



The Effect of Conducting Gesture on Singers' Perceptions of Inappropriate Vocal Tension

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Abstract

The purpose of this pilot study was to determine the effect of conducting gesture on singers' (N=16) perceptions of inappropriate vocal tension. Specifically, the potential of left hand conducting gesture to generate or prevent inappropriate vocal tension was examined.

A stimulus tape was created including a control conducting condition (left hand, no change) and five experimental conducting conditions: (a) left hand, fisted gesture; (b) left hand, palm up; (c) left hand, palm down; (d) left hand stabbing gesture; and (e) left hand, sideways, phrase-shaping gesture. Participants selected to evaluate the stimulus tape were members of a church choral organization. Prior to evaluating the stimulus tape, subjects were given a characterization of inappropriate vocal tension.

Results indicated significant differences ($t=6.34$, $df=15$, $p<.05$ two tailed) between the no change conducting condition ($M=4.31$, $SD=2.18$) and the stabbing gesture conducting condition ($M=7.63$, $SD=1.71$), and ($t=3.59$, $df=15$, $p<.05$ two tailed) between the no change conducting condition ($M=4.31$, $SD=2.18$) and the fisted gesture conducting condition ($M=7.44$, $SD=2.10$). The sideways, phrase-shaping conducting condition generated the lowest tension score ($M=3.19$, $SD=1.28$).

Identification of characteristics exhibited by effective teachers and conductors is an ongoing focus of research. In particular, studies of musical competency, personality traits, instructional delivery, and conducting skills appear pervasively in the teacher-conductor effectiveness literature.

The act of conducting is nonverbal in nature. It includes such elements as facial expression, eye contact, body position and posture, and conducting gesture. There are extensive bodies of extant literature on conducting gesture, vocal pedagogy, and choral singing. Empirical research addressing the vocal product of conducting gesture, however, is more scarce.

The issue of inappropriate vocal tension, labeled in numerous ways, appears in virtually all of the vocal and choral pedagogical literature. Thus, investigating the ability of choral conductors to use conducting gesture effectively in maintaining a sense of vocal well-being and health among singers may be needed.

According to Love (1993) nonverbal communication comprises "gestures, body movements, the use of interpersonal space, facial expression, touch, posture, paralanguage, gaze, eye contact, in addition to physical appearance and personal habits" (p 4944). Many such facets of nonverbal communication would appear to be intricately related to the nature of conducting gesture. Ideally, 100% of a conductor's communication is nonverbal in performance. In an analysis of movement and conducting gesture,

Benge (1996) concluded: (a) conducting is a type of nonverbal communication; (b) there is a universality to the language of conducting; (c) specific gestures and movements are generally interpreted in the same way; and (d) conducting skills of expressive conductors communicate a vast array of information.

Conducting gesture is one nonverbal element of communication utilized by the choral conductor in rehearsal and performance settings. Julian (1989) quotes Edward Sapir in defining conducting as “an elaborate code that is written nowhere, known by none, and understood by all” (p. 49). This communication is characteristically nonverbal and is demonstrated by both intentional and unintentional behaviors. A conductor communicates through “body language that includes eye contact, body orientation and posture, facial expression, movement of feet, torso, and head, in addition to the expected hand gestures” (Julian, 1980, p. 64). Such nonverbal communication may result in various responses from the singers. Madsen and Yarbrough (1980) illustrate the relationship between teacher behavior and educational outcome:

Regardless of what one [the teacher] says and what one does, research indicates that in classroom situations it is indeed what the teacher does that is translated into ideas and behaviors on the student's part...These ‘behaviors’ may be just a tiny nod or taking a breath, or making an extremely subtle conducting gesture, but they must be evident to the students (p 9).

Few studies have examined student responses to specific conducting gestures. Skadsem (1995) investigated the effect of four instructional conditions on dynamic responses in singers. The four conditions were (a) conductor verbalization, (b) dynamic markings in the score, (c) conductor gesture, and (d) choir dynamic level. Results indicated that verbal instructions given by the conductor invoked the most significant changes in the dynamic responses of singers.

