**Research Report**

# Can you See the Sound? Visual communication in brass ensemble for inclusive music-making

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**Abstract**

本稿では、聴覚障害を持つ音楽家としての筆者の演奏実践に基づき、「聴くこと」のみには依存しないブラス音楽表現の可能性を探求する。演奏時の視覚的手掛かりや身体的ジェスチャー、特にコダーイ式ハンドサインを応用することで、聴覚情報を補完する新たなコミュニケーション 手法を試みた。ブラスアンサンブルにおいては高い音圧や複雑な音響環境のため、補聴器を用いても音の細部を十分に把握することが困難である。この課題に対し、筆者は色分け譜面や身体動作を取り入れた練習法を導入し、奏者同士が視覚的・身体的に連携できる演奏環境の構築を試 みた。これらの実践を通して、聴覚障害を持つ奏者が主体的に音楽活動へ参加する可能性、さらには音楽教育・演奏現場における包摂的な実践研究の意義を明らかにする。本発表では、筆者自身の演奏経験と創作過程を中心に、視覚的表現を介した音楽の新たな知覚および創造性の拡張 について報告する。

**Abstract**

This paper presents a practice-based artistic research project developed by a brass musician with hearing loss, exploring alternative forms of musical communication beyond auditory perception. By integrating visual and gestural cues—such as colour-coded notation, bodily movement, and Kodály-inspired hand signs—the research examines how performers can interact and express musical intention within ensemble settings without relying solely on sound. In brass performance, the high-decibel environment and complex acoustics often limit the effectiveness of hearing aids, creating significant barriers for musicians with hearing impairments. Through the incorporation of visual and physical methods, this research demonstrates how inclusive performance practices can support communication, collaboration, and creativity across diverse hearing experiences. Drawing from the author's own artistic practice, the paper highlights both the creative process and the broader implications for inclusive music education and ensemble performance.

## 1. Introduction

Music is widely recognised as an auditory experience, and people who hear the sound differently are often excluded from music making. This practice-based artistic research investigates how visual communication can enhance musical experience, communication, and participation for musicians with hearing impairments—particularly within brass band settings. The researcher, Noa Kurumi Nishizawa, founder of the artistic research project *Can You See the Sound?*, is a professional brass musician with profound bilateral hearing loss (deaf in the right ear and with severe-to-profound loss in the left, assisted with hearing aids). She has performed internationally as a euphonium and baritone horn player and has continued professional ensemble activity despite significant hearing challenges, shaping a unique artistic perspective grounded in lived sensory experience. Despite the challenges she received bachelor's degree with first class with honours and master's degree in artistic research and performance with distinction at the Royal Northern College of Music.

The primary aim of this research is to explore how visual communication strategies—including gestures, eye contact, and adapted hand-sign methods—may support brass musicians with damaged or asymmetric hearing. Hearing loss within British-style brass bands is not uncommon; these ensembles rehearse in acoustically small rooms and frequently reach high sound pressure levels. Yet within traditional brass band culture, which is historically rooted in amateur and community music-making, musicians who acquire hearing damage often retire rather than seek adaptive or protective strategies. The assumption that "hearing differently" is incompatible with participation persists, partly due to a lack of awareness of the role of visual communication already embedded in ensemble practice.

From Nishizawa's experience, even fully hearing brass musicians rely heavily on visual cues—conductor breathing, body movement, bell direction, eye contact, and ensemble micro-gestures—though this reliance is seldom consciously acknowledged. This project therefore aims not only to identify visual communication strategies beneficial to musicians with hearing loss, but also to raise aware-

ness more broadly within brass band culture and higher music education. The goal is to demonstrate that musical participation is still possible, sustainable, and creative for musicians who hear differently, and to build knowledge that can inform inclusive practice in ensemble performance contexts.

The significance of this study lies in its positioning at the intersection of artistic practice, disability studies, and ensemble performance. By foregrounding the embodied knowledge of a deaf/HoH brass musician, this research challenges normative assumptions about hearing, musical ability, and ensemble participation, proposing visual communication as both an artistic tool and a means of reimagining accessibility within traditional brass culture.

## 2. Background / Literature Review

For musicians with hearing loss, music often becomes a multi-sensory experience, involving not only sound but also vibration, visual information, and physical cues. For these performers, music is not confined to listening; it becomes an embodied, tactile, and visual practice—felt through the whole body as much as heard through the ears. Existing research reflects a growing recognition of this multisensory dimension within accessible and inclusive music-making.

