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## ON HARMONIC ANALYSIS



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This text is mainly about harmony and harmonic analysis - though other aspects of analysis are mentioned too, along the line. It is possible (probable even) that you are informed about some topics in this text. I am mentioning these things mainly for the sake of some completeness.

Since around 1600, in most compositions *chords* are used: triads and seventh chords. In other words: the *harmony* plays an important role. In a harmonic analysis observations can be made about the relations between chords, and about their place in the key(s). It may also be important to look for relations between the harmony and other aspects of a composition, like the melody or melodies, the phrases, the form, and the meter and rhythm.

Some tones in tonal music are part of the melody, but not of the harmony; these tones are called *embellishment tones*.<sup>1</sup> And in most tonal music the harmony is *layered*, meaning that not all chords are equally 'important': we can distinguish between *structural* and *non-structural chords*.<sup>2</sup>

When making harmonic analyses you could use several techniques, such as:

- **analysis** of the **degrees**: the harmony of a composition is described using Roman numerals for the scale degrees;<sup>3</sup> the inversions of the chords can be added. Instead of Roman numerals sometimes **chord symbols** are used.<sup>4</sup>
- **harmonic reduction**: the score is 're-written' in such a way, that only, or mainly, the harmony is visible. Of course, this technique may be combined with an analysis of the scale degrees.<sup>5</sup>
- **harmonic/melodic reduction**: usually the score is 're-written' in such a way, that only, or mainly, the (most important) tones of the *bass* and the *upper voice* are shown. An analysis of the scale degrees may be added.

When making, or reading and understanding, an harmonic analysis it is necessary to be aware of the *meaning* of the chords, mentioned in the analysis. Sometimes the meaning of a chord, or a group of chords, is clear through description with a Roman (scale degree) numeral(s), sometimes it makes sense, or turns out to be necessary, to add further explanation or interpretation to a scale degrees analysis (or to a reduction).

### **degrees and functions; main degrees and secondary degrees**

Every tone of a minor or major key has its own character, and therefore plays specific roles in a piece of music (and doesn't play certain other roles). A quite obvious example is the leading tone in the major and harmonic minor keys: usually it resolves to the root of the key. Another - maybe less obvious - example is the sixth in the major and (harmonic) minor keys: this tone often leads down, to the fifth of the key. In tonal music, such 'roles' are determined by the *audible relation with the root of the key*: the presence of this root creates the possibility for a certain tone to play specific roles.

For triads and seventh chords applies the same, more or less. For instance: a chord that contains the leading tone, logically is followed by a chord in which the root of the key plays an important role. The role of a chord often can be described even more precisely than the role of a single tone: the *combination* of three or four tones (and therefore: the combination of several 'roles') clarifies the status of the chord they are forming.

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1 Further explanation: see the chapter *embellishing tones (passing tone, neighbouring tone, suspension, anticipation)*

2 Further explanation: see the chapter *structural and non-structural harmony / faux-bourdon / pedal point*. We can also speak of structural and non-structural *harmony*.

3 For an explanation see the section *degrees and functions; main degrees and secondary degrees* below.

4 The use of chord symbols is common practice when describing Jazz music, for instance. Chord symbols are also sometimes practical in the description of music of the twentieth century.

5 Some examples of harmonic reduction you can find in my text "*An example of sonata-rondo: Beethoven, sonata in c minor op. 13 (Pathétique), third movement...*" (from page 4).

On every tone of the major and minor keys a chord (triad or a seventh chord) can be placed.<sup>6</sup> Such a *chord on a tone of a key* is called: **degree**. There are seven degrees, as many as there are tones in the key. Degrees can be 'labelled', using Roman numerals. For example: III means: the triad on the third tone of the key, IV7 means: the seventh chord on the fourth tone, I6 means the triad on the first tone, in first inversion.

Degrees differ of course, because they are on different tones of the key (and thus consist of different tones), but they differ above all because of their different *sound*:

1. in a **major key** the triads on I, IV and V are major ; the triads on II, III and VI are minor; the only diminished triad is on VII.
2. in a **minor key** the triads on I and IV are minor; the triad on V normally is major - because of the use of the (artificial) *leading tone* in minor keys<sup>7</sup> In the so-called **natural minor** key the triad on V *is minor*. On III<sup>8</sup> and VI stand major triads, and on II and VII usually diminished triads. The use of the leading tone is causing the diminished triad on VII: in the natural minor key the triad on VII is major.

The minor key is *more complex* than the major key: in fact a minor key consists of nine tones, as (often) the seventh and (less often) the sixth tone may be raised:<sup>9</sup>

1    2    3    4    5    6    6#    7    7#

Therefore, in the *minor key* in principle more different chords are possible than in the major key. A schematic overview of the degrees (triads) in the major and (harmonic) minor keys:

(Maj = major    min = minor    dim = diminished)	<b>major:</b>	[VI]	[VII]	I	II	III	IV	V	VI	VII
		[min]	[dim]	Maj	min	min	Maj	Maj	min	dim
	<b>minor:</b>	I	II	III	IV	V	VI	VII	[I]	[II]
		min	dim	Maj	min	Maj	Maj	dim	[	min [dim]
									]	

As a music example: *example 1*

maj=major    min=minor    dim=diminished

D major

I<sub>maj</sub>

II<sub>min</sub>

III<sub>min</sub>

IV<sub>maj</sub>

V<sub>maj</sub>

VI<sub>min</sub>

VII<sub>dim</sub>

B minor (harmonic)

I<sub>min</sub>

II<sub>dim</sub>

III<sub>maj</sub>

IV<sub>min</sub>

V<sub>maj</sub>

VI<sub>maj</sub>

VII<sub>dim</sub>

In the above schedule is visible that the chords in a major and its relative minor key almost completely correspond: the minor key is a minor third below its relative major key, and consists basically of the same tones. For example, an E minor triad can be used as II in D major, but also as

6 Chords might also be placed on some *raised* or *lowered* tones. I am disregarding these possibilities here.  
7 The so-called *harmonic* minor scale  
8 In a minor key, when the leading tone is used, III appears as an **augmented** triad. III as an augmented triad is much less common than III as a major triad - and for that reason only the major triad is mentioned in the schedule.  
9 It is common practice to speak of *harmonic* minor (minor scale with raised 7), and of *melodic* minor (minor scale, using raised 6 and 7 when going up, and using 'natural' 6 and 7 when going down). In practice we observe 'mixed use' of these scales though. Therefore they can be considered as merely theoretical 'constructions'.

