



THE ROLE OF CHORAL CONDUCTING IN THE DEVELOPMENT OF UNIVERSITY STUDENTS' MUSICAL AURAL SKILLS

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Abstract

This article examines the educational role of choral conducting in developing the musical aural skills of university students. Musical hearing is approached as a complex professional competence rather than merely the ability to distinguish pitches and intervals. It encompasses tonal and harmonic awareness, rhythmic perception, sensitivity to timbre and dynamics, musical memory, inner hearing, and the ability to anticipate, analyse, and evaluate musical sound.

The study is based on an integrative theoretical review and comparative examination of international research concerning aural training, choral singing, conducting gestures, vocal–auditory feedback, sight-singing, and technology-supported choral practice. The analysis indicates that choral conducting creates a multidimensional educational environment in which students read and interpret a score, construct an internal representation of the intended sound, communicate musical ideas through gesture, monitor individual vocal parts and the ensemble as a whole, identify performance problems, and make informed corrective decisions. The findings suggest that choral conducting contributes to the integrated development of pitch discrimination, intonation control, polyphonic listening, harmonic awareness, musical memory, audiation, and auditory self-monitoring. The article also proposes a four-stage pedagogical model that includes diagnostic assessment, formation of an internal auditory image, polyphonic listening and correction, and reflective self-evaluation. It is concluded that choral conducting should be taught not only as a system of manual beat patterns but also as an interconnected auditory, analytical, motor, interpretative, and pedagogical discipline.



Keywords: Choral conducting, aural skills, musical hearing, intonation, audiation, harmonic hearing, conducting gesture, choral rehearsal, musical memory, auditory self-monitoring.

INTRODUCTION

Contemporary higher music education requires students to progress beyond the mechanical reproduction of musical notation. A future conductor or music teacher must be able to imagine the desired sound before it is produced, compare the actual performance with the anticipated artistic result, identify discrepancies, and determine appropriate methods of correction. Research in auditory neuroscience has shown that systematic musical training is associated with the processing of pitch, timing, timbre, and complex acoustic signals.¹

Within the present study, musical aural ability is understood as an interconnected system of skills enabling a learner to discriminate pitch, intervals, tonal functions, chords, rhythm, timbre, and dynamics; retain musical material in auditory memory; imagine notated music internally; and assess performance in an informed manner. Wolf and Kopiez's Musical Ear Training Assessment demonstrates that analytical musical listening can be examined as a measurable and trainable practical competence.²

Choral conducting offers particularly favourable conditions for the development of these abilities. During a conducting activity, a student reads several vocal lines simultaneously, imagines their individual and combined sound, communicates tempo, metre, articulation, phrasing, and dynamics through gesture, and evaluates the sound produced by the choir. The conductor must therefore coordinate visual score reading, auditory anticipation, physical movement, analytical listening, and pedagogical decision-making.

Fundamental literature on choral pedagogy defines the conductor's responsibility as considerably broader than indicating metre or maintaining tempo. The conductor is expected to shape musical understanding, promote healthy vocal production, establish ensemble balance, interpret the artistic content of the composition, and

1 Nina Kraus and Bharath Chandrasekaran, "Music Training for the Development of Auditory Skills," *Nature Reviews Neuroscience* 11, no. 8 (2010): 599–605, <https://doi.org/10.1038/nrn2882>.

2 Anna Wolf and Reinhard Kopiez, "Development and Validation of the Musical Ear Training Assessment—META," *Journal of Research in Music Education* 66, no. 1 (2018): 53–70, <https://doi.org/10.1177/0022429418754845>.



guide singers towards a unified performance concept.³

In educational practice, however, choral conducting courses may sometimes place excessive emphasis on beat patterns, preparatory gestures, hand coordination, and external technical accuracy. When movement is taught separately from hearing, students may demonstrate technically correct gestures while remaining unable to recognise unstable intonation, inappropriate balance, weak harmonic tuning, or inconsistent tone quality.

The purpose of this article is to determine the principal mechanisms through which choral conducting supports the development of university students' musical aural skills and to propose a pedagogical model suitable for higher music education.

The study addresses the following research questions:

1. Which components of musical hearing can be developed through choral conducting?
2. How are conducting gesture, choral sound, and auditory feedback interconnected?
3. How can systematic aural development be integrated into conducting instruction?
4. Which criteria may be used to assess students' progress?

RESEARCH METHODS

The study employed an integrative literature review, comparative analysis, content analysis, and pedagogical modelling. Academic publications concerning musical hearing, choral singing, intonation, sight-singing, conducting gestures, auditory feedback, and technology-assisted choir training were examined.

The reviewed literature included peer-reviewed articles and academic books indexed or presented through scholarly platforms such as ERIC, PubMed, Frontiers, SAGE Journals, and international academic publishers.

