattern between these two variables. Table 2 shows the distribution of how many singers actually preferred the same arrangement to sing in as well rating it as the best ensemble sound.

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Table 2

*Compared singing comfort level to preferred ensemble sound*

*(Displaying the percentages of an exact match of singing comfort level and preferred ensemble sounds)*

Arrangement 1, Sections.....	22% ( $n = 2/9$ )
Arrangement 2, Mixed women and mixed men.....	0% ( $n = 0/9$ )
Arrangement 3, All sections mixed.....	11% ( $n = 2/9$ )
<b>NO MATCH.....</b>	<b>66% (<math>n = 6/9</math>)</b>

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Even though the results of these surveys do not prove any majority preference to draw significant conclusions, there is a slight pattern throughout each survey's results. All of the surveys present a consistent pattern in the order of most preferred and least preferred. In each survey, the 'arrangement of sections' or 'no preference at all' have the highest percentages. Every survey has the 'mixed arrangement' as the next highest percentage, and the arrangement of 'mixed women and mixed men' had the lowest percentage of popularity in each of the surveys.

## **Discussion**

One may look at the results and conclude that because there was never a majority preference of arrangement or sound, that there is no specific universal singer preference of placement or ensemble sound. Such findings support the research conducted by Aspaas (2004) who compared the acoustics of the three different traditional formations, and also Mustafa (2005) who studied the acoustic analysis of the interaction of choral arrangements and microphone location. Realistically, it is difficult to draw significant and meaningful conclusions for the results collected in this research because of the different variables that could have affected the results.

Even though the surveys were specific in to what the singers were supposed to be rating, it cannot prevent the individual bias that each singer has. For example, the level of comfort one has while singing may not be a matter of arrangement but a matter of the singer's individuality level. A very strong singer may feel comfortable in any arrangement while a weaker singer will obviously prefer to sing their section.

The most influential error in this study was the quality of recordings. The recording equipment was not a good enough quality for what was needed. Each recording had static throughout the entire song. This made it very difficult to decipher which recording sounds the best. It is possible that the recording of the arrangement in sections was preferred by 33% of the ensemble only because it had less static than the other recordings. There are also other variables that could have affected the results of preferred ensemble sound.

The purpose of having the singers rather than auditors rate which recording sounded best was to find any significant correlations between their preferred placement and preferred ensemble sound. Having this in mind, this also makes it difficult to find valid results because each singer has a different level of ear training. Thus meaning each singer has a different definition of what is a good ensemble sound. Another factor of the quality of recording is due to the room acoustics. These recordings were taken in the choir room at the University of Kansas which is one of the best acoustically designed choir rooms in the country. This is an unfortunate factor because the room is so good that it makes it very hard to decipher a good performance and a bad performance. Even an out of tune chord will ring and sound decent in this room. This variable supports Ternstrom (1994) in his research study on the acoustic signals one heard from his/her own voice, and also from the rest of the choir. Since the room in which these students sang in was so easy hear themselves, it could have made them more comfortable in each arrangement to an indefinite level.

An upsetting affair while conducting this research was that there were 16 expected singers which of only 9 showed up. Having only 1 bass made it difficult to

spread the bass section throughout the ensemble. The results from the 1 bass should not be analyzed the same as the others because every arrangement was like a mixed arrangement for him.

If having the opportunity to conduct this study again, I would be highly concerned with a variety of changes being made. Most importantly, I would go to far depths to make sure that the recording equipment is high-quality and will produce clarity. It is essential that the singers have a fair opportunity to clearly hear the recordings and rate them accordingly. It would also be important to sing in a less acoustically advanced room. A room in which had no acoustic ring at all would not be good either, but a room with a mediocre level of ring would be the best. It would be imperative to have more people, especially men, when conducting this study again. A maximum of 20 people would be advised because any more than that would be a choir and then the factor of finding any 'ensemble' correlations would be lost. Drawing strong conclusions from one ensemble may be helpful but does not mean any conclusions are valid. If a valid conclusion is going to be made form this study it must be after testing a few different ensembles, not just one.

The concerns of a choral teacher relating to the best choral sound cannot be limited to one issue. As more research is conducted, it is likely that valid results will be found. Today we are not sure how specific arrangements affect the sound of an ensemble, but we do have a clue that there may be no significant difference between any of the arrangements used in traditional performance. It would be advised that choral teachers deal with issues such as technique and phrasing before being concerned with the ensemble arrangement. Concentrating on the arrangement of the ensemble may just be

an irrelevant distraction that takes teachers away from what really is important, and that is the music.