IV in B minor; a D major triad can be used as I in D major, but also as III in B minor, etc. As normally the leading tone is used in V and VII in a minor key, these degrees differ from III and V in the relative major key (in example 1: A#). The degrees of a major key correspond exactly with the degrees of its 'natural' minor relative:

	majeur:	[VI]	[VII]	I	II	III	IV	V	VI	VII
(Maj = major min = minor dim = diminished)		[min]	[dim]	Maj	min	min	Maj	Maj	min	dim
	natuurlijk mineur:	I	II	III	IV	V	VI	VII	[I]	[II]
		min	dim	Maj	min	min	Maj	Maj	[min]	[dim]

As a music example: *example 2*

maj=major min=minor dim=diminished

D major

I<sub>maj</sub> II<sub>min</sub> III<sub>min</sub> IV<sub>maj</sub> V<sub>maj</sub> VI<sub>min</sub> VII<sub>dim</sub>

B minor ('natural')

I<sub>min</sub> II<sub>dim</sub> III<sub>maj</sub> IV<sub>min</sub> V<sub>min</sub> VI<sub>maj</sub> VII<sub>maj</sub>

Degrees can also be used in the form of *seventh chords*. Below is a list of the most common seventh chords in major and (harmonic) minor keys:

	majeur:	[VI <sup>7</sup> ]	[VII <sup>7</sup> ]	I <sup>7</sup>	II <sup>7</sup>	III <sup>7</sup>	IV <sup>7</sup>	V <sup>7</sup>	VI <sup>7</sup>	VII <sup>7</sup>
(Maj = major min = minor dim = diminished dom = dominant seventh chord hfdim = half diminished)		[min]	[hfdim]	Maj	min	min	Maj	dom	min	hfdim
	harm. mineur:	I <sup>7</sup>	II <sup>7</sup>	III <sup>7</sup>	IV <sup>7</sup>	V <sup>7</sup>	VI <sup>7</sup>	VII <sup>7</sup>	[I <sup>7</sup> ]	[II <sup>7</sup> ]
		min	hfdim	Maj	min	dom	Maj	dim	[min]	[hfdim]

As a music example: *example 3*

maj=major min=minor dim=diminished  
hfdim=halfdiminished dom=dominant seventh

D major

I<sup>7</sup><sub>maj</sub> II<sup>7</sup><sub>min</sub> III<sup>7</sup><sub>min</sub> IV<sup>7</sup><sub>maj</sub> V<sup>7</sup><sub>dom</sub> VI<sup>7</sup><sub>min</sub> VII<sup>7</sup><sub>hfdim</sub>

B minor (harmonic)

I<sup>7</sup><sub>min</sub> II<sup>7</sup><sub>hfdim</sub> III<sup>7</sup><sub>maj</sub> IV<sup>7</sup><sub>min</sub> V<sup>7</sup><sub>dom</sub> VI<sup>7</sup><sub>maj</sub> VII<sup>7</sup><sub>dim</sub>

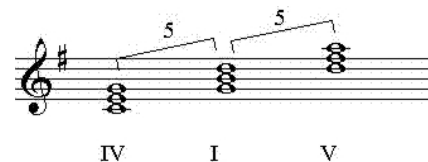
The term **function** is used to describe which *role(s)* a chord plays in a piece of music. We distinguish three functions: **tonic**, **dominant** and **subdominant** (abbreviated: T, S and D). Each chord in a piece of music has one of these three functions. Some chords always have the same function, others may have different functions, and can therefore play different roles, depending on the context.

The seven degrees of the major and minor keys can be divided in **main degrees** and **secondary degrees**. Main degrees are functionally clearer than secondary degrees. The main degrees are: I, IV en V ; the function of I is: tonic ( I can be considered as the 'central chord' in a tonal piece, because it stands on the root of the key); the function of IV is subdominant, and the function of V is: dominant.

The role of the *fifth* in the harmony of tonal music probably is the main reason that I, IV and V can be described (and heard) as main degrees:

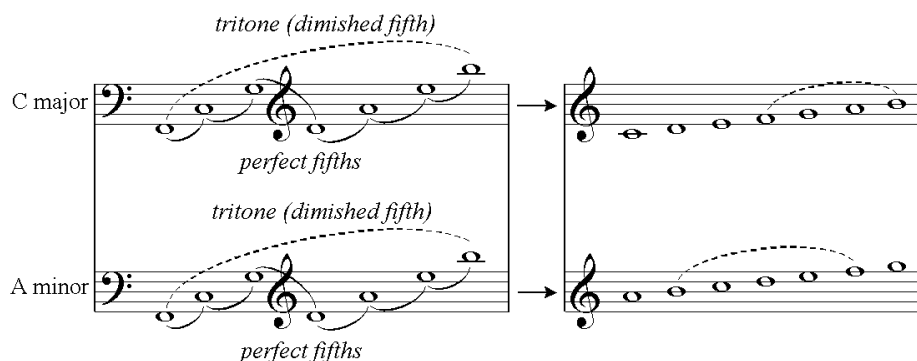
- The fifth can be considered as the 'simplest' interval (after the octave, but an octave is hardly heard as an interval).<sup>10</sup> When two chords with roots a fifth apart are connected, this connection is perceived as 'strong'. (We could also say: as 'easy understandable': every other connection of two chords is more complex.) I and V are a fifth apart, as are IV an I:

*example 4* in G major



- A diatonic key (a key, consisting of five whole tones and two semitones) basically is a row of perfect fifths.<sup>11</sup>The major and the 'natural' minor keys both are diatonic keys. In other words: major and minor keys consist of a *part of the circle of fifth* (namely half of it, plus one tone):

*example 5*



It is therefore logical that chords on tones just *one fifth apart from the tonic* (in both directions) have special importance. Chords on tones that are further away from the tonic (measured in fifths) have weaker relations with the tonic, which results in less functional clarity. For instance: a triad on D in the key of A minor is just one fifth apart from the tonic, and has clearly dominant function; a triad on F on the other hand is four fifth apart from the tonic, and therefore functionally much less clear.

In the next chapter I try to specify the *meaning* of the terms tonic, subdominant and dominant.

<sup>10</sup> After the octave, the fifth is the most *consonant* interval. This is visible in the structure of the *overtone series*.

<sup>11</sup> Next to major and minor keys, the so-called "church modes" (or better, and shorter: "modes") are diatonic as well.

## tonic, dominant and subdominant / main degrees

The functions: tonic and dominant are relatively easy understandable. The **tonic** can be regarded as *resting point*, or *starting point*. The first degree in particular is clear: the vast majority of tonal music ends on I, most pieces also start on I. In other places in a composition a conclusion of a phrase on I mostly sounds as a resting point as well

The **dominant** tends to 'lead to' this resting point. Thereby the following points are important:

1. A chord with dominant function *always* contains a **leading tone** (= the seventh of the scale, a *minor second* below the root). The presence of the leading tone can be regarded as 'minimum condition' to which a chord must meet to be able to act as a dominant. The leading tone has a *melodic function*: it leads into the root of the key, in the same voice. (in other words: it *resolves* to the root::  $7^\wedge \rightarrow 1^\wedge$ ). In *minor* keys, in all dominant chords the (*artificial*) *leading tone must be used*, as the seventh of the 'natural minor' scale is a major second below the root, and therefore not useable as leading tone. See example 6a.
2. The main degree V contains the leading tone (= the third of V), and moreover the **fifth of the key**. This fifth has a tendency to fall a fifth down (or jump a fourth up) to the root of the key. This tendency can be called: the *harmonic aspect of the dominant function*.

*example 6*

a. C major A minor      b. C major A minor      c. C major A minor

So, in the triad on V, the melodic function of the leading tone is combined with the harmonic function of the dominant; see examples 6c. en 6d.

The relation V – I can be understood as: the dominant creates tension, which is put to rest in the tonic.

d. C major A minor

The **subdominant** is less clear than the tonic or the dominant (several theorists even deny the existence of the subdominant ...). Since Rameau<sup>12</sup> introduced the term "subdominant", a wide range of explanations have been given. I more or less follow the explanation of Schoenberg:<sup>13</sup>

Two chords standing a fifth apart are strongly related, because they have a **common tone** (through the distance of a fifth). This applies to V and I, but also to VI and II, and so on. Schoenberg calls this the '*harmonic tie*'<sup>14</sup> between two chords (see the dotted lines in example 6d). Logically, every triad is harmonically connected with two other triads in this way: with the triads a fifth above, and a fifth below. For instance: I is harmonically 'tied to' V (the fifth of I is the same tone as the root of V), and to IV (the root of I is the same tone as the fifth of IV).

The relations between I and IV, and between V and I are similar: I could be considered as a 'kind of dominant' to IV (see example 4): I may 'lead to' IV, as V is leading to I - because of the distance of the fifth, the 'harmonic tie'. The function of IV, and of the subdominant in general, could then be described as: 'leading away from the tonic, moving away from the centre' (centrifugal). The dominant is 'moving to the centre' (and therefore can be called: centripetal). It is then logical to

12 Rameau: Nouveau Système de Musique Théorique (1726)

13 Arnold Schoenberg: Harmonielehre (1911)

14 German: harmonischer Band

assume that after I – IV (moving away from the tonic) V – I should follow (reconfirming the tonic)

When we look at these basic harmonic relations in this way, the relation between IV and V actually is almost a 'non-relation': these chords have no common tone (no harmonic 'tie'), as they do not stand a fifth apart. In *minor keys* there is a *melodic* relation though: the third of IV (6<sup>^</sup> of the key) normally leads to 5<sup>^</sup> - see example 7.

*example 7*

MAJOR

*no direct relation*

IV  
subdominant  
- centrifugal -

V  
dominant  
- centripetal -

I  
tonic  
- resting point -

I IV V I

MINOR

*melodic relation*  
6 ---> 5

IV  
subdominant  
- centrifugal -

V  
dominant  
- centripetal -

I  
tonic  
- resting point -

I IV V I

It is also possible to describe the function 'subdominant' in a different way:

Especially in the Classical era, the harmony at the beginning of pieces, or at the beginning of sections of a form, often consists of only tonic and dominant chords. We then have the impression that the harmony does not really move yet, and that some harmonic *development* is needed, before the music can aim at some kind of harmonic 'conclusion' (a final cadence, for instance). The subdominant often appears after moving forth and back from tonic to dominant for some time (in themes the first subdominant often appears at the beginning of the consequent). The subdominant then can be seen as starting point of a harmonic 'conclusion'. In a way this is logical: as soon as the subdominant appears, all three functions have been used, and the music then will move towards a *cadence*.

This phenomenon is clearly visible in the first theme of Mozart's piano sonata in G major (see example 35): in the first four bars only tonic and dominant harmonies are used. The subdominant appears in bar 5, and from here the music is aiming at the full cadence in bar 8 (or bar 10). In the first theme of Mozart's piano sonata in A minor (see example 12) we observe a similar procedure: in the first four bars only I and V7 are used (on top of a tonic pedal point); the consequent (from bar 5) starts from a tonic harmony, and in bar 6 the harmony is 'put into motion' by IV.