The following criteria guided the selection of sources:

- direct relevance to musical hearing, singing, choral education, or conducting;
- presentation of findings related to pitch, intonation, harmony, rhythm, audiation, or auditory feedback;
- sufficient description of participants and research procedures;

³ Colin Durrant, *Choral Conducting: Philosophy and Practice* (London: Routledge, 2003); James M. Jordan, *Evoking Sound: Fundamentals of Choral Conducting*, 2nd ed. (Chicago: GIA Publications, 2009).



• relevance to higher education, professional music training, or choral pedagogy. The selected studies were grouped into six thematic areas: pitch and intonation; tonal and harmonic hearing; metrical and rhythmic perception; timbral and dynamic awareness; inner hearing and musical memory; and auditory self-monitoring and reflective practice.

No independent experimental study was conducted for this article. Consequently, the results presented below represent a comparative pedagogical synthesis of existing research rather than newly generated statistical findings.

RESULTS AND DISCUSSION

Components of Musical Hearing in Choral Conducting

The literature indicates that musical hearing should not be reduced to the identification of isolated pitches or intervals. A choral conductor must follow the horizontal movement of individual melodic lines while simultaneously perceiving their vertical harmonic relationship.

The following abilities operate together in the process of choral conducting:

- discrimination of pitch and interval relationships;
- recognition of stable and unstable scale degrees;
- perception of harmonic functions and chord structures;
- maintenance of metric and rhythmic stability;
- awareness of timbral and dynamic balance;
- internal representation of the musical score;
- retention of musical material in auditory memory;
- identification of performance errors;
- selection of effective corrective strategies.

A meta-analysis of 92 studies concerning sight-reading accuracy identified ear training, technical proficiency, improvisation, and musical knowledge among the factors most closely associated with successful sight-reading.⁴ This finding supports an integrated instructional approach in which score reading, internal hearing, vocal reproduction, and conducting are not taught as isolated activities.

4 Jennifer Mishra, "Factors Related to Sight-Reading Accuracy: A Meta-Analysis," *Journal of Research in Music Education* 61, no. 4 (2014): 452–465, <https://doi.org/10.1177/0022429413508585>.



The Auditory–Vocal–Motor Feedback Cycle

Choral conducting involves a recurring sequence of interconnected actions:

score perception → formation of an internal sound image → conducting gesture → perception of actual choral sound → comparison between intended and actual performance → corrective response

This cycle transforms listening from passive reception into active analysis and musical regulation. Even when the conductor is not personally producing the sound, the expected tempo, articulation, phrasing, dynamic profile, and tonal quality must exist internally before the gesture is made.

Conducting movement should therefore emerge from an anticipated musical result. The gesture becomes an external physical representation of an internally heard sound. After the choir responds, the conductor evaluates the result and adjusts both verbal instruction and gesture.

Singing also depends on a continuous relationship between auditory perception and vocal production. Within a choir, this internal feedback is expanded through interaction with other singers, the acoustic environment, and the conductor's directions. The singer must listen not only to his or her own voice but also to the surrounding harmonic and timbral context.

Experimental research on group singing has associated regular choral participation with changes in pitch-related auditory processing. Nevertheless, some of these studies involved older adults or other populations rather than university music students. Their results should therefore be interpreted cautiously when applied to higher education.⁵

Pitch Perception and Intonation Control

Choral conducting can develop intonation control at three interrelated levels:

1. matching an individual pitch to a given reference;
2. producing melodic intervals with accurate direction and distance;
3. adjusting a vocal line within a chord and the overall choral tuning system.

The source from which a reference pitch is obtained may also influence singing accuracy. In a study involving 99 university students, pitch-matching performance

⁵ Evan Dubinsky et al., "Short-Term Choir Singing Supports Speech-in-Noise Perception and Neural Pitch Strength in Older Adults with Age-Related Hearing Loss," *Frontiers in Neuroscience* 13 (2019): Article 1153, <https://doi.org/10.3389/fnins.2019.01153>.



varied depending on whether the reference was presented through piano, tuning fork, vocal model, or pitch pipe. Participants demonstrated comparatively greater accuracy after hearing a piano reference.⁶

This finding suggests that reference tones should be introduced gradually and strategically. At an early stage, the piano or a vocal model may provide sufficient support. At a more advanced stage, external assistance should be reduced so that students learn to maintain the tonal centre through auditory memory, relative pitch, and internal hearing.

The purpose of this progression is not necessarily to develop absolute pitch. Instead, it aims to strengthen tonal orientation, interval awareness, auditory retention, and the capacity to continue singing accurately without constant instrumental reinforcement.