## References

- ✓ Aspaas, Christopher (2004). Select Acoustic and perceptual Measures of Choral formation. *International Journal of Research in Choral Singing*. (2) 1.
- ✓ Coleman, RF. (1994). Dynamic intensity of individual choral singers. *Journal of Voice*, 8 (3), 196-201.
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19/20

## Review of Literature Scoring Criteria

### Level 5: 19-20 points

- The student draws extensively on evidence presented in the articles to support the conclusion. The conclusion makes coherent use of the evidence.
- Significant recognition of the authors cited; the student may have made some attempt to consider the author's findings or point of view in order to discuss the student's conclusion.
- The student recognizes multiple sides of the issue and is able to make transfers across topics; recognizes the strength and limitations of each position in taking a stand.

### Level 4: 17-18 points

Some criteria met from level 5 and some from level 3

### Level 3: 14-16 points

- The student has made a limited effort to use evidence from the articles to support the argument; the evidence may not support the conclusions or may be used somewhat incoherently.
- Some identification or recognition of author's work, but little development.
- The student recognizes that another side of the issue exists, but finds support for only his or her side; may tend to build up his or her argument by tearing down the other side.
- May be a "laundry list", citing much evidence both pro and con, but student unable to make transfers of the information in the articles to relate to their topic.

### Level 2: 11-13 points

Some criteria met from level 3 and some from level 1

### Level 1: 0-10 points

- The student does not cite evidence from the articles.
- No identification or recognition of author's work.
- Student sees only one side of the argument; no evaluation attempted.
- No evidence that the student used the articles; could have written the essay by only skimming the articles.

### Level 0

- Non-scorable response

Very well done! Fix some APA errors in the references and a few transitions

Ross Fishman

MEMT 366

Dr. Register

10-10-06

### Review of Literature

A choral conductor has many different matters to attend to while trying to achieve a quality choral sound. For example, issues such as formation, spacing, room acoustics, room temperature, and much more, all affect the product of the choral sound. It is important that teachers are aware of what leads to better choral singing. Attending to specific details will only make it easier for the students in the ensemble to become successful. One of the most basic factors to choral sound is the acoustics speaking voice.

*Great  
intro  
Ross!*

Traunmuller and Eriksson (2000) found that in the speaking voice, there is a difference of vowel and consonant duration between men and women. This means that a choir teacher must work alone with matching the vowels and consonants with the men and woman before ever being concerned with pitches. These students are not able to distinguish the nuances in their vowel and consonant duration- they are only sure of what they hear from themselves. This is another factor to choral sound that must be acknowledged by choir teachers.

*Transition*

The choir singer has two acoustic signals to attend to: the sound of his or her own voice, and the sound of the rest of the choir (Ternstrom, 1994). This study discusses that the acoustics of the room effect what each singer hears from themselves and the group as a whole. It can be a problem if rehearsals are consistently held in a quality choir room where everyone can hear themselves clearly, and for the concert they go into the

auditorium where there is poor acoustics. The singers will not hear themselves clearly and will sing less confident. This also brings up the situation of the Lombard effect. The Lombard effect is when one raises their voice in the presence of other loud sounds. Tokinson et al. discusses this matter in a choral context. He found that choral singers *are* able learn to resist the Lombard effect. For this to be done, the singers must be putting lots of conscious effort. Note that a student will almost never resist the Lombard effect unless the teacher has instructed them to do so. *↳ is this cited in that study?*

It is apparent that a lot of choral singing has to do with the individual singers' sensations. Coleman (1993) discussed the difference in singing dynamics. He found that there is a higher output of sound pressure level when singing sustained vowels. In addition, he found that singers tend to sing fortissimo and mezzo forte closer than they sing piano and mezzo forte. This information gives further evidence that a singer likes to hear them self and therefore sing louder than they like to sing soft.

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acoustics. His overview discussed that it has been measured in different studies that solo singing requires more energy. The use of vibrato is more apparent in solo singing, which can affect the blend of the choir. The fact of the matter is that these two different styles of singing are acoustically very different, and the way of dealing with this issue is a teacher's personal preference. There is also another factor contributing to choral sound that does not quite have a concrete answer.