### secondary degrees

The relation between the three main degrees can be understood from the distance of the fifth (between IV and I, and I and V); the relation between the *main degrees* and the *secondary degrees* can be understood from the distance of the third. Triads with roots a third apart have *two common tones*; therefore their sound is somewhat similar (though not all triads a third apart are sounding equally 'similar'). Probably this is the reason that chords with roots a third apart are *functionally related*. The three main degrees each are functionally related to two secondary degrees, standing a third higher and a third lower. IV for example is functionally related to II, and to VI.

As visible in example 8, there are a few 'overlaps' (which is logical: three main degrees relate to



six secondary degrees – but a key contains only seven degrees!): III and VI are a third apart from two main degrees with *different functions*. In major keys both chords are functionally unclear - the context has to clarify their function. The same applies to VI in minor keys - but not to III: when no leading tone is used in this chord, it has tonic function; when the leading tone is used, it automatically has dominant function .

In minor keys, when talking about harmony, we normally can assume the *harmonic minor* key: in tonal music the seventh of the key often is raised (leading tone). You should realize though that scales like 'natural', 'melodic' and 'harmonic' minor are basically artefacts: in most tonal music they are mixed. The choice to use the leading tone (and/or the raised sixth tone) nearly always depends on *melodic direction*: the 'high' 6<sup>^</sup> and 7<sup>^</sup> 'cause' ascending motion, the 'low' 6<sup>^</sup> and 7<sup>^</sup> 'cause' descending motion. Else than V and VII, III in minor keys seldom contains the leading tone:<sup>15</sup>

**example 8**

**G major**

always subdominant function

mostly tonic function, sometimes subdom. function

mostly tonic function, sometimes dominant function

always dominant function

**G minor**

always tonic function

always dominant function

I will not give detailed description of the relations between secondary degrees and main degrees here. Just a few observations:

- Secondary degree mostly are 'weaker representatives' of a function than the main degree with the same function: they stand further apart from the root of the key (measured in fifths). III and VI are the 'weakest' degrees - the function of these degrees is not clear beforehand (but: III in minor keys *is* functionally clear, see example 8!)
- **VII is rather clearly a dominant**: the chord does not contain the fifth of the key (this fifth characterizes V, and the relation between V and I), but: the *leading tone* in VII makes that it leads to a tonic chord. In other words: VII is lacking the *harmonic* dominant function, but the *melodic* function ( 7<sup>^</sup> —> 1<sup>^</sup> ) makes clear enough where VII is 'aiming at'.
- **II is very clearly a subdominant**. The relation between I and II is less clear than between I and IV (as they are not a fifth apart); but the relation between II and V is more compelling than IV – V: II and V *are* a fifth apart (see example 9). This distance between II and V is without any doubt an important reasons that II is used very often instead of IV:

**example 9**  
II i instead of IV, before the dominant

IV V I II V I

- Secondary degrees often are used as **substitutes** of main degrees. A secondary degree may also be used *after* the main degree with the same function, causing the function of the main degree to last longer; in this case we can speak of **prolongation**<sup>16</sup> of a function. See example 10.

<sup>15</sup> So, III in minor normally has tonic function, and seldom dominant function.

<sup>16</sup> This term is used also for other 'extension techniques'. Compare page 30: voice leading chord within a prolongation

- The functions of **VI** and of **III** depend of the context. In the chord progression V - VI, VI takes the place of I (because we *expect* I after V - **substitution** ); VI in this situation is a (weak) tonic. In the chord progression I - VI - V - I , the function of VI is: subdominant (it takes the place of IV or II). In the chord progression I - III - IV - V, III is a tonic, because it *is* prolonging I (and thats why, in minor keys, in this progression the use of the leading tone in III is not possible..) See again example 10.
- It makes some sense that the 'row of thirds' in example 8 starts on II and ends on VII. It is a nice idea that the tonic is standing in the middle (and it belongs in the centre, of course..) More important is that II en VII, though they are a third apart, are hardly connected - in spite of the two common tones. II is related to IV (and: a third apart from IV), and always a subdominant; VII is related to V (and: a third apart from V), stands *on the leading tone*, and therefore always has dominant function. This functional difference rules out any direct relation between II and VII.

example 10 prolongation and substitution, using secondary degrees

- We can deduce from example 8 (or example 5) that secondary degrees - like the main degrees - are a **fifth apart from each other**. Relations like V - I have equivalents among the secondary degrees: we could argue (simplifying matters a little) that the progression V - I can be 'imitated' by secondary degrees.<sup>17</sup> For example: between VI and II, or III and VI a dominant-tonic-relation can be suggested - as it were on a lower level: the second chord is no 'real' tonic, and the first chord no real dominant (often there is no leading tone in this chord). Because of the distance of a fifth the progression is nevertheless similar to V - I . In such cases we could speak of '**figurative**' or '**improper**' **dominants**. As the major and minor keys may be described as a row of fifths (see example 2), every degree can act as 'quasi-dominant' of another degree. Eventually, all degrees can be put in a row of fifths:

I	IV	VII	
	III	VI	
	II	V	I

This order of all scale degrees is very common in tonal music. The last three chords then act as final, complete cadence :<sup>18</sup>

of a function.