Conducting texts are largely in agreement about the role of left hand gestures in conducting. Kaplan (1985) and Green (1992) stress the importance of left hand independence in conducting gesture. The left hand should not mirror the right hand, but should be used for specific musical emphasis. Cueing and the expression of crescendos and decrescendos are appropriate tasks for the left hand.

Many voice pedagogues and conductors have sought to define inappropriate vocal tension using

specific visual or audible characteristics. According to Miller (1996a), the tongue, the neck, and the jaw, working both separately and together, are three major sources of inappropriate vocal tension. Miller (1996b) further implies that tension in any one muscle group can affect another muscle group. McKinney (1994) characterizes visual vocal faults as “postural rigidity, collapsed chest, tight jaw, furrowed brow, raised shoulders, tilted head, white knuckles, knees locked back, shaking legs, heaving chest and so on” (p 18).

Kitch and Oates (1994) sought to define vocal tension from a performer's point of view. The muscular tension areas explored were the throat, jaw, neck, tongue, and chest. These researchers suggested that vocal fatigue was associated with perceptions of muscular tension. Bunch (1993) indicated that absence of vibrato was an indicator of strain on the voice. Six visually observable areas of inappropriate tension included overly active facial muscles, position and movement of the lower jaw, rigidity of the tongue, tension in the neck, tension in the chest, and emotional tension. In addition, Bunch proposed that both noisy breathing and a strident vocal sound were audible indicators of muscular tension.

Miller (1996b) discussed the relationship between proper vocal technique and longevity in singing. He contended that maintenance of physical condition, a healthy lifestyle, and proper technique in singing contributed to long-term voice use. Miller also suggested that voice category (e.g., soprano, alto, tenor, bass) could be a factor in longevity. Sundberg (1987) indicated that improved vocal technique could inhibit functional disorders of the voice. Sundberg identified two types of voice disorders: functional disorders, which stemmed from inappropriate use of the voice, and organic disorders, which stemmed from changes in the vocal tissues. Cook and Koenig (1995) examined causes of vocal fatigue and strain in choral singers. They cited the importance of vocal technique, as taught by both voice teachers and choral conductors.

Sapir (1993) examined vocal attrition in voice students. Students who reported voice problems were more likely to be anxious about their voice and were more likely to discontinue singing. Symptoms of vocal problems included hoarseness, reduced pitch range, voice fatigue, a sensation of tightness, and pain or discomfort in the throat.

Although those instructed in proper use of the vocal mechanism should theoretically care more diligently for their voices, the converse can be true. A survey by Galloway and Berry (1981) revealed

problems among voice performance and voice pedagogy majors. These problems included difficulties with articulation, voice quality, and resonance, and were associated with voice abuse, voice misuse, and pathological conditions. Milson (1971) found that voice disorders nation-wide occurred in approximately 1% of the population. Of respondents to his survey, 56% reported symptoms of voice disorders. Almost all of the respondents complained of vocal fatigue and sore throats after choral rehearsals.

The purpose of this study was to determine the effect of conducting gesture on singers' perceptions of inappropriate vocal tension. Specifically, the potential of a left hand conducting gesture to generate or prevent inappropriate vocal tension was examined. The following research questions guided this investigation:

1. Given a definition of inappropriate vocal tension, how will singers perceive possible inappropriate vocal tension while viewing a videotaped model of a conductor that includes the following left hand conducting conditions: (a) left hand, no change; (b) left hand, fisted gesture; (c) left hand, palm up; (d) left hand, palm down; (e) left hand, stabbing gesture; and (f) left hand, sideways phrase-shaping gesture?

2. What reasons will singers give for their evaluations of possible inappropriate vocal tension?
3. What impact does experience level have on perceived inappropriate vocal tension ratings?
4. How will singers evaluate the stimulus tape in terms of picture quality, sound quality, and clarity of conducting gesture?
5. Where will the visual focus of the singer be as they view the stimulus tape?

METHOD AND PROCEDURES

Sixteen singers participated in this study. Selected singers were members of a church choral organization in a large metropolitan area. Participants' choral singing experience varied greatly from less than one year to more than ten years' experience. Age range was 25-60 years.

