

Embodied Music Theory: New Pedagogy for Creative and Aural Development

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INTRODUCTION

This article presents a snapshot of pedagogical practice that integrates singing, expressive physical gesture, aural development, music theory and creativity. The approach it outlines forms an attempt to transcend the instructional mode by which music theory is perceived by students to be independent of musical practice,¹ or an artificial construct by which Western Conservatoire-trained educators impose their assumptions on students who find it of limited relevance or interest.² It represents a response to the position, encountered in several educational contexts internationally, whereby students whose aural and musicianship development has failed to match their performing abilities or musicological knowledge aspire to tertiary music courses. In this sense, it re-visits the same problems that motivated Émile Jaques-Dalcroze³ to devise the pedagogical innovations he introduced, which also had their origin in meeting the needs of Conservatoire students, and similarly addresses the potential of teaching music theory with minimal reliance on verbal instruction or notation.

The pedagogy presented here, referred to as “harmony signing,” sets out to provide real and quintessentially musical⁴ experience through giving students leadership roles via which they can acquire the confidence to create and share within the discourse of music; and to achieve this through the elusive medium of collective creativity. It draws both on theories in evolutionary musicology to which I have contributed in complementary investigations,⁵ and on

¹ Graham Welch, *The misunderstanding of music* (2001).

² Malcolm Ross, “What is wrong with school music?” *British Journal Of Music Education*, 12 (3) (1995): 185-202.

³ Émile Jaques-Dalcroze, *Rhythm, music and education* (1921).

⁴ Keith Swanwick, *Teaching Music Musically* (1997).

⁵ Nicholas Bannan, “Language out of Music: the four dimensions

recent neurological research that advocates integrated learning in music.⁶

BACKGROUND

Harmony signing initially developed as an extension of existing pedagogical practice rooted in Kodály.⁷ It was first applied from 1994 in teaching members of the Reading University Children's Choir (ages 7-10) how to compose and arrange their own songs. Over the last fifteen years, harmony signing has been the subject of further research and development internationally,⁸ leading to a framework that links the initial experience of which seven-year-olds have proved capable, to advanced work based on these foundations that has been achieved by teenage students of the Yehudi Menuhin School in the UK, by University and Conservatoire students in Germany, Brazil, England and Australia, and by Mandarin-speaking music teachers in Beijing, China. The technique has become embedded in the first year aural program at the University of Western Australia, since it proves a useful means of developing confidence in students for whom aural can appear as

of vocal learning," *The Australian Journal of Anthropology* 19 (3) (2008) 272-293; Nicholas Bannan "'Reverse-Engineering' The Human Voice: Examining The Adaptive Prerequisites For Song And Language," *Proceedings of the Fifth Triennial Conference of the European Society for the Cognitive Sciences of Music* (2003); see also Steven Mithen, *The singing Neanderthals* (2005).

⁶ Lawrence Parsons, "Exploring the functional neuroanatomy of music performance, perception, and comprehension," *Annals of the New York Academy of Sciences* 930 (2001): 211-231; Wilfried Gruhn & Frances Rauscher (Eds) *Neurosciences in music pedagogy* (2007); see also Steven Mithen "The diva within," *New Scientist* 197 (2008): 38-9.

⁷ Zoltan Kodály, *The Selected Writings of Zoltán Kodály* (1974).

⁸ Nicholas Bannan, "Music Teaching without words," *Proceedings of the 1st International Symposium on Cognition and the Musical Arts* (2005): 400-405.

_____. "A Role for Action Research Projects in Developing New Pedagogical Approaches to Aural and Musicianship Education," *The Music Practitioner: Exploring practises and research in the development of the expert music performer, teacher and listener*. (2004): 295-308; Nicholas Bannan, "Gestural Language for the Representation and Communication of Vocal Harmony," *Canadian Music Educator*, 41 (2000): 65-70.

attractive as a visit to the dentist's. Somehow, aural needs to be more active, musically satisfying and supportive of related skills (theory, rehearsal technique) than that. Later in our UWA courses, harmony signing features in the pedagogy elements of undergraduate and graduate teacher education. Its influence is beginning to be detected in some of the schools where our alumni are teaching. A more widespread introduction of harmony signing awaits completion of a book on the approach, as well as the influence of publications such as the current article.

