

APPENDIX I

Chord Construction

Harmony, *Counterpoint*, *Partimento* has so far offered little information about chord construction. (The main exceptions to this are the diminished seventh chord and the augmented fifth triad, since the interval structure of both chords is the basis of their enharmonic potential.) The reason for this omission is the horizontal perspective that is present in all chapters. Chords have mostly been presented as the result of the simultaneous movement of voices. Notwithstanding this approach a concise exploration of chord construction seems appropriate. This depends largely on two aspects.

First, chords are determined by the constitution of intervals. For instance, the $\frac{6}{3}$ chord consists of a third and a sixth. Second, chords are determined by the type of their inherent intervals. For instance, the major $\frac{5}{3}$ chord consists of a major third and a perfect fifth, the dominant seventh chord of a major $\frac{5}{3}$ chord and a minor seventh, and so forth. The interval and chord types depend entirely on their position within the scale, if we leave to one side chromatic alterations.

Finally, chords can be inverted, for instance by means of invertible counterpoint or by a mere shuffling of chord tones. In Chapter 6 the concept of chord families was introduced in order to unify chords that are related by means of inversion in whatever way.

Below we will systematically examine this vertical aspect of harmony, starting with two-part intervals and continuing with three- and four-part chords.

HARMONIC INTERVALS

Example I.1 shows the thirds and sixths on the different degrees of the major and minor scales. The sixths on the lower staff can be conceived as inversions of the thirds on the higher staff and vice

EXAMPLE I.1 Major and minor thirds and sixths in major (a) and minor (b)

a. C major

b. A minor

versa, by means of invertible counterpoint. The letters “M” and “m” stand for major and minor, respectively.

- The major scale regulates the interval types: the first scale degree (C) supports a major third, the second scale degree (D) a minor third, and so on. On the lower staff the thirds are inverted into sixths. Note that the inversions change the interval types: a major third becomes a minor sixth and a minor third a major sixth.
- The same applies to the minor scale. The example shows the intervals that are based on the melodic scale, with the raised $\hat{6}$ and $\hat{7}$ (F \sharp and G \sharp). Evidently, the harmonic and natural scales generate different interval types.

Comparable series can be made using seconds and sevenths, or fourth and fifths. Most seconds are major or minor. The inversion of a major second results in a minor seventh, and the inversion of a minor second in a major seventh. The augmented second occurs between $\hat{6}$ and $\hat{7}\sharp$ of the harmonic scale (F and G \sharp in A minor); its inversion is the diminished seventh.

Most fourths are perfect; they can be inverted into perfect fifths. The major scale includes an augmented fourth or diminished fifth between $\hat{4}$ and $\hat{7}$, and the harmonic minor scale between $\hat{4}$ and $\hat{7}\sharp$ and between $\hat{2}$ and $\hat{6}$.

EXAMPLE I.2 Augmented and diminished intervals with their resolutions

a. C major/ A minor

b. A minor

c.

Example I.2 shows the augmented and diminished intervals in the major and (harmonic) minor modes with their resolutions. The letters “d”, “A”, and “P” stand for diminished, augmented, and perfect, respectively.

- In C major the diminished fifth B–F resolves into the major third C–E. Its inversion, the augmented fourth F–B, resolves into the minor sixth E–C. In general, these progressions consist of the voice-leading patterns $\hat{7} - \hat{1}$ and $\hat{4} - \hat{3}$. The intervals occur in A minor too; if so, the progressions consist of the patterns $\hat{2} - \hat{3}$ and $\hat{6} - \hat{5}$.

- b. In A minor the diminished fifth $G^\sharp-D$ resolves into the minor third $A-C$, and the augmented fourth into the major sixth $C-A$. The voice-leading patterns are $\hat{7}^\sharp-\hat{1}$ and $\hat{4}-\hat{3}$.
- c. In A minor the diminished seventh $G^\sharp-F$ resolves into the perfect fifth $A-E$, and the augmented second $F-G^\sharp$ into the perfect fourth $E-A$. The voice leading patterns are $\hat{7}^\sharp-\hat{1}$ and $\hat{6}-\hat{5}$.

Not all possible intervals in the minor mode are mentioned here, for instance the diminished fourth between $\hat{7}^\sharp$ and $\hat{3}$ ($G^\sharp-C$ in A minor) or the augmented fourth between $\hat{3}$ and $\hat{6}^\sharp$ ($C-F^\sharp$ in A-minor). The existence of three versions of the minor scale, namely harmonic, melodic, and natural, brings forth many possibilities.