A ten measure excerpt of the folk song, "Turtle Dove," served as the musical example for this study. The selected excerpt had a moderate range of a perfect ninth, a simple phrase structure, and a rhythmic simplicity that included only eighth notes, quarter notes, and dotted half notes. In addition, the excerpt began and ended on the tonic pitch (Figure 1).



Figure 1. The Turtle Dove

Fuelberth (2000) used the same musical example in another pilot study examining inappropriate vocal tension. To accommodate a variety of voice categories (i.e., sopranos, altos, tenors and basses) and to stay within appropriate range parameters for all participants, the excerpt was in the key of a minor. The key signature (no sharps or flats) was accessible to singers of various experience levels.

The researcher created four stimulus tapes for this study. Each tape included six conducting conditions, randomly sequenced on each tape to control for possible order effect. The first part of this study used only two of the stimulus tapes. Throughout each of the conditions the conductor maintained a legato four pattern in the right hand. The conductor used a baton in the right hand for the experiment. Each excerpt maintained a tempo of m.m. quarter note = 72.

The first four measures of each example served as a baseline. During these four measures the conductor conducted using only the right hand beat pattern. The following six measures served as experimental measures. During the experimental measures, six conducting conditions were utilized: (a) left hand, no change; (b) left hand, fisted gesture; (c) left hand, palm up; (d) left hand, palm down; (e) left hand, stabbing gesture; and (f) left hand, sideways phrase-shaping gesture. Two experienced music educators viewed the videotape to confirm the changes in conducting gesture.

The videotaped examples framed the conductor's upper and lower torso, including the conductor's face. During the experimental measures, the video camera zoomed in to isolate the conductor's hand motions and downplay facial expression. This procedure placed the conducting gestures in the center of the video frame. The conductor wore a black turtleneck and dark slacks for the videotape session. The

conductor was instructed to maintain a neutral facial expression throughout each of the six examples. To view samples of the stimulus tapes, [click here](#).

Singers rehearsed the musical example until they felt comfortable singing the tune from memory on a neutral syllable "loo." Singers then viewed a television monitor as they listened to instructions and responded to the conductor on a stimulus tape.

Each stimulus tape began with the same scripted instructions (Figure 2). Singers experienced two practice examples before responding to the six conducting examples used for analysis. After responding to the examples, singers completed Part 1 of a questionnaire (Figure 3). This part of the questionnaire addressed videotape clarity and the singer's visual focus.

Thank you so much for participating in this study. During the next seven minutes you will be singing the song "Turtle Dove" which you have prepared and memorized. You will sing the song six times while responding to a conductor. Each time will be somewhat different. Before we begin, let's practice the musical example. Just listen to the first example as it is played for you.

This time you will sing the example with accompaniment. A starting pitch will sound three times in tempo before you begin. Listen for the starting cues and then begin singing. We are now ready to start. If you have any questions, please ask them now.

Figure 2. Scripted Instructions on each of the Stimulus Tapes

Part 1
After viewing and responding to the videotape, answer the following:

Please circle your response:

Was the videotape picture clear?	Yes	No	
Was the videotape sound volume adequate?	Too Soft	Adequate	Too Loud
Were the conductor's gestures clearly visible at all times?	Yes	No	
Were the conductor's cues and entrances easy to follow?	Yes	No	
Were the conductor's releases clear?	Yes	No	
Was the conductor's beat pattern easy to follow?	Yes	No	

Please answer the following:

Where was your visual focus while responding to the videotape? _____

What do you think this project is about? _____

Please circle your response:

Did you have prior knowledge of the nature of this project?	Yes	No		
How many years have you participated in choral groups (High School and later)?				
Less than 1	1-2	3-5	6-10	More than 10

Figure 3. First Part of Questionnaire.

Singers then viewed one of the other four stimulus tapes while completing Part 2 of the questionnaire (Figure 4). The rating scale descriptors ranged from “minimum inappropriate vocal tension” to “maximum inappropriate vocal tension.” Prior to viewing the videotape, singers read and heard the following characterization of inappropriate vocal tension:

For the purpose of this study, inappropriate vocal tension is the audible or visible presence

of tension in the vocal mechanism.