While the influence of Kodály, Dalcroze and other music educators on harmony signing is clear, the intention to extend such physically-based and creative practices 'upwards' into high school and college owes a great deal to the example of composer-educators such as R. Murray Shafer, Peter Maxwell Davies and Cornelius Cardew,⁹ concerned as they have been with the democratization of musical creativity. In addition, other less direct influences shaped the practice of harmony signing and the means by which it developed. The University of Reading hosted a degree in Theatre for the Deaf that provided compelling evidence of the expressivity and fluency with which hand movements can convey complex information.¹⁰ My concurrent research into the evolutionary origins of human musical behavior,¹¹ and their implications for pedagogy,¹² provided insights

⁹ A first full account of this movement is provided in: Jolyon Laycock, *A Changing Role for the Composer in Society* (2005).

¹⁰ This phenomenon is fully described in: Oliver Sacks, *Seeing voices: a journey into the world of the deaf* (1989).

¹¹ Nicholas Bannan, *op. cit.* (2003); see also: Stephen Brown, "Contagious heterophony: A new theory about the origins of music," *Musica Scientiae*, XI, (1), (2007): 3-26; Tecumseh Fitch, "The biology and evolution of music: A comparative perspective," *Cognition* 100 (2006): 173-215; Iain Morley, "Evolution of the physiological and neurological capacities for music," *Cambridge Archaeological Journal* 12 (2) (2002): 195-216; Björn Merker, "Synchronous chorusing and human origins," *The Origins of Music* (2000): 315-327.

¹² _____. "Gestural Language for the Representation and Communication of Vocal Harmony," *Canadian Music Educator*, 41 (2000a): 65-70; Nicholas Bannan, "Instinctive singing: lifelong development of 'the child within,'" *The British Journal of Music Education* 17 (3) (2000b): 295-301.

into what can be achieved musically in the absence of words;¹³ and this approach proved consistent with aspects of the music-analytical procedures devised by Schenker,¹⁴ not least, a critical stance regarding the wholesale reliance on electronic keyboards and computers as the premium resource for student-centered pedagogy, and especially for creative work in music, led to an evaluation of the importance of social and simultaneous interaction in developing musical awareness and fluency as an alternative to the isolating consequences of computer-based resources. While this may suggest a Luddite attitude to technology, this is far from the truth. Many aspects of harmony signing owe a great deal to previous work that employed electronic echo and reverberation as stimuli to children's vocal improvisation;¹⁵ and the realization that children and students rapidly acquire confidence in the use of TV remote controls and mobile phones without recourse to written instruction seemed consistent with the kind of hierarchical organization of symbolic processing that harmony signing was eventually to establish. In short, the approach was to exploit students' preference and capacity for learning by doing rather than through the second-hand abstractions of theoretical description.

Harmony signing was principally designed for students to employ: it is not a tool of instruction confined to the teacher. Its use is and has always been experimental. It represents a means of meaningfully re-introducing learning by discovery into a coherent framework that best supports musically satisfying results: in this respect, a significant aspect of the approach is motivational. In incorporating bodily movement into a social framework for musical participation and exchange, it seeks to re-activate the musical instincts with which each participant is born, and to extend these through play.

The foregoing represents a brief description of the processes by which harmony signing arose. What follows is set out in the form of an introductory tutor in the development of musical ideas that employ the harmony signing principles. Ironically, the written word is a poor medium for capturing these processes. In due course, the intention will be to publish a comprehensive guide to these techniques of teaching and learning in audio-visual format.

¹³ Nicholas Bannan, *op. cit.* (2005); see also Arnie Cox, "The mimetic hypothesis and embodied musical meaning," *Musica Scientiae* 5 (2) (2001): 195–212; Parsons, *op. cit.* (2001).

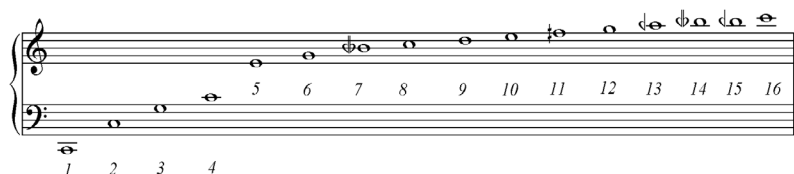
¹⁴ Heinrich Schenker, *Harmonie* [Harmony] (1906/1954).