Chromatic tones produce new intervals. Among these the augmented sixth and its inversion, the diminished third, should be mentioned; see example I.3.

EXAMPLE I.3 The augmented sixth and the diminished third with their resolutions

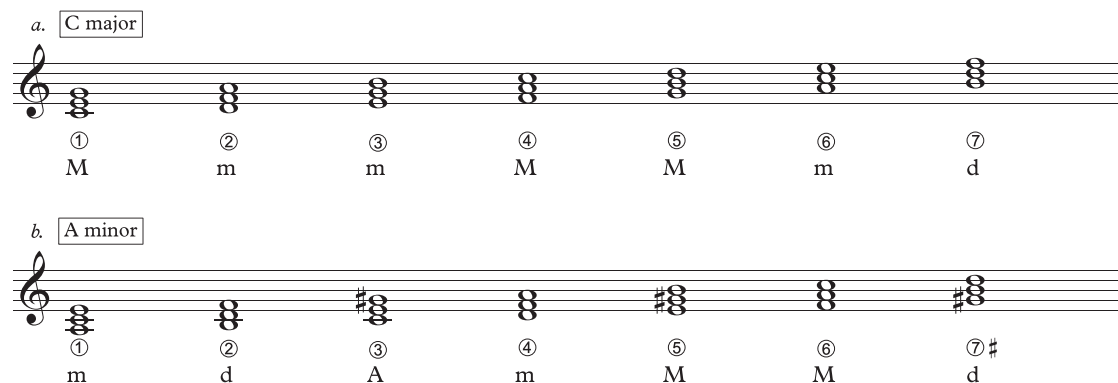


The augmented sixth $F-D^\sharp$ in A minor arises from the chromatic alteration of D to D^\sharp ($\hat{4}^\sharp$). The dissonant interval resolves into the octave. Its inversion, the diminished third, resolves into the unison.

TRIADS

Triads are constitutions of three intervals. For instance, the major triad $C-E-G$ in close position contains the major third $C-E$, the minor third $E-G$, and the perfect fifth $C-G$. The diatonic major and minor scales include four different types of triad: major (M), minor (m), diminished (d), and augmented fifth (A).

EXAMPLE I.4 Triads in major (a) and minor (b)



Example I.4 shows the triads that occur in the C major and the harmonic A minor scales. Each triad type is determined by its position in the scale. Evidently, the different versions of the minor scale generate different types. For the sake of simplicity, the melodic and natural minor scales are left to one side.

- a. The major scale generates major, minor, and diminished triads. Major triads occur on ①, ④, and ⑤, and consist of a major and a minor third (bottom-up) and a perfect fifth. Minor triads occur on ②, ③, and ⑥, and consist of a minor and a major third (bottom-up) and a perfect fifth. The diminished triad occurs on ⑦, with two minor thirds and a diminished fifth.
- b. The given triads arise from the harmonic scale. Minor triads occur on ① and ④, major triads on ⑤ and ⑥, diminished triads on ② and ⑦ \sharp , and the augmented fifth triad on ③. As has been mentioned, the melodic and natural minor scales produce different triads. For instance, the natural scale contains major triads on ③ and ⑦ \natural .

EXAMPLE I.5 Triad families: major (a), minor (b), diminished (c), and augmented fifth (d)

Example I.5 displays four triad families, each shown in three positions (root, first inversion, and second inversion) on a treble clef staff. The triads are labeled (a) through (d).

- (a) Major triad:** C-E-G. Chord symbols: $\frac{5}{3}$, $\frac{6}{3}$, $\frac{6}{4}$.
- (b) Minor triad:** C-E \flat -G. Chord symbols: $\frac{5}{3}$, $\frac{6}{3}$, $\frac{6}{4}$.
- (c) Diminished triad:** C-E \flat -G \flat . Chord symbols: $\frac{5}{3}$, $\frac{6}{3}$, $\frac{6}{4}$.
- (d) Augmented-fifth triad:** C-E \sharp -G. Chord symbols: $\frac{5}{3}$, $\frac{6}{3}$, $\frac{6}{4}$.