In digital and solo music-making environments, numerous technological tools have been developed to support musicians with hearing impairments. These include animated or interactive scores, pitch-tracking systems, and real-time audio visualisers capable of depicting gesture, timbre, and melodic contour through movement and colour. As Filipe and Vieira note, such systems can act as a "second pair of ears," providing a visual map of musical structure where auditory information may be incomplete. Real-time displays translating pitch, rhythm, or spectrum into dynamic visual forms can therefore offer clarity and confidence for performers who cannot rely solely on auditory cues.

However, these tools prove far less effective in live ensemble settings, particularly in traditional brass bands. They require screens, amplification, real-time processing, and technical infrastructure rarely available in everyday rehearsals. Moreover, technology can interfere with the spontaneous, relational, and embodied nature of ensemble communication. Brass musicians often depend heavily on interpersonal cues— breathing, gestures, bell direction, and physical presence—which current visualisation technologies cannot reliably replicate in a practical or accessible way.

Vibration-based technologies represent another strand of innovation. Wearable vibration packs can translate low frequencies into tactile sensations, assisting rhythm and pulse perception. Yet in brass environments—where the room and instruments vibrate continuously—these devices may add confusion rather than clarity. As Fulford's doctoral research notes, musicians may struggle to distinguish meaningful rhythmic information from environmental resonance, a situation comparable to "reading braille on a moving bus."

A more low-tech strategy involves score adaptations such as colour-coded notation designed to highlight structural and expressive cues. These markings can indicate dynamics, phrase boundaries, or instrumental roles, assisting performers who rely on visual clarity rather than auditory detail. While not replacements for conventional notation, such systems provide an additional supportive layer—particularly valuable during fast changes or dense ensemble textures.

Despite these innovations, many existing tools remain technologically demanding, costly, or optimised for individual practice rather than ensemble settings. Most musicians rehearse in modest band rooms or college spaces without advanced equipment. Moreover, not all musicians—hearing or otherwise—possess the technical literacy required to use specialised hardware or software.

Consequently, many Deaf and hard-of-hearing musicians rely on community-led, embodied strategies developed through lived experience. Fulford (2011) documents adaptive techniques such as watching the conductor's breathing patterns, following micro-gestures, or reading colleagues' eye movements and facial expressions. These subtle cues—often unnoticed by hearing musicians—can be essential for ensemble synchronisation.

Despite the growing body of work on hearing loss and music perception, and despite extensive studies on ensemble communication in orchestral or chamber settings, **no research to date examines these issues within the context of British-style brass bands**. Existing scholarship tends to focus on solo musicians, digital environments, general music classrooms, or mixed-instrument ensembles. Yet the brass band environment is unique: it operates at consistently high volume levels, rehearses in acoustically small rooms, and relies heavily on close sectional interdependence. Hearing loss is common in these settings, yet the cultural expectation is often to withdraw from playing rather than adapt. Crucially, although visual and embodied cues are central to brass band rehearsal practice, their potential to support musicians with hearing impairment has never been systematically studied or theorised. This represents a significant gap that the present project directly addresses by examining multisensory communication, hand-sign systems, and visual strategies tailored specifically to brass band performance.

Nishizawa's own experience reinforces this need. Visual cues form a significant component of her ensemble participation, yet these cues are rarely acknowledged or taught. This highlights the broader underexplored potential of visual communication as a pedagogical tool within ensemble contexts. The research therefore develops a simple, accessible hand-sign system for brass ensembles to make visual communication explicit, intentional, and inclusive.

Ultimately, the literature suggests that the most effective solutions may not be technological but relational. Rather than asking how to "fix" hearing loss with devices, a more productive question emerges: *How can ensemble music-making become more flexible, responsive, and inclusive for musicians who hear differently?* Visual communication offers one such pathway—grounded in human connection, shared awareness, and the creative possibilities of multisensory musical experience.

## 3. Method / Approach

This project employs a practice-based artistic research methodology, in which artistic action—performance, rehearsal, improvisation, collaboration—constitutes both method and outcome. Knowledge emerges not from detached observation but from embodied musical engagement, particularly under conditions of altered or reduced auditory perception. As a musician with profound bilateral hearing loss, the researcher's sensory experience is integral to the methodological framework.

### 3.1. Artistic Practice as Research

Three strands of practice form the core research environments:

1. **Solo performance.** Investigating techniques for pitch internalisation, structural awareness, and expressive shaping without full auditory input. This includes:
    - kinaesthetic memory
    - breath-based timing
    - visual pitch verification
    - silent reading practice
2. **Duo performance: Sakura Drops Duo (baritone horn and percussion).** Working with percussionist Sharon Fung (Sakura Drops Duo), the research explores:
    - gestural synchronisation
    - mallet movement as visual timing information
    - non-verbal coordination through body angle, eye contact, and shared breath
    - creating ensemble cohesion without fully relying on auditory information
3. **Brass band participation (Middleton Band, UK).** In a real-world community brass band environment—high SPL, small rehearsal rooms, complex textures—the researcher documents:
    - naturally occurring ensemble visual cues
    - role of the conductor
    - moments when auditory information is insufficient
    - survival strategies used by brass musicians with hearing damage
    - cultural attitudes toward hearing loss in brass bands

Throughout these settings, the researcher maintains reflective journals, rehearsal notes, video documentation, and autoethnographic writing.