¹⁵ Nicholas Bannan, "Aural feedback, vocal technique, and creativity," *The Phenomenon of Singing* (1998): 11–19.

THE FOUNDATIONS OF HARMONIC PERCEPTION

Harmony signing is first and foremost concerned with human responsiveness to consonance, which is taken to be fundamental to human perception.¹⁶ The harmonic series (Figure 1) which governs

Figure 1 - The Harmonic Series in Music Notation



The first four octaves of the harmonic series of the note C (the bottom note of the 'cello), which has a frequency (F_0) of 64Hz. The harmonics proceed (1st, 2nd, 3rd, 4th, etc.) as multiplications of the F_0 (64, 128, 192, 256Hz, etc.); while each whole-number division of the string (into $\frac{1}{2}$; $\frac{1}{3}$; $\frac{1}{4}$, etc.) produces the subsequent harmonic. The harmonics therefore become closer together in pitch, beginning with the largest (the octave between F_0 and the first overtone); and reducing to approximately a semitone between harmonics 15 and 16.

While the convergence of the harmonics in acoustic space may suggest that they become more easily confused, discrimination between them remains possible due to aural sensitivity to relative harmonicity. The simpler the ratio between pitches, the more consonant will be the sound and its resulting timbre; the more complex, the more dissonant. Thus the pitches of the series 1, 2, 4, 8, 16 are heard as so closely related that they are labelled as the *same note*, despite the fact that they are widely spaced in range – from a C at the bottom of the bass range of the human voice to one at the top of the soprano. Pitches of the series 1, 2, 3, 4, 5, 6, 8, 10, 12, 16 aggregate to make a consonant chord, as do any combinations of [1, 2, 4, 8 or 16] with [3, 6 or 12] and [5 or 10]. Pitches such as harmonics 7, 11, 13, 14 and 15 (which are hard to capture in equal-temperament music notation) have a less stable timbral relationship with F_0 and its closer relatives. The simpler the mathematical ratio between harmonics, the more closely related we perceive them to be.

¹⁶ Nicholas Bannan, *op. cit.* (2008).

what we discern as consonant or dissonant is a fact of nature, like the speed of light, the temperature of absolute zero, or the boiling point of water.

In turn, the harmonic series is both the basis of the vowel sounds we employ in language,¹⁷ and the foundation of our response to harmony, melodic contour and timbre in our engagement in music. Practicing the production of vocal harmonics is a valuable means of developing our aural capacities 'close to home' (Figure 2): if you can analyze your own voice with this level of skill, you are refining your hearing and setting up responses to intervals and harmony that will prove highly valuable as we employ them systematically in developing a scheme for understanding the use of harmonic conventions in music through harmony signing and related activities.

Figure 2 - Vowels as Harmonics

If we sing the following sequence of vowels on a sustained monotone, it should be possible to discern the rising harmonics that are associated with the formant frequencies to which each vowel gives rise (see Figure 1 for details). One should eventually perceive a kind of arpeggio made up of the intervals given in Figure 1.

oo – oa – or – o – ar – a – e – é – i – ee – ü

THE FOUNDATIONS OF MELODIC PERCEPTION

Speculation on the properties of generating distinct pitches from a sung monotone illustrates a chicken-and-egg paradox regarding the origins of music. Which came first, harmony or melody? Is harmony frozen melody? Or, is melody liberated harmony?¹⁸ Is

¹⁷ Nicholas Bannan, *op. cit.* (2008); see also Deborah Ross, Jonathan Choi and Dale Purves, "Musical intervals in speech," *Proceeding of the National Academy of Sciences*, 104 (2) (2007): 9852-9857.

¹⁸ Jean-Philippe Rameau, *Observations sur notre instinct pour la musique* (1754/1968); David Cohen, "The 'Gift of Nature': Musical 'Instinct' and Musical Cognition in Rameau," *Music Theory and Natural Order from the Renaissance to the Early Twentieth Century*. (2001): 68-92.

the diatonic scale the result of laying out the notes of the harmonic series in a 'best fit' order? Comparative ethnomusicology,¹⁹ taken together with experiments on the aural perception of non-human species including certain birds and monkeys,²⁰ would suggest that this is probably the case. So, we conventionally think in terms of scales as the sources of melody and harmony. The solfège system based on moveable Do that Kodály employed as the basis of his educational method is especially useful, and combines well with harmony signing. We, that is teachers and students together, need to be fluent in reading and responding instinctively to Kodály hand signs, and leading vocalization through employing them, if we are to explore the full potential of harmony signing.