Example I.5 shows the four types of triad as they occur in example I.4, each in three different positions. For the sake of comparison all $\frac{5}{3}$ chords are built on C. According to the concept of chord inversion, each $\frac{5}{3}$ chord is the root position, each $\frac{6}{3}$ chord its first inversion and each $\frac{6}{4}$ chord its second inversion. Consequently, the root (or fundamental) of the $\frac{5}{3}$ chord is also the root of the $\frac{6}{3}$ and $\frac{6}{4}$ chords. Although the method presented in this book takes a cautious stance with regard to chord inversion, the concept explains the similarity in sound between, say, the $\frac{5}{3}$ chord on ① and the $\frac{6}{3}$ chord on ③. For this reason the method introduces the concept of chord families. The chords in black notes add open (or spread) chord positions to the basic chords in close position.

- a. The family of the major triad C–E–G. The family occurs as I in C major, IV in G major and V in F major on the one hand, and as V in F minor and VI in E minor (referring to the harmonic scale) on the other.
- b. The family of the minor triad C–E \flat –G. The family occurs as ii in B \flat major, iii in A \flat major and vi in E \flat major on the one hand, and as i in C minor and iv in G minor on the other.

- c. The family of the diminished triad C–E \flat –G \flat . The family occurs as vii $^\circ$ in D \flat major, and as ii $^\circ$ in B \flat minor and vii $^\circ$ in D \flat minor.
- d. The family of the augmented fifth triad C–E–G \sharp . The family occurs as III $^+$ in A minor.

The inclusion of chromatic tones, the molldur $\hat{6}$ in the major scale and the Neapolitan $\hat{2}$ in the minor scale, generate different chord families. One of these altered chords, the augmented $\frac{6}{3}$ chord, needs to be mentioned here.

EXAMPLE I.6 The augmented $\frac{6}{3}$ chord in minor (a) and major (b)

The image shows two musical staves. Staff (a) is for A minor, showing an augmented $\frac{6}{3}$ chord on the sixth degree (F \sharp). The notes are F \sharp (bass), A (middle), and D \sharp (treble). Oblique lines indicate the resolution of F \sharp to E and D \sharp to E. Staff (b) is for C major, showing an augmented $\frac{6}{3}$ chord on the lowered sixth degree (F \flat). The notes are F \flat (bass), A \flat (middle), and D \sharp (treble). Oblique lines indicate the resolution of F \flat to G and D \sharp to G.

Example I.6 shows the augmented $\frac{6}{3}$ chord. Its progression to the dominant $\frac{5}{3}$ chord is based on the resolution of the augmented sixth into the octave; see the oblique lines. The notes in cue size show the chord in open position. Theoretically speaking, the augmented $\frac{6}{3}$ chord forms a chord family together with its related $\frac{5}{3}$ and $\frac{6}{4}$ positions. In practice, however, these positions are so rare that they do not need to be mentioned here.

- a. The augmented $\frac{6}{3}$ chord on $\textcircled{6}$ in A minor. The chord arises through the chromatic $\hat{4}\sharp$ (D \sharp); see also example I.3. The major third F–A complements the chord. The augmented sixth F–D \sharp resolves into the octave E–E and the augmented fourth A–D \sharp into the minor sixth G \sharp –E.
- b. The augmented $\frac{6}{3}$ chord on $\textcircled{6}\flat$ (molldur) in C major. The chord arises through the twofold alteration $\hat{4}\sharp$ (F \sharp) and $\hat{6}\flat$ (A \flat). The augmented sixth A \flat –F \sharp resolves into the octave G–G and the augmented fourth C–F \sharp into the minor sixth B–G.

SEVENTH CHORDS

Traditionally, seventh chords are presented as triads with an added seventh. For instance, the dominant seventh chord consists of a major triad and a minor seventh. Aside from the dominant and the diminished seventh chords, this book treats the seventh almost always as a suspension. Nevertheless, an understanding of the construction and a certain sensitivity to the sounds of the seventh chords belong to standard theoretical knowledge.

Example I.7 shows the five different seventh-chord types in the major and minor mode: major (M), minor (m), dominant (D), half-diminished (hd), and diminished (d).

EXAMPLE I.7 Seventh chords in major (a) and minor (b)

a. C major

① M ② m ③ m ④ M ⑤ D ⑥ m ⑦ hd

b. A minor

① m ② hd ③ M ④ m ⑤ D ⑥ M ⑦# d

- a. The major mode generates major, minor, dominant, and half-diminished seventh chords. Major seventh chords occur on ① and ④, and consist of a major triad and a major seventh. Minor seventh chords occur on ②, ③, and ⑥, and consist of a minor triad and a minor seventh. The dominant seventh chord occurs on ⑤, and consists of a major triad and a minor seventh. The half-diminished seventh chord occurs on ⑦, and consists of a diminished triad and a minor seventh.
- b. In the minor example the seventh chords on ① and ③ stem from the natural scale, since these chords rarely contain a $\hat{7}^\#$ ($G^\#$ in A minor). The chords on ⑤ and ⑦ $^\#$ are taken from the harmonic scale. Minor seventh chords occur on ① and ④, major seventh chords on ③ and ⑥, the half-diminished seventh chord on ②, the dominant seventh chord on ⑤, and the diminished seventh chord on ⑦ $^\#$. The diminished seventh chord consists of a diminished triad and a diminished seventh. Once more, the harmonic, melodic, and natural scales produce different seventh chords.