### 3.2. Performance Studies as Method

Two major performance projects function as research laboratories:

#### *3.2.1. RNCM Spotlight Concert – "Can You See the Sound?" (2024)*

This concert tested multiple modalities of musical visibility:

- Silent conducting (Thierry De Mey): evaluating breath and gesture as primary communication
- Live score visualisation (Deri Roberts): examining real-time structure visibility
- Video imagination score (Fung & Nishizawa): exploring visual equivalents of musical contour
- Lighting design (Deddos): using colour/light as structural indicators
- Visible ensemble communication (Daughtrey): foregrounding micro-gestures

The aim was to understand how performers and audiences interpret multisensory musical information.

#### *3.2.2. Master's Final Recital – "Can You See the Sound?" (2025)*

A 45-minute recital performed entirely without hearing aids, treating deaf performance as artistic strategy rather than deficit. The programme included new commissions, arrangements that integrate hand signs, collaborative works requiring visual communication, and a premiere based on the researcher's own hearing-loss journey. This recital tested pitch perception through gesture, ensemble synchronisation via visual cues, emotional expression without auditory monitoring, and audience interpretation of multisensory performance.

### 3.3. Data Analysis

Analysis followed a qualitative, thematic approach:

- Reflexive journals documenting challenges, adjustments, and sensory experiences
- Video analysis of rehearsal/performances focusing on gesture, gaze, and timing
- Audience and collaborator feedback (informal semi-structured interviews, survey and written comments)
- Cross-context comparison across solo, duo, and brass band situations

The emphasis is on developing embodied, transferrable strategies for inclusive performance.

## 4. Case Studies / Preliminary Findings

### 4.1. Case Study 1: RNCM Spotlight Concert

The concert demonstrated that musical meaning can be conveyed through gesture, movement, light, and spatial orientation. Preliminary insights include:

- Silent conducting confirmed that breath, posture, and arm motion provide sufficient timing cues for ensemble cohesion.
- Live tracking scores aided structural awareness but required stability and technical support.
- Lighting and video enhanced audience understanding, suggesting strong potential for visual literacy in music perception.
- Audience feedback indicated that they "noticed communication they had never seen before," revealing that much ensemble coordination is tacit and invisible in typical concerts.

### 4.2. Case Study 2: Master's Recital Without Hearing Aids

Key findings include:

- Without auditory support, the performer relied on embodied resonance, kinaesthetic memory, instrument vibration, and visual contact.
- Kodály-inspired hand signs were effective for non-auditory pitch internalisation, particularly in *Après un Rêve*.
- Duo performance emphasised trust, breath, and gesture as substitutes for auditory blend.
- New compositions (*Desolate Landscape*, *See the Sound*) benefitted from a multisensory approach, integrating movement and visual elements into their structure.

These outcomes show that musical intention and expressivity do not depend solely on hearing.

### 4.3. Cross-Context Thematic Findings

**Theme 1:** Visual communication is already central to ensemble performance. Hearing musicians use breath, gesture, and body movement continuously but rarely consciously recognise these strategies.

**Theme 2:** Deaf/HoH strategies benefit all musicians. Clarifying visual cues improves ensemble cohesion and reduces reliance on verbal instruction.

**Theme 3:** Technology is less effective than human communicative strategies. High-SPL brass environments undermine vibration devices and real-time apps.

**Theme 4:** Inclusion is cultural, not technological. The primary barrier is not hearing loss but assumptions within brass band culture.

## 5. Discussion

The findings of this project challenge the assumption that musical participation is fundamentally auditory. Through embodied experimentation, the research demonstrates that musical communication is multimodal— comprising visual, tactile, kinaesthetic, emotional, and spatial information. This aligns with scholarly discussions on multisensory listening, but extends them by grounding insights in lived experience and performance practice.

A key contribution of this study is the reframing of hearing loss not as a limitation but as a creative condition that reveals alternative pathways to musical understanding. The absence of auditory detail forces heightened awareness of gesture, breath, and physical resonance, which in turn exposes the underacknowledged visual infrastructure of ensemble performance. Rather than compensatory, these visual strategies constitute an aesthetic in their own right.