INTRODUCING HARMONY SIGNING

We first create triads: working with scale degrees 1/3/5 (do/mi/sol) in three parts we can sign the tonic triad with the left arm held across the chest, fingers straight but relaxed. These can be sung to their Kodály names (do/mi/sol) or to numbers (1, 3, 5), though a better blend is achieved on a resonant <AH> vowel; and it helps to develop musically instinctive responses in group work of this kind if everyone is singing the same sound. It also needs to be performed with energy: participants need to feel the effect of the resonances, which tends only to become apparent above a dynamic of *mezzoforte*.

We can explore melody over this single chord; or over a drone made of either just the tonic note; or the tonic and fifth. An independent group of participants (or a soloist) performs melodic material in combination with the maintained harmonic background (Figure 3). Exploring the diatonic scale (e.g. with no accidentals) illustrates that the following intervals over the drone are stable and can be viewed as consonant: unison; third; fifth; octave. The second, fourth and sixth are unstable, mild dissonances that resolve by falling. The seventh is an acute dissonance that resolves by rising.

¹⁹ Constantin Brailouï, *Problems of Ethnomusicology* (1984); David Dargie, *Xhosa music: Its techniques and instruments, with a collection of songs* (1988).

²⁰ Anthony Wright et al., "Music perception and octave generalization in rhesus monkeys," *Journal of Experimental Psychology: General*, 129 (3): 291-307; Hollis Taylor, "Decoding the song of the pied butcherbird: an initial survey," *Transcultural Music Review* 12 (2008).

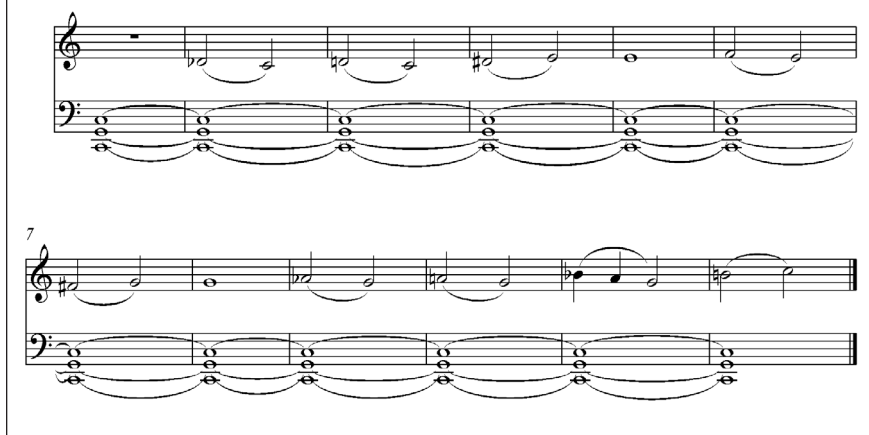
Figure 3 - An 'Alap' Exploring a Diatonic Scale Over a Drone



The remaining notes of the chromatic scale can also be explored in relation to these existing perceptions (Figure 4). The flattened second is an acute dissonance that resolves downwards: it features strongly in several exotic modes in, for instance, Greek and Jewish music as well as in the Neapolitan relationship. The flattened third can replace the normal major third presented by the harmonic series. The reverse of this, from minor to major, comprises the cadential device known as the *tièrce de Picardie* that is common in Medieval and folk music. Replacement of the major third by the minor produces a different tonal flavor we know as the minor mode (descended from the Aeolian mode), and the signature interval of the minor third, which features both in the tonic and subdominant chords, lends a different timbre to its principal harmonies. Sounded over the drone as in Figure 4, the flattened third demands upward resolution to the major third. This is characteristic of ragtime and some blues styles (e.g. the song "Stormy Weather"). The sharpened fourth (*diabolus in musica*) resolves upwards to the perfect fifth of the harmonic series in order to ward off evil spirits – which it does in melodies like "Maria" and "The Simpsons" but not in the music for Dracula films; or it undermines the tonic through implying a modulation to the dominant, of which it become the leading note. The flattened sixth falls to the fifth. In tonal music, the flattened seventh implies a replacement of the tonic triad, thus calling for modulation to the subdominant; or it falls by two steps via the sixth to the fifth in modal examples; or it can rise to the tonic in Dorian mode and Aeolian mode music such as written by Dvorak, Vaughan Williams, etc.