EXAMPLE I.8 Seventh-chord families: major (a), dominant (b), minor(c), half-diminished (d), and diminished (e)

a. major seventh chord

b. dominant seventh chord

c. minor seventh chord

d. half-diminished seventh chord

e. diminished seventh chord

Example I.8 shows the five types of seventh chord, as they occur in example I.7, each in four different positions. For sake of comparison all $\frac{7}{3}$ chords are built on C. The concept of chord

inversion postulates that each $\frac{7}{3}$ chord is the root position, each $\frac{6}{3}$ chord the first inversion, each $\frac{4}{3}$ chord the second inversion, and each $\frac{6}{2}$ the third inversion. Consequently, the root of the $\frac{7}{3}$ chord is also the root of the $\frac{6}{3}$, $\frac{6}{4}$, and $\frac{4}{2}$ chords.

- The family of the major seventh chord C–E–G–B. The family occurs as I in C major and IV in G major on the one hand, and as III in A (natural) minor and VI in E (harmonic) minor on the other.
- The family of the dominant seventh chord C–E–G–B \flat . The family occurs as V in F major and F minor.
- The family of the minor seventh chord C–E \flat –G–B \flat . The family occurs as ii in B \flat major, iii in A \flat major, and vi in E \flat major on the one hand, and as i in C (natural) minor and iv in G minor on the other.
- The family of the half-diminished seventh chord C–E \flat –G \flat –B \flat . The family occurs as vii $^\circ$ in D \flat major and ii $^\circ$ in B \flat minor.
- The family of the diminished seventh chord C–E \flat –G \flat –B $\flat\flat$. The family occurs as vii $^\circ$ in D \flat minor. (The more usual notation is B \sharp –D \sharp –F \sharp –A in C \sharp minor.)

Chromatic alterations produce new seventh chords. Among them the augmented $\frac{6}{3}$ and the augmented $\frac{4}{3}$ must be mentioned. These chords are closely related to the aforementioned augmented $\frac{6}{3}$ chord. Example I.9 illustrates this.

EXAMPLE I.9 The augmented sixth chords in minor (a) and major (b)

The example shows two musical staves. Staff (a) is for A minor and staff (b) is for C major. Each staff contains three augmented sixth chords. Below each staff, the chords are identified by their figured bass notation: $\frac{6\sharp}{3}$ (6), $\frac{(5)}{3\sharp}$ (5), $\frac{6\sharp}{3}$ (6), $\frac{5}{3\sharp}$ (5), $\frac{6\sharp}{4\sharp}$ (6), and $\frac{5}{3\sharp}$ (5). In staff (b), the chords are $\frac{6\sharp}{3}$ (6 \flat), $\frac{(5)}{3}$ (5), $\frac{6\sharp}{3\flat}$ (6 \flat), $\frac{5}{3}$ (5), $\frac{6\sharp}{4\sharp}$ (6 \flat), and $\frac{5}{3}$ (5).

All three augmented sixth chords arise from the alteration $\hat{4}^\sharp$, and are based on the resolution of the augmented sixth into the octave; see the oblique lines.

- The augmented $\frac{6}{3}$, $\frac{6}{3}$, and $\frac{4}{3}$ chords in A minor. All chords occur on $\textcircled{6}$. The $\frac{6}{3}$ chord adds a perfect fifth (F–C) to the $\frac{6}{3}$ chord, and the $\frac{4}{3}$ an augmented fourth (F–B).
- The augmented $\frac{6}{3}$, $\frac{6}{3}$, and $\frac{4}{3}$ chords in C major. All chords occur on $\textcircled{6}^\flat$ (molldur). The perfect fifth (A \flat –E \flat) in the $\frac{6}{3}$ chord also hints at the parallel minor key: like the A \flat , the E \flat may be regarded as molldur. The augmented sixth chords stem from the minor mode so to speak, but can be applied throughout in the major mode.