Polyphonic Texture and Harmonic Hearing

One of the principal educational advantages of choral conducting is that it requires students to listen to several musical layers simultaneously. A conductor may follow the melodic direction of the soprano line while identifying an intonational problem in the tenor or bass section. The student must also recognise which chord member is incorrectly tuned and determine how that inaccuracy affects the overall sonority. A cappella singing is especially valuable because it prevents permanent dependence on equal-tempered piano tuning. It encourages singers to listen to interval relationships, resonance, chord structure, and the acoustic interaction among voices.

A qualitative study conducted over three semesters with higher education students found that singing harmony a cappella helped participants internalise theoretical concepts through direct auditory and vocal experience.⁷

The following activities may be used to strengthen harmonic listening:

- singing one part while listening actively to the remaining parts;
- rehearsing chord tones separately before combining them;

6 Jessica Nápoles, D. Gregory Springer, Brian A. Silvey, and Katie Adams, "Effects of Pitch Source on Pitch-Matching and Intonation Accuracy of Collegiate Singers," *Journal of Research in Music Education* 67, no. 3 (2019): 270–285, <https://doi.org/10.1177/0022429419863034>.

7 Helen Russell, "A Cappella Ear Training: Bringing Theory and Aural Skills Together via Singing in a Jazz Program Environment," *Australian Journal of Music Education* 51, no. 2 (2017): 20–28.



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- identifying tonic, dominant, and subdominant functions by ear;
 - locating the third, fifth, seventh, or another structural tone within a chord;
 - detecting a deliberately mistuned pitch;
 - alternating between internal and audible singing of different parts;
 - tuning sustained chords without piano support;
 - identifying which section is responsible for harmonic instability.

Such exercises connect theoretical knowledge with embodied sound experience and help students understand harmony as an audible phenomenon rather than merely a system of written symbols.

Conducting Gesture as a Visual Support for Hearing

A conducting gesture does not replace sound. Its purpose is to communicate an internally anticipated musical image. Through hand movement, posture, facial expression, and physical energy, the conductor indicates pulse, tempo, articulation, dynamic direction, breathing, phrasing, character, and culmination.

When movement and sound are meaningfully connected, students learn to hear, feel, analyse, and physically express musical processes as a unified experience.

In a study by Liao and Davidson, groups that received 24 sessions of gesture- and movement-based vocal training demonstrated greater intonational accuracy than groups that did not receive comparable movement instruction.⁸ As the study involved children, its findings cannot be transferred directly to university students. Nevertheless, it provides evidence for the pedagogical value of connecting melodic movement and pitch with bodily action.

A review of research on movement, gesture, and singing also identified possible relationships between physical movement and intonation, internal pulse, vocal quality, and singers' level of engagement.⁹

For this reason, students should first hear and understand the desired musical character and only then determine the physical gesture capable of communicating it. The opposite approach—forcing musical sound into a previously memorised beat pattern—may produce technically organised but artistically unconvincing conducting.

8 Mei-Ying Liao and Jane W. Davidson, "The Effects of Gesture and Movement Training on the Intonation of Children's Singing in Vocal Warm-Up Sessions," *International Journal of Music Education* 34, no. 1 (2016): 4–18, <https://doi.org/10.1177/0255761415614798>.

9 Crystal E. Kilpatrick, "Movement, Gesture, and Singing: A Review of Literature," *Update: Applications of Research in Music Education* 38, no. 3 (2020): 29–37, <https://doi.org/10.1177/8755123320908612>.



Development of Inner Hearing and Musical Memory

Inner hearing, frequently described as audiation, refers to the ability to imagine musical sound without an external acoustic stimulus. Before beginning a rehearsal or performance, a conductor should internally hear the tempo, tonality, phrasing, dynamic development, articulation, and balance of the composition.

The following activities may support the development of inner hearing:

- reading a vocal score silently while imagining each part;
- conducting selected passages without audible singing;
- listening to a short phrase and reproducing it from memory;
- transposing a melodic phrase into another key;
- singing one part aloud while audiating another;
- memorising chord tones and reproducing them in a different sequence;
- closing the score and reconstructing the phrase or conducting plan;
- imagining the final sonority before giving the preparatory gesture.

A neurofunctional study involving experienced singers found a strong relationship between singing experience and accurate pitch production.¹⁰ This suggests that systematic interaction between auditory imagery and vocal execution plays a significant role in the formation of reliable musical representations.

For a conductor, such representations are essential because effective gestures must be based on a clearly anticipated sound rather than on abstract physical movement.

Digital Technologies and Auditory Self-Monitoring

Audio and video recordings allow students to notice intonational, rhythmic, gestural, and interpretative problems that may not have been recognised during live performance. Listening after the rehearsal creates psychological distance and makes more objective analysis possible.

“Minus-one” recordings can also be used in choral instruction. In this format, one vocal part is removed while the remaining parts are preserved. The student then sings the missing part within the recorded harmonic context. This activity requires independent pitch maintenance and active harmonic listening.