17 Maybe even I - IV is an 'imitation' of V - I ?

18 Complete cadence: see page 14.

**example 11**

all degrees, in a row of fifths  
(diatonic sequence with descending fifths)

This chord succession sometimes is called a **sequence with (diatonic) dominants**; it is more correct to call it a **diatonic sequence with descending fifths**: 'descending fifths' because of the distances between the chords, 'sequence' because a pattern is constantly repeated. Sometimes it is simply called: **row of (descending) fifths**. We normally tend to hear the chords in this sequence 'two by two', and then (often through the *melody*) perceive a sequential pattern with *descending seconds*.<sup>19</sup>

In diatonic sequences with descending fifths in *minor keys* the leading tone is only used in the V, preceding the final tonic: VII en III contain no leading tone: they use the 'low' seventh of the key. We could speak of 'natural' VII and 'natural' III here, or adopt the common Dutch (and German) practice and call them *eolian* (abbreviated: VIIeol , IIIeol).

Example 11 also shows that II takes a special place among the secondary degrees: it is, as the 'last fifth before V', particularly suitable as substitute for IV in a final cadence.

Some of the above mentioned points are visible in example 12. The first four bars of this theme move forth and back between tonic and dominant (on top of a pedal point <sup>20</sup> in the bass). In fact the harmony starts to move not earlier than in bar 5, the first bar of the consequent. Bars 5-9 contain a complete *sequence with falling fifths* (see the harmonic analysis in the example). From II6 in bar 8 we can speak of a final cadence - within the sequence with falling fifths..<sup>21</sup> The *leading tone* (G#) is only used at the end of the sequence, in V7:

**example 12** Mozart, sonate in A minor, K 310, beginning of the first movement

Allegro maestoso

19 Because: two descending fifth result in a descend of a second. Bars 5-9 of Mozart's Piano Sonata in A minor are a good example of this procedure (see example 12): we hear sequences *per bar* in the melody, falling a second. The underlying chords form a sequence with descending fifths.

20 See the chapter *structural and non-structural harmony / faux-bourdon / pedal point*

21 See page 12.

## Closes, (final) cadences

Cadences (or: closes) are an important means to structure music: they mark for example the end of musical phrase,s or of sections of a musical form.

Below a schematic overview of the different types of **closes/cadences**. I am using two different sets of terms, referring to different phenomena (though there is some overlap):

The following terms describe *in which way we reach a final tonic*:

1. **authentic cadence**: an ending, in which the final tonic is **preceded by a dominant** (mostly: V). see example 13a.
2. **plagal cadence**: an ending, in which the final tonic is **preceded by a subdominant** (mostly: IV or II). see example 13b.

The following terms describe *on which function we are ending*:

1. **full cadence**: an ending on I, the tonic. Normally this final I is in *root position*. We speak of a **perfect** full cadence when the the bass *and* the highest voice both end on the root of the key (= the root of I ). When the highest voice ends on the third or the fifth of the key, the cadence sounds less 'stable'. We then speak of an **imperfect** full cadence. See example 13c.
2. **semicadence** (or: **half cadence**): a 'temporary' ending **on the dominant**, normally V ; the usual place of a semicadence is *halfway a musical phrase* (typically: halfway a period). As a rule, V in a semicadence is in root position, but endings on 6-, 6/5-, 4/3- of 2-positions are also possible. See examples 13c en 13d.
3. **deceptive cadence**: in an ending, the **final chord** after the dominant is **not I** (though we are *expecting I* ), but another degree.<sup>22</sup> Common procedure: the **leading tone** (in the dominant chord) **is resolving** to the root of the key, though this root is part of a 'wrong chord' (often VI, less often IV6, and sometimes still another chord). A deceptive cadence often is used to achieve *prolongation* of a musical phrase: after the decepetive cadence a new attempt has to be made to reach the final tonic. See examples 13e en 13f.

**example 13**  
cadences

The image shows four musical examples of cadences in a grand staff (treble and bass clefs).  
**a. authentic cadence**: Shows a progression from C major (V) to A minor (I). The first part is labeled 'C major' and the second 'A minor'.  
**b. plagal cadence**: Shows a progression from C major (IV) to A minor (I). The first part is labeled 'C major' and the second 'A minor'.  
**c. full cadence**: Shows three variations: 'perfect' (V to I), and two 'imperfect' (V to I with different voice leading).  
**d. semicadence (or: half cadence)**: Shows a progression from I to V, then IV to V.

<sup>22</sup> Sometimes the German term **Trugschluß** (trügen=to deceive) is used. In French (and Spanish, Portugese etc.) the deceptive cadence cadence is called a *broken cadence*: **cadence rompue**, **cadencia rota** etc.

antecedent (ending with semicadence)      consequent (ending with full cadence)

I -----> IV V      IV -----> II V7 I

e. deceptive cadence

C major      A minor

leidtoon      leidtoon

V7 VI      V7 VI

f. deceptive cadence as technique of prolongation

V VI      V I

'failing cadence'      'second try': cadence 'succeeds'

Deceptive cadences can *cause* prolongation of a phrase, because a 'proper ending' is avoided. *Plagal cadences* often are prolongation in itself, because they are *following after* a full cadence. See example 14. This use of a plagal cadence is, for example, frequently found in the 'Amen' at the end of a section of a mass:

**example 14**  
plagal cadence as prolongation

I II6 V I      IV I

authentic cadence / full cadence      plagal cadence

An example of an *Amen*, linked to a plagal cadence - the example is from 1869:<sup>23</sup>

**example 15**  
Bruckner, final bars of the *Ave Maria* From the motets)

o - ra pro - no - bis. A - - men.

D -----> T      S -----> T

authentic cadence / full cadence      plagal cadence

At \* the melody (in fact: the piece) is finished. The plagal cadence is an addition.

Three centuries earlier (1567), in a composition by Palestrina:

<sup>23</sup> See also the beginning of the second movement of Beethoven's Third Symphony (example 19), bar 8.