Working against a drone is an excellent way of evaluating the color and behavior of the different intervals that go to make up melodies; of experiencing these effects deeply and in practice so that students can learn to recognize them in dictation and transcription, and respond to their expressive qualities as a basis for their own interpretation while performing, as well as in improvisation and composition.

Figure 4 - An 'Alap' Exploring the Chromatic Scale Over a Drone



MOVING TO THE SUBDOMINANT

While much music around the world is based on an unchanging drone, the opportunity to introduce other chords that confer harmonic variety has its attraction. The logical place to move, as the first chord to introduce after the tonic, is the subdominant (IV), since this is the chord over which the tonic 'dominates'. Fig. 5 illustrates how to sign movement from the tonic to the subdominant, and the voice-leading consequences this has for participants.

Figure 5 - How to sign movement from the tonic to the subdominant

The signer moves from the horizontal position for the tonic to a vertical position pointing straight upwards.

Participants interpret the voice-leading implications as follows:

- 1 (Do) 'anchors' (elbow) – does not move
- 3-4 (Mi-Fa) rises only a semitone (wrist)
- 5-6 (Sol-La) rises a whole tone (fingertips)

This now gives us two chords, and therefore the capacity to perform a rudimentary progression: for example the accompaniment to the opening of "Chariots of Fire" (three beats on the tonic followed by one beat on the subdominant).

MOVING TO THE DOMINANT

Introducing the dominant completes the primary triads that are central to both art and popular music in the Western tradition, as well as to a great many styles that have developed around the world. Figure 6 illustrates how this is done for signer and participants:

Figure 6 - Introducing the dominant

The signer moves from the horizontal position for the tonic to a vertical position pointing straight downwards.

Participants interpret the voice-leading implications as follows:

- 5 (Sol) 'anchors' (elbow) – does not move
- 3-2 (Mi-Re) falls a whole tone (fingertips)
- 1(8)-7 (Do-Ti) falls only a semitone (wrist)

Notice that while in three vocal parts, which is all we have covered so far (though any part may be doubled at the octave, especially where this is suitable for mixed male and female voices), we can relate to a pattern of voice-leading that has consequences that can become familiar as a key to more complex relationships that this will prepare us to recognize and respond to instinctively. While employing just the three primary triads in this way:

When moving to and from the tonic, there is always one anchor note (i.e. a part that remains the same); one part that moves a semitone; and one part that moves a whole tone;

In whatever inversion (see below) the tonic is first presented, the three chords of the tonic, dominant and subdominant will emerge such that one is in root position, one in first inversion, and one in second inversion.

Recognizing the consequences of these two patterns of voice-leading needs to become second nature, especially as a basis for confidence and accuracy in modulation (see below).

WORKING WITH THE THREE PRIMARY TRIADS: TONIC-SUBDOMINANT-DOMINANT

We can now improvise and compose with the three chords whose relationships we have mastered both as signers and participants; plenty of great music is limited to this selection. For example, we can put together a boogie-woogie blues (Fig 7); or, through applying rhythmic patterns to the pitches sung, a version of the song *Wimoweh*, or perform the accompaniment to the openings of Bernstein's "One Hand, One Heart" or Schumann's "Seit ich ihn gesehen" (No. 1 of the song-cycle *Frauenliebe und Leben*). These examples require us to employ the chords according to a *harmonic rhythm*, or rate of chord-change, and to articulate rests as well as differences between legato and disjunct continuity. Thus through using the right hand as a conductor would do to sign cues and cut-offs, we have a wide range of harmonic patterns we can devise and through which we can become familiar with the potential of this foundational level of harmony signing. An important step in consolidating what has been learned so far is that every participant have the opportunity to improvise in leading the group with these available resources: three chords; and the capacity to alternate them with silence.