Visible characteristics include muscular tension involving the face, jaw, neck, shoulders, arms, hands, torso, and legs. Audible characteristics include fluctuation in intonation, difficulty in executing higher pitches, and harsh tone quality.

The researcher established this characterization for purposes of this study. It was confirmed by four experienced voice teachers and choral conductors.

Part 2

You have been given a definition of inappropriate vocal tension. Please circle a number that corresponds to the level of inappropriate vocal tension that would or would not be hypothetically generated by each conducting example. After circling the number, please state the reason for your rating

Example 1

1 2 3 4 5 6 7 8 9 10
 minimum inappropriate maximum inappropriate
 vocal tension vocal tension
 Reason: _____

Example 2

1 2 3 4 5 6 7 8 9 10
 minimum inappropriate maximum inappropriate
 vocal tension vocal tension
 Reason: _____

Example 3

1 2 3 4 5 6 7 8 9 10
 minimum inappropriate maximum inappropriate
 vocal tension vocal tension
 Reason: _____

Example 4

1 2 3 4 5 6 7 8 9 10
 minimum inappropriate maximum inappropriate
 vocal tension vocal tension
 Reason: _____

Example 5

1 2 3 4 5 6 7 8 9 10
 minimum inappropriate maximum inappropriate
 vocal tension vocal tension
 Reason: _____

Example 6

1 2 3 4 5 6 7 8 9 10
 minimum inappropriate maximum inappropriate
 vocal tension vocal tension
 Reason: _____

RESULTS

The primary purpose of this pilot study was to determine the effect of a videotaped model of a conductor on perceptions of possible inappropriate vocal tension in singers. Upon viewing the stimulus tape and listening to a characterization of inappropriate vocal tension, singers rated each example according to its potential to generate tension. Experimental examples, containing left hand gestures, were compared to the control example, containing no left hand gesture, using a dependent *t-test*. Results showed that there was a significant difference ($t=6.34, df=15, p<.05$ two tailed) between the no change conducting condition ($M=4.31, SD=2.18$) and the stabbing gesture conducting condition ($M=7.63, SD=1.71$). Additionally there was a significant difference ($t=3.59, df=15, p<.05$ two tailed) between the no change conducting condition ($M=4.31, SD=2.18$) and the fist ed gesture conducting condition ($M=7.44, SD=2.10$). No significant differences were found between the no change conducting condition and the other three conducting conditions. A summary of the *M, SD,* and dependent *t test* results can be found in Tables 1 and 2

Table 1

Perceived Possible Inappropriate Vocal Tension Ratings by Choral Singers Including Mean Difference Scores and Standard Deviations

<i>Conducting Conditions</i>	<i>M</i>	<i>SD</i>
Sideways, Phrase-Shaping Gesture	3.19	1.28
No Change	4.31	2.18
Stabbing Gesture	7.63	1.71
Palm Up	4.25	2.11
Fisted Gesture	7.44	2.10
Palm Down	5.44	2.34

Figure 4. Questionnaire, Part Two

Table 2

Summary of the Results of the Dependent T Tests Comparing Mean Scores of Perceived Inappropriate Vocal Tension Between the Control and Experimental Conducting Conditions

<i>Conducting Conditions</i>	<i>T</i>	<i>df</i>
Sideways, Phrase-Shaping		
Gesture	1.82	15
Stabbing Gesture	6.34	15
Palm Up	0.07	15
Fisted Gesture	3.59	15
Palm Down	1.36	15

p<.05

Participants supplied written reasons for their ratings. Reasons for maximum inappropriate tension ratings (*n*>5) were tabulated into the following categories: rigid posture, muscular tension, lack of emotion, harsh movements, confusing gesture and facial expression. Reasons for minimum inappropriate vocal tension ratings (*n*<5) were tabulated into the following categories: flowing and relaxed, easy to follow, and little muscular tension. Tables 3 and 4 contain a summary of singers' reasons for minimum and maximum tension ratings.