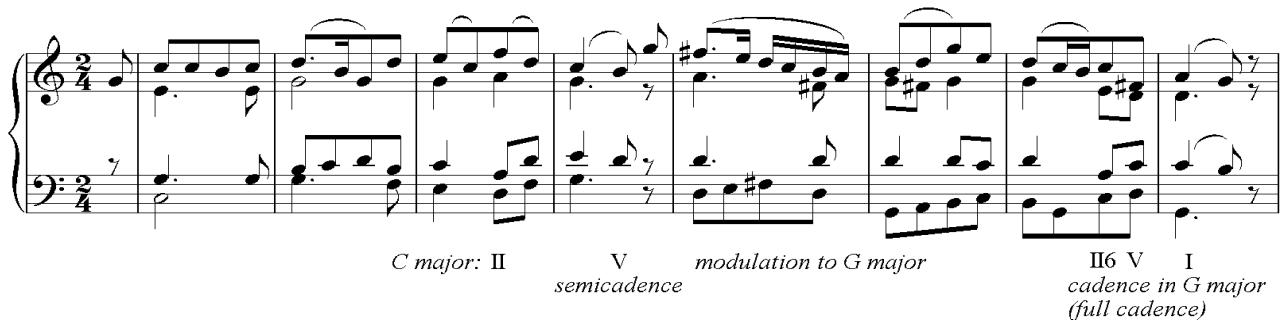
**example 16**  
 Palestrina, *Missia Papae*  
 Marcelli, final bars of the  
 Kyrie



In fact, the term **cadence** is used in different ways; apart from describing certain types of endings (like described above: full cadence, deceptive cadence etc.), it is also used in a more general way, to indicate that some endpoint or cesura is reached. And it is also used to describe certain *groups of chords*.

- Cadence, in the most *literal* sense of the word means: a closure (on a certain scale degree - often the tonic is meant; the harmony 'falls to' the tonic, cadere=to fall).<sup>24</sup> The word 'cadence' can be used in sentences like: "After the modulation we end with a cadence in G major". In this context, we could also speak of a '**cadential point**', to indicate the precise point where the cadence is *completed* (in a closure V – I this point is the I).<sup>25</sup> We can speak of a **complete cadence** when an ending contains all three functions, for example: IV V I or II V I. See example 17:

**example 17** cadence



- Another meaning of 'cadence' is: a series of chords, 'defining' a key. Mostly we need at least three chords for that purpose: combination of for example the C major and F major triads can be interpreted in different ways: for example as V – I in F major, or as I – IV in C major. It is quite obvious that many different combinations are possible – some combinations though are of particular interest, as they often occur, and therefore can be regarded as a kind of 'fixed formulas':
  1. the above mentioned **complete cadence**: this cadence is often shown with a tonic at the beginning (which is not always the case in 'real music'...), and then consists of the functions tonic-subdominant-dominant-tonic, for example expressed through the degrees I – IV – V – I or I – II – V – I .

<sup>24</sup> The cadences in example 13 could also be called 'closures' in this sense – only the deceptive cadence is a bit problematic, because an actual ending is *avoided* through of a deceptive cadence.

<sup>25</sup> I don't believe *cadential point* really is part of existing English terminology though..



**embellishing tones (passing tone, neighbouring tone, suspension, anticipation)**

In most compositions, not all tones are part of the harmony. Next to the chords used in a piece, mostly *horizontal lines* play an important role. Those lines hardly ever are moving in the same pace as the underlying harmony (mostly they move faster, sometimes slower). Imagine for example a stepwise moving melody above a single chord, or a melody over a slower moving chord succession:

**example 19**

Beethoven, Third Symphony, beginning of the second movement

Marcia funebre. Adagio assai  $\text{♩} = 80$  II

*sotto voce*

I ————— 16      I6/4 V  
T ————— D

5

Vln. 1      Vln. 2      Vla.      Vc.      Cb.

VII2      VII7      V7      I      II6/5      I6/4      V7      I      IV      I  
D      T      T      S      D      T      T      S      T

afsluitende (authentieke) cadens      plagaal slot

The first three bars of the above example contain just a single harmony: the tonic triad, consisting of the tones C, Eb and G. The tones B, D and F in the first bar are not part of the harmony (as they are not part of the tonic triad). The same applies, in bar 5, for the tones Eb and G in the first violin and for C and Eb in the double bass: the underlying harmony, VII7, consists of B, D, F and Ab. Such tones are called: **embellishing tones** (or: **ornamental tones**). We are looking then *from the harmony*, and note that some tones in a (melodic) line are part of the harmony, and some are not. Often the melody is the voice that is moving faster than the underlying harmony; sometimes another voice (a middle voice, or the bass) is moving faster. So: embellishing tones can occur in all voices.

There are four types of embellishing tones: **passing tone, neighbouring tone, suspension and anticipation**. And within these four types we can distinguish between different *forms*. Below a schematic overview; at the left examples with only two voices, at the right similar examples with four voices.



- **passing tones** stand on **weak beats**, and connect *different* tones; they are not part of the underlying harmony, whereas the tones before and after *are* part of the harmony:

*example 20* passing tone

When a passing tone causes a dissonant, we can speak of a **dissonant passing tone**; when a passing tone is not causing a dissonant we call it **consonant passing tone**.

Two musical staves in 4/4 time. The first staff shows a melody with three passing tones: a dissonant one (p (diss.)), a consonant one (p (cons.)), and another dissonant one (p (diss.)). The second staff shows a piano accompaniment with chords. A legend below states: p = passing tone, diss. = dissonant, cons. = consonant.

Sometimes two notes form a kind of 'passing tone group': see the first bars of both examples: -->

Sometimes a passing tone *is* standing on a (relatively) strong beat, giving the impression that it is coming 'too late' (in the second bars of the examples the passing tone could stand on the second half of the first beat as well). In such situations we can speak of **relatively strong passing tones**.<sup>26</sup>

Two musical staves in 4/4 time. The first staff shows a melody with two 'relatively strong passing tones' (rel. strong p) occurring on strong beats. The second staff shows a piano accompaniment with chords. A legend below states: rel. strong p. = relatively strong passing tone.