This is the factor of the spacing and formation of the choir. Daugherty (1999) examines different types of formations a choir can have such as blocked sectional and mixed formation. He also examines the different spacing a choir can have such as close, lateral, and circumambient. The results showed that the auditors preferred the spread spacing over the others, but no particular formation was found to have had impact on the choral sound. Daugherty carried another study in 2003 that again tested the preference of choir spacing and formation. This time there were results that the auditors again preferred a random formation in addition to the spread spacing. Further studies of specifically choir formation affecting choral sound have brought some similar conclusions.

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unexpected results are found in Mustafa's study of Acoustic Analysis of the interaction of choral arrangements and microphone location (2005). This study included the Florida State University Chamber choir singing two pieces in different arrangements. These arrangements were block sectional, sectional in columns, and mixed. Three microphones recorded the choir at three separate locations. These microphones acoustically analyzed the sound by measuring Long-term average spectrum (LTAS). No significant difference was found in the sound from any of the formations at any of the microphone locations. It seems clear that the thought of different choral formations affecting the sound of the choir has only been a myth, and is not true.

Many factors go into the specific sound one hears in a choir. Most of the factors are simple, such as unifying vowels which can be easy to implement into the choir. Although, there are also factors such as the preference of singing style and the formation of a choir, which are always up for debate. At this point in time there have been many studies on the affects of the choir formation on sound, so it is now appropriate to look at the finer details. One may wonder if the affects of choir formation on sound are the same or different to the affect of ensemble (which has less people) formation on sound. It is important to address the singer's opinions as oppose to auditors opinions of what they think sounds best. The purpose of this research study is to compare individual placement preference in an ensemble with preference to the group sound.

See APA

## REFERENCES

- Aspaas, Christopher (2004). Select Acoustic and perceptual Measures of Choral formation. *International Journal of Research in Choral Singing*. (2) 1.
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**Materials and Methods Section Rubric**

19-20 ✓ Contains effectively, quantifiably, concisely organized information that allows the experiment to be replicated

✓ Written so that all information inherent to the document can be related back to this section

✓ Identifies sources of all data to be collected

✓ Identifies sequential information in an appropriate chronology

Does not contain unnecessary, wordy descriptions of procedures. *fix some wording*

17-18 As above, but contains unnecessary information, and/or wordy descriptions within the section.

14-16 Presents an experiment that is definitely replicable

All information in document may be related to this section

Fails to identify some sources of data and/or presents sequential information in a disorganized, difficult pattern.

11-13 Presents an experiment that is marginally replicable

The reader must infer parts of the basic design

Procedures not quantitatively described

Some information in Results or Conclusions cannot be anticipated by reading the Methods and Materials section.

0-10 Describes the experiment so poorly or in such a nonscientific way that is cannot be replicated.

Ross Fishman

MEMT 366

Dr. Register

## METHOD

### *Participants*

The participants for this <sup>study</sup> ~~research~~ were taken from the University of Kansas Jewish A Cappella ensemble. This ensemble includes 16 students at the University of Kansas <sup>that range in</sup> ~~from~~ ages 18-22, <sup>yr</sup> all with different levels of singing experience. The group was composed of 5 sopranos, 5 altos, 3 tenors, and 3 basses.

### *Instruments and Procedure*

The students were recorded singing the same piece <sup>of music</sup> in three different arrangements. After each performance, every member of the group filled out a survey regarding their comfort level in that specific run-through. The piece the ensemble sang was *Zamru* by R. Scheinberg which had been previously memorized by every member of the group. It is important that the <sup>piece</sup> ~~group~~ was memorized because it eliminates the variable of the student's unfamiliarity with notes effecting the group sound of each performance. The first arrangement that the group sang in was strictly sectional-based. The second arrangement included a section with mixed men voices next to another section with mixed women voices. The last arrangement was all mixed sections where every member of the group was standing beside someone else *not* in their same voice part. <sup>with what? with the sound? w/the arrangement of grp. members?</sup>

One week later the ensemble met to listen to the recordings. The recordings were played in a random order, ~~where the students could not decipher which arrangement was in which recording.~~ Each member then filled out a survey which asked them to rank the recordings in order by what they thought demonstrated the best ensemble sound. The results of the first set of surveys were taken and compared to the results of the second surveys.