Table 3

Reasons for Maximum Inappropriate Tension Ratings

<i>Reason</i>	<i>Number of Responses</i>
Rigid Posture	10
Muscular Tension	13
Lack of Emotion	4
Harsh Movements	10
Confusing Gesture	2
Facial Expression	3

Table 4

Reasons for Minimum Inappropriate Tension Ratings

<i>Reason</i>	<i>Number of Responses</i>
Flowing, relaxed	10
Easy to Follow	3
Little Muscular Tension	3

The third research question addressed the quality and clarity of the stimulus tape. All participants (100%) stated that the videotape picture was clear, the sound volume was adequate, the conductor's gestures were clearly visible at all times, and that the conductor's releases were clear. Of the participants, 87.50% indicated that the cues and releases were clear, while 93.75% indicated that the conductor's beat pattern was easy to follow.

The fourth research question sought to determine the visual focus of the subjects as they viewed the videotape. Most participants (81.25%) reported the conductor's hands were the visual focus, while 25% reported that the left hand was the visual focus. All responses of left hand were from singers with at least 6 years of post-high school choral experience. Subjects were also asked what they thought the project was about. All subjects indicated that the project was about the conductor, 50% cited singer response to the conductor, and 18.75% cited facial expression.

DISCUSSION

The vocal mechanism requires a certain amount of efficient tension in the body for energetic singing. However, inappropriate inefficient tensions can hinder healthy vocal production. Creating an atmosphere conducive to good vocal health benefits both conductor and singer.

The ability to create a positive learning environment appears to be a desirable trait among conductors and teachers. In an attempt to develop a model and assessment instrument, Gumm (1993) identifies ten dimensions of choral music teaching styles. One dimension, positive learning environment, involves teacher sensitivity to student fatigue and frustration. Another dimension, nonverbal communication, includes relying "primarily

on conducting gesture to communicate with students" (p 187). Some conducting gestures may be used to accomplish specific musical tasks, while other conducting gestures may communicate other unintended nonverbal messages. Various conducting gestures may be related to creating a positive learning environment.

Participants in this pilot study had a vast array of varied choral experience. With this varied experience came a certain set of pre-determined expectations and resultant evaluations of any choral conductor. Significant differences obtained between the perceived inappropriate vocal tension ratings of the stabbing gesture example, the fist ed gesture example and the no left hand example. Perhaps the potential of these conducting gestures to generate tension could cause conductors to reevaluate their effectiveness in performance and rehearsal settings. The sideways, phrase-shaping conducting condition generated the lowest tension score ($M=3.19$, $SD=1.28$), followed closely by the no change conducting condition ($M=4.31$, $SD=2.18$). This suggests that the function of left hand may also be to relieve inappropriate vocal tension.

Participants gave both specific and non-specific responses when asked to state a reason for their evaluations. Muscular tension and a lack of muscular tension were frequently reported as reasons for tension ratings. The descriptors "flowing" and "relaxed" were frequently used following a low tension rating. Muscular tension or relaxation on the part of the conductor may generate a similar response on the part of the singer.

Videotape quality was generally rated positively in this pilot study. The videotape playback equipment used was quite old and occasionally the background color would change. One singer noted the distracting nature of the color change. It was determined that newer playback equipment should be used for additional studies and that the same TV/VCR unit should be used for all participants. Clarity of conducting gesture was rated highly in this pilot study, suggesting that the stimulus tape may be appropriate for further studies.

The overall picture of the conductor includes body position and posture, right hand gesture, left hand gesture and facial expression. Therefore, the focus of the singer while viewing this stimulus tape is very important. In an effort to isolate left hand gesture and the experimental condition, the video camera zoomed in to capture the conductor's hands at the center of the screen. Most singers (81.25%) reported that the conductor's hands were the visual focus, while 25% reported that the left hand was the

visual focus. The videotape was likely effective in isolating the hand gestures of the conductor. Although the conductor was instructed to maintain a neutral facial expression throughout, 18.75% of participants cited facial expression as a point of focus. In order to further isolate the effect of conducting gesture, separate from facial expression, it may be necessary to examine alternative ways of eliminating facial expression as a variable without making the conductor appear unnatural. Further research is needed to examine singer's visual focus while in rehearsal and performance settings.

Further research in this area could be beneficial in determining the effect of both left and right hand conducting gesture, body position, and facial expression on inappropriate vocal tension in singers.

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