- **Neighbouring tones** also stand on **weak beats**; in principle they connect two identical tones; they are not part of the underlying harmony, whereas the tones before and after *are* part of the harmony:

*example 21* neighbouring tone

We can distinguish between **upper neighbouring tones** and **lower neighbouring tones** (or: **upper neighbour / lower neighbour**). Like passing tones, neighbouring tones may cause a dissonant - which means that we can speak of **dissonant** and **consonant neighbouring tones (neighbours)**:

Two musical staves in 4/4 time. The first staff shows a melody with two neighbouring tones: a lower one (lower n (diss.)) and a higher one (higher n (cons.)). The second staff shows a piano accompaniment with chords. A legend below states: n = neighbouring tone.

A neighbouring tone may be **incomplete**: it may be *reached* by leap - in fact it is then *reached from another tone of the chord*; or it might be *left* by leap - in fact it is then *leaping to another tone of the chord*.<sup>27</sup>

Two musical staves in 3/4 time. The first staff shows a melody with two 'incomplete neighbouring tones' (incompl. n). The second staff shows a piano accompaniment with chords. A legend below states: incompl. n.

<sup>26</sup> This is certainly not a standard English term though...

<sup>27</sup> In Dutch (and German) these neighbours are described as 'freely entering' and 'escaping' respectively. There is no appropriate English description for this distinction.

- Like passing and neighbouring tones, **anticipations** stand on **weak beats**. Anticipations are tones that 'appear too early'; they are not part of the underlying harmony, but part of the harmony *on the following strong beat*. Anticipations mainly occur in closures, where then almost always the *root of the key* is anticipated, *in the upper voice*.<sup>28</sup> The anticipation appears then on top of a dominant harmony, just before the final tonic:

*example 22* anticipation

Anticipations *always* cause a dissonant:

a = anticipation

A small example, the final bar of the *Air* from Bach's *Second French Suite*. The penultimate tone in the upper voice (C) is an anticipation, forming a dissonant with the bass (the interval between bass and upper voice is a dissonant fourth). On the third beat the two voices form a consonant again (octave):

anticipation (forming a dissonant fourth with the bass)

- Different from all other embellishing tones, **suspensions** stand on **strong beats**; they are 'delaying' a tone of a chord<sup>29</sup> Suspensions are mostly **dissonant**, and resolve into a consonant on a weak beat. We distinguish two types of suspensions:
  - **prepared suspension**: a consonant tone on a weak beat is repeated, or tied to, a tone on the next strong beat; on the strong beat this tone is forming a (dissonant) suspension;
  - **unprepared suspension**: the suspension is reached by step or leap - there is no tone repetition (or tie) from the preceding weak beat:

*example 23* suspension<sup>30</sup>

Prepared suspension: imagine the 'procedure' as:

preparation	suspension	resolution
consonant	dissonant	consonant

s = suspension

Unprepared suspension:

<sup>28</sup> But: compare example 32!

<sup>29</sup> In a way suspensions are exactly the *opposite* of anticipations: a suspension causes that a tone (which is part of a chord) is appearing 'too late'; an anticipation is a tone that is appearing 'too early' itself.

<sup>30</sup> Compare example 32.

Sometimes a suspension is *left by leap*. In that case it is in fact not resolving – though probably another voice takes over the resolution. In example 32, bar 10, Bb in the upper voice *should* resolve into Ab, but is leaping up to Eb instead. The same happens in bar 14 (also in the upper voice). Sometimes a suspension is not *really* dissonant, though we *perceive* a dissonant - because it is *not* part of the underlying harmony, though *not* forming a dissonant with this harmony. This is called: **consonant suspension**. As there is no factual dissonance, we can speak of “**Auffassungsdissonanz**”.<sup>31</sup>

**example 24**  
 Schubert,  
 Piano Sonata  
 in A major  
 D64,  
 beginning of  
 the second  
 movement

Andante

VI6 -- I  
or I 6--5      VII7 -- V6/5  
or V6/5      VI6 -- I  
or I 6--5      V7 6--5      VI V6/5      I

I believe we hear the harmony in the first and fifth bar of this movement as I, with - consonant - suspensions 6-5 in the soprano (the fifth of I is suspended by the sixth). But *objectively*, on the first beat of the first bar stands VI in first inversion...

With the term **syncopated dissonance** we describe the situation that the *preparation of a suspension* is tied to the suspension, while the other voices move:

**example 25**  
 syncopated dissonance

suspensions

↑      ↑

syncopations (in the upper voice,  
the first time also in a middle voice)

This type of suspension is already very common in music of the Renaissance, usually in closures. There we always see the following pattern:

preparation	suspension	resolution	close
<i>consonant</i>	<i>dissonant</i>	<i>imperfect</i>	<i>perfect consonant</i>
		<i>consonant</i>	<i>(mostly octave)</i>

In the following example of Josquin des Prez three of these 'patterns' are indicated:

<sup>31</sup> Meaning: 'dissonance by perception' or 'dissonance by interpretation'. There is no adequate English translation for this German term.

**example 26**  
 Josquin des Prez, Missa  
 da Pacem, Crucifixus

p = passing tone  
 n = neighbouring tone  
 s = suspension

78 imitation in the octave (prep-susp-res-close)  
 ALTUS 8 7 6 5 6 6 6 6 5 4 5 6 8 9 10 9 8 7 6 8

BASSUS Cru - ci - fix - us et - i - am pro - no - bis: sub

83 imitation in the fifth  
 3 5 6 7 8 7 5 3 2 1 2 3 4 6 7 8 7 6

ALTUS sub Pon - ti - o

BASSUS Pon - ti - o

86 imitation in the fifth  
 (5) 5 4 3 2 3 4 5 6 7 8 7 5 3 2 1 2 3 4 6 7 6 6 6

ALTUS Pi - la - (or p) - Pi - la -

BASSUS Pi - la -

90 (prep - susp-res - close) imitation in the fifth  
 6 6 7 8 7 6 8 3 3 4 6 8 6 3

ALTUS - s - to pas - sus et se -

BASSUS - s (or p) - to pas - sus, et

94 (prep-susp-res - close)  
 3 3 3 4 6 7 8 7 5 4 6 8 6 6 7 8 7 6 8

ALTUS - pul - tus est.