A study involving 21 students who used virtual choir recordings for eight weeks

10 Sarah J. Wilson et al., “Finding Your Voice: A Singing Lesson from Functional Imaging,” *Human Brain Mapping* 32, no. 12 (2011): 2115–2130, <https://doi.org/10.1002/hbm.21173>.



suggested that this form of practice may support focused listening, intonation accuracy, tempo awareness, and independent learning.¹¹ However, the limited sample size and distance-learning context restrict the extent to which the findings can be generalised.

Digital resources should not be treated as substitutes for live ensemble interaction or professional pedagogical feedback. Their primary function is to strengthen reflective listening, individual preparation, and auditory self-correction.

A Pedagogical Model for Developing Aural Skills through Choral Conducting

Based on the reviewed literature, a four-stage model is proposed.

Stage	Main activities	Skills developed	Assessment criteria
1. Diagnostic assessment	Recognition and reproduction of pitches, intervals, rhythms, chords, and short melodies	Identification of the student's initial aural level	Accuracy of responses, degree of pitch deviation, rhythmic precision
2. Formation of an internal auditory image	Solfège, audiation, reference tones, silent score reading, pre-conducting sound imagination	Relative pitch, tonal orientation, inner hearing	Accuracy when external support is gradually reduced
3. Polyphonic listening and correction	Separation of vocal parts, chord tuning, identification of errors, balance analysis	Harmonic hearing, timbral sensitivity, ensemble awareness	Speed and accuracy in locating the problematic pitch or section
4. Reflection and self-assessment	Audio recording, virtual choir tasks, written listening analysis	Independent auditory control and pedagogical judgement	Ability to explain the cause of an error and propose a correction

Standardised or adapted tasks may be incorporated into the diagnostic stage. The Musical Ear Training Assessment developed by Wolf and Kopiez contains a complete 53-item model as well as shorter forms consisting of 10 and 25 items.¹² Rather than reproducing the instrument without permission or contextual adaptation, educators may use its assessment principles to construct institutionally appropriate diagnostic tasks.

¹¹ H. C. Eren and E. K. Öztug, "The Implementation of Virtual Choir Recordings during Distance Learning," *Cypriot Journal of Educational Sciences* 15, no. 5 (2020): 1117–1127, <https://doi.org/10.18844/cjes.v15i5.5159>.

¹² Wolf and Kopiez, "Development and Validation of the Musical Ear Training Assessment—META," 53–70.



Suggested Structure of a Conducting Lesson

A 60–80-minute lesson may be organised as follows:

1. Auditory activation — 10 minutes: recognition and singing of tonal centres, intervals, chords, and rhythmic patterns.
2. Audiation activities — 10 minutes: silent score reading, internal rehearsal of phrases, and reproduction from memory.
3. Conducting and choral practice — 25–35 minutes: listening to the ensemble, recognising problems, and providing gestural and verbal correction.
4. Polyphonic analysis — 10 minutes: examination of harmony, vocal balance, tuning, and timbral unity.
5. Reflection — 5–10 minutes: analysis of a recording, identification of causes of error, and formulation of individual goals.

This distribution is offered as a methodological recommendation rather than as a universally validated experimental standard. It may be modified according to students' level, the complexity of the repertoire, and the institutional context.

CONCLUSION

First, choral conducting is a complex educational activity through which auditory perception, internal sound representation, vocal experience, physical gesture, musical analysis, and pedagogical decision-making are developed simultaneously. Second, participation in choral conducting activities can strengthen not only pitch and intonation accuracy but also tonal and harmonic awareness, rhythmic stability, timbral and dynamic sensitivity, musical memory, audiation, and the ability to analyse polyphonic texture.

Third, conducting gestures should be understood as physical expressions of an internally anticipated sound. When gesture is taught separately from listening, students may acquire externally correct conducting techniques without developing sufficient auditory control.

Fourth, instruction should gradually reduce excessive dependence on piano support and teacher modelling. Greater attention should be given to a cappella singing, internal hearing, tonal memory, polyphonic listening, independent error detection, and the tuning of chords within a live acoustic context.

Fifth, recordings, virtual choir platforms, and part-removal exercises may



strengthen reflective listening and auditory self-monitoring. However, these technologies cannot fully replace live choral interaction or the immediate pedagogical guidance of an experienced conductor.

Finally, several of the reviewed studies were conducted with children, older adults, jazz students, or other specialised participant groups. Further empirical research is therefore required to evaluate the proposed model specifically among university music students in Uzbekistan. Such studies should employ diagnostic instruments, experimental and control groups, pre- and post-intervention assessment, and clearly defined indicators of aural development.

Choral conducting should consequently be taught not merely as a collection of beat patterns and manual techniques, but as an integrated professional process involving hearing, anticipating, communicating, monitoring, analysing, and correcting musical sound.

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