Moreover, the research highlights the disparity between technological approaches to accessibility and the realities of acoustic instrumental settings. Vibration devices and visualisation tools often assume controlled environments—not the reverberant, loud, community-based spaces of brass bands. In contrast, human-centred, low-tech strategies (breath cues, hand signs, gesture systems) prove more adaptable, immediate, and culturally sustainable.

Finally, the project identifies a cultural barrier: in traditional brass band contexts, hearing loss is frequently met with resignation rather than adaptation. By presenting viable visual alternatives, the research advocates for inclusive ensemble cultures, where sensory diversity is acknowledged and creative methods are valued.

## 6. Conclusion

This practice-based study demonstrates that visual and gestural communication can significantly enhance musical experience and artistic expression for musicians with hearing loss—while also enriching ensemble practice more broadly. The performances and collaborations documented here reveal that music can be seen, felt, and experienced through multiple sensory channels, challenging the dominance of auditory perception in brass band culture.

The work argues for an expanded understanding of musicianship that embraces multisensory awareness, embodied communication, and inclusive artistic practices. By foregrounding the lived experience of a deaf/HoH brass musician, the research offers a model for reimagining how musical communities can support and collaborate with diverse sensory identities.

Future work will involve developing a systematic visual communication framework for brass ensembles—incorporating hand signs, gestural cues, and pedagogical tools—and testing it in educational and community settings. Ultimately, this project seeks to foster a musical

environment where hearing differently is not a reason to leave, but a reason to innovate.

## 7. Implications

The findings of this research have several important implications for brass pedagogy, ensemble culture, and accessibility within music performance.

### 7.1. Rethinking musicianship as multisensory

This study demonstrates that musical participation does not rely solely on auditory input. Visual, tactile, and kinaesthetic information can support expressive performance, ensemble coordination, and musical understanding. Recognising musicianship as a multisensory practice opens possibilities for:

- inclusive rehearsal methods
- diversified teaching strategies
- broader conceptions of musical ability

### 7.2. Revising ensemble pedagogy

Brass band and wind ensemble conductors often assume that auditory listening is the primary mode of ensemble communication. This research reveals that breath cues, facial expressions, hand signs, and body alignment form a robust visual communication system that can be intentionally developed and taught. Formally incorporating these strategies may support both hearing and deaf/HoH musicians.

### 7.3. Empowering hearing-impaired musicians

By demonstrating practical, low-tech methods for ensemble participation, this research challenges the belief that hearing loss necessitates musical withdrawal. The project shows:

- musicians with hearing loss can continue performing
- visual strategies can replace or supplement auditory monitoring
- identity and artistry can grow through sensory difference

### 7.4. New creative opportunities

Multisensory performance introduces expressive possibilities involving choreographic movement, lighting, gesture-based notation, multimedia integration, and collaborative scoring with composers. Such approaches expand the palette of artistic research in brass performance and contemporary music.

## 8. Limitations

While the research offers meaningful insights, several limitations must be acknowledged:

### 8.1. Researcher-specific sensory profile

Findings are based on the experiences of one performer with a unique combination of:

- profound unilateral deafness
- severe-to-profound hearing loss on the other side
- professional brass training

Different hearing-loss profiles may yield different experiences and strategies.

### 8.2. Limited scale of ensemble testing

The project involved one brass band (Middleton Band), one duo partner, and selected contemporary performance settings. A wider range of ensemble types—youth bands, professional groups, orchestras—would provide a more generalisable picture.

### 8.3. Limited technological exploration

The study prioritised human, embodied communication strategies over technology. While this choice aligns with the realities of community brass bands, it means that newer digital tools were not extensively tested and data on hybrid technological–embodied approaches remains limited.

### 8.4. Absence of quantitative measurement

This project prioritises qualitative, practice-based analysis. However no formal perceptual tests, SPL (sound pressure level) measurements, or controlled experimental data were collected, which limits certain forms of validation.

## 9. Future Work

Building on the findings, several future directions emerge:

1. Develop a visual communication system for brass ensembles based on Kodály hand signs, conductor cues, and performer micro-gestures. This toolkit will include hand-sign vocabulary for pitch and timing, gesture-based instructions, colour-coded score adaptations, and visual rehearsal protocols.
2. Pedagogical integrations: collaborate with brass band conductors, conservatoires, and music education programmes to evaluate multisensory methods in teaching.
3. Wider ensemble testing: apply strategies to chamber groups, orchestras, wind ensembles, and youth bands to explore cross-context applicability.

4. Composer collaboration: develop new works designed for deaf/HoH performers and multisensory notation.
5. Long-term autoethnographic study: chronicle performance life as a hearing-impaired brass musician to deepen understanding of sensory change, adaptation, and identity.

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## Author's Profile

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