Inverting Chords

However, it's still the same three chords, which means the performers get stuck with the same old notes until someone lets them swap parts with each other, and, because of the voice-leading principle at work, a fixed sequence whereby each chord is locked into a particular inversion. The next step is to free up this fixed position in which everything derives from the original tonic in root position. We can take harmony signing into a new dimension of range and texture by developing the use of inversions.

The sign for inverting is exhibited in the right hand, and is quite distinct from any of the Kodály hand signs or any harmony signing gestures encountered so far. It has the right hand palm facing upwards as if carrying drinks on a tray. Participants respond to changes of inversion signaled as rising or falling shapes by moving to the next available note of the same chord that they are already singing. This is absolutely dependent for its success on everyone listening carefully to the harmony that is already present.

A useful exercise for developing confidence in participants with the vocal requirements of responding to inversion is the “Quixote gesture,” named after Cervantes’s fictional Spanish knight who attacked the windmills. This exercise allows participants to locate in their own time and according to their own vocal range the different notes of a chord that is being sung: the signer makes a revolving windmill gesture with the right hand, and singers move in whatever way they like to as many notes as they want of the prevailing chord. It is a good idea to do this slowly at first, rather than through wild arpeggios, so that the balance and blend of harmony can be retained, and singers become adept at changing notes while continually listening to the overall effect. Again, this can play a significant part in priming the kind of instinctive response whereby participants sing the right notes without always knowing why.

Once participants and signers have made progress with these ideas, some available patterns worth trying first would be:

- Sing tonic; invert tonic up; return to original position;
- Sing tonic; move to subdominant; invert subdominant; return to original subdominant; return to original tonic;
- Sing tonic; invert tonic up; return to original position; move to subdominant; invert subdominant; return to original subdominant; return to original tonic; move to dominant; invert dominant upwards; return to original dominant; return to tonic.

These routines are vital in establishing aurally and practically the important contrasts between:

- (i) different inversions of the same chord;
- (ii) different chords in the same inversion.

Freeing Up the Chords: Towards Polyphony

We have concentrated so far on developing a scaffold for harmonic progression with the elements of the primary triads and their various inversions. Before moving on to further harmonic elaboration, we can consolidate our experiences through combining harmony on these lines with independent melody lines. This is achieved through employing Kodály hand signs in the right hand. There are two principal means of developing this:

- (i) 'Capturing' notes contained in chords and 'liberating' the part singing from harmonic duties so as to explore features such as suspensions, anticipations, and melodic decoration.

To achieve this, the signer presents a sign for a chord – say the tonic. He or she then signs with the right hand one of the notes contained in that triad – let's say it is the third. All participants who had been singing the third of the original chord now follow whatever melodic roles the signer requires; while all other participants continue to follow the harmonic patterns signed as normal in the signer's left arm. According to whether the signer decides that 'melody' or 'harmony' moves first, suspension and anticipation can be modelled; and free melodic journeys can be controlled for the 'captured' voice-part while the skeletal harmony continues to be provided by everyone else.

- (ii) Moving an independent melody part against chords. This is achieved by splitting the performers into four parts: three harmony parts who follow the left arm harmony signing as normal; and an additional melody part that follows Kodály hand signs given in the leader's right hand. The following examples have proved effective at this stage, giving opportunities for leaders to sign both melody and harmony simultaneously:

- Vangelis: *Chariots of Fire* (opening)
- *Wimoweh*
- Gruber: *Silent Night*
- Chopin: *Étude in E Major*, Op. 10 No. 3 (opening)

WIDENING THE HARMONIC PALETTE: THE SECONDARY TRIADS

Conventional harmony textbooks present the secondary triads as being, in comparison with the primary triads, the 'leftover' or weaker chords that are formed on positions II (the supertonic), III (the mediant) and VI (the submediant). What their incorporation into harmony signing procedures makes explicit is that each has a dependent relationship with its relative primary triad in terms

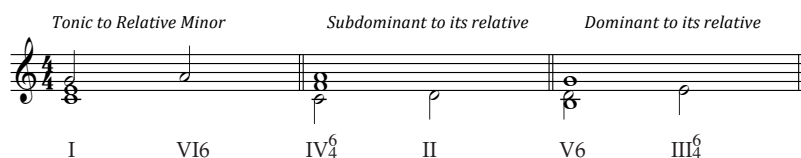
of both generation and its implications for the voice-leading that connects all these chords together in a logical framework (Fig. 8).

Where the signs for primary triads involve a flat, extended hand, the determining feature of the sign for the secondary triads is a clenched fist. Movement from each primary triad to its relative secondary triad involved two anchor-voices while one part rises a tone:

- The signer moves from the tonic to the submediant chord by curling the fingers into a fist and simultaneously moving the whole arm a little to the right. This signals that anyone singing the fifth moves to the sixth;
- The signer moves from the subdominant to the supertonic chord by curling the fingers into a fist and simultaneously moving the whole arm a little higher in the air. This signals that anyone singing the tonic moves to the second;
- The signer moves from the dominant to the mediant chord by curling the fingers into a fist and simultaneously lifting the whole arm a little higher in the air. This signals that anyone singing the supertonic moves to the mediant.

In all cases, the root of the chord (irrespective of what inversion is being sung) is the note that is introduced, and it is arrived at by step from the fifth note of the relative primary triad.

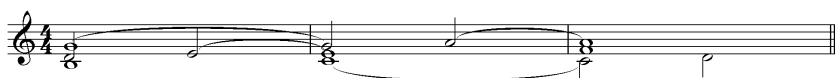
Figure 8 - The Relationship Between Primary and Secondary Triads



Once these new chords have become familiar, the whole array of six chords can be employed freely (see Figure 9). Exercises should include the inversion of the chords, and their combination with melodies as proposed above. In voice-leading terms, a great deal of useful experience should have been gained in forming and deploying chords in improvised progressions that provide a valuable

framework for understanding diatonic harmony. However, by this stage the somewhat unstable and superficial character of harmony limited to three parts will have become apparent. There is a need to provide bass notes in order to achieve root position completion of, especially, the secondary triads.

Figure 9 - A Progression Involving All Six Triads



GETTING INTO FOUR PARTS

Initially, the participants can be divided into four groups, of which one is selected to provide the bass. This need not be restricted to lower voices – especially in mixed groups, it is important to revolve roles. Irrespective of considerations of range, female singers need as much experience of providing bass functions as male. As part of an aural development exercise, there is no harm in having parts doubled at the octave, as will have been the case already.

The role of the new group is to provide the root of any chord signed. An exercise that demands this is the opening of Pachelbel's *Canon*. While the chords are signed with the left hand (see above), their roots are conveyed in Kodály hand signs with the right hand:

I – V – VI – III – IV – I – IV – V – I

Once all participants have taken a turn at singing root bass notes, it becomes possible to develop more sophisticated bass lines by employing Kodály hand signs in the right hand to signal bass notes; as with combining melody and harmony, these can be freely signed so as to develop passing notes, arpeggiation, etc.

CONCLUSIONS

The material covered so far represents the initial diatonic application of harmony signing. This level of operation can be achieved by students from about seven years of age upwards. But it has proved especially valuable in collegiate institutions as a means of establishing confidence and practical capacity to deal with these phenomena for students who arrive with insufficient theoretical or musical experience to achieve these functions, or whose previous experience of music-making has been achieved where manual manipulation of instruments has become detached from creative, experimental or discriminating exploration of the relationships between sounds. Interviewing students and observing lessons on three continents has confirmed that aural development is often taught solely through testing, with few strategies provided that deal with students' fears and frustrations.

Space precludes illustrating in detail where harmony signing goes from here. But a considerable amount of freer and more complex material can build on the foundations presented above. A recent workshop in Beijing covered all this material and went on to deal with chromatic alterations (making major chords minor; the diminished triads; adding dominant 7ths) and introducing modulation (to the subdominant using the flattened 7th; to the dominant using the sharpened 4th; to the relative minor, using the sharpened 5th; tonicizing through confirming modulations and/or 'coming home'). Students at UWA have experimented with two-handed Kodály signing as a means of conveying improvised exercises in two-part species counterpoint. The project is a work-in-progress responsive to the needs of students as much as to the semantic space remaining to be effectively exploited within the system. What is increasingly apparent is that harmony signing makes a valuable contribution to student learning, creativity and understanding precisely because it employs action rather than words.

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