BASSUS - se - pul - tus est.

## harmonic rhythm

The *number* of chords per bar, and the exact *placement* of these chords in the meter, form the **harmonic rhythm**. The speed of the harmonic rhythm at a distinct moment in a piece of course is interdependent with other aspects of a composition, like the structure of the phrase, the musical tension at that moment, and so on.

In the first theme of the Mozart's piano sonata in G major (see example 35), the harmonic rhythm in bars 1-7 is per bar: all these bars contain just a single harmony.<sup>32</sup> From bar 8, the harmonic rhythm is *accelerating*: every two beats show a change of chord.<sup>33</sup> Such accelerations cause increase of harmonic tension. In most four-part chorales the harmonic rhythm is relatively simple: the melody and the harmony move at the same, or almost the same, pace. Only when for instance a suspension and its resolution is taking two beats, or when other embellishing tones are used in the soprano, the harmonic rhythm is moving slower than the melody. Faster notes in other voices likewise often are embellishing tones. Some examples:

**example 27**  
Bach:  
beginnings of chorales *Es ist Genug* and *Nun danket alle Gott*

The first system shows the beginning of 'Es ist Genug' with lyrics: 'Es ist ge - nug, so nimm, Herr, mei - nen\_ Geist zu Zi - ons Geis tern\_ hin.' The piano part has annotations: 'augmented fourth' over the first two bars, 'augmented second' over the first two bars, and 'p' and 'sus' in various places. The 'harmonic rhythm' line shows a sequence of notes corresponding to the chords.

The second system shows the beginning of 'Nun danket alle Gott' with lyrics: 'Nun dan - ket al - le Gott, mit Her - zen, Mund und Hän - den.' The piano part has annotations: 'incompl. neighbours' with an arrow pointing to a note in the first bar, and 'p' and 'n' in various places. The 'harmonic rhythm' line shows a sequence of notes corresponding to the chords. Roman numeral chord symbols are provided below the piano part: I I I6 IV IV6IV I I V6/5 I V-2 I6 I V 8/4 = 7/3 I.

In most *instrumental* music, and a quite a lot of non-chorale vocal music, we encounter more complex patterns than in the above chorales: usually melodies **move faster than the underlying harmonic rhythm**: normally multiple tones of a melody are combined with one chord; melodies often are (partly) consisting of tones of the underlying chord(s) (whether or not in combination with passing tones, suspensions, etc.). Especially in fast movements melodies tend to move much faster than the underlying harmony. See for example the beginning of Schumann's Rhenish Symphony: example 28 shows the melody, the chords, and the harmonic rhythm; the second system contains a harmonic reduction of the same bars:

32 The situation in bar 7 actually is no more than a change of inversion: V4/3 becomes V6

33 This accelerating harmonic rhythm is connected with the *hemiola* in these bars. See page 29.

**example 28** Schumann, Rhenish Symphony, beginning of the first movement, melody and harmony/harmonic rhythm. And a harmonic reduction:

in the chord:

1 5 3 1 3 1 5 3 1 5 3 7 1 5

The 'in the chord' section shows a melodic line in 3/4 time with notes: G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4, B3, A3, G3. The 'harmonic rhythm' section shows a piano accompaniment with chords: Es, c, F Dom7, Bes, Es Dom7, As, Bes Dom7, g.

harmonic reduction:

The harmonic reduction shows the chord progression in a grand staff. The chords are: I, VI6, (V2) V6, (V2) IV6, V7, III6. Below the staff, a line indicates the progression: T → D → (p) → D.

The same fragment, complete score:

The complete score includes parts for Flute, Oboe, Clarinet in Bb, Bassoon, Alto Horn in Eb, Trumpet in Eb, Timpani, Violin 1, Violin 2, Viola, and Violoncello/Contrabass. The tempo is marked 'Lebhaft' with a quarter note equal to 66. The score shows the orchestration of the melody and harmonic rhythm from the previous sections.

Example 29 shows the harmonic rhythm of the first 13 bars of the *Graduale* of Bruckner:

**example 29** Bruckner, *Graduale Christus factus est pro nobis* (from the motets) Rhythm of the melody and harmonic rhythm

rhythm in the melody:

(alto) (soprano)

harmonic rhythm:

8

The complete score of the beginning of this piece:

## Christus factus est pro nobis

Anton Bruckner  
komponiert 1884

**Moderato misterioso**

Soprano *p* *mf* *f*  
Chris tus fac - tus est pro no - bis o -

Alto *p* *p* *mf* *f*  
Chris tus fac - tus est pro no - bis o -

Tenor *p* *p* *mf* *f*  
Chris tus fac - tus est pro no - bis o - be - di - ens, o - be - di - ens, *f*

Bass *p*  
Chris tus fac - tus est pro no - bis o - be - di - ens, o -

7 *dim. sempre* *pp*  
S. be di - ens, o - be di - ens, o - be - di - ens us - que ad mor -

A. be - - - - di - ens us - que ad mor -

T. o - be - di - ens, o - be - di - ens, o - be - - di - ens us - que ad mor -

B. be - - - - - di - ens us - que ad mor -

13

S. *f* *dim.* *pp* *G.P.*  
 tem, mor - tem au - tem cru - - cis.

A. *f* *dim.* *pp*  
 tem, mor - tem au - tem cru - - cis.

T. *f* *dim.* *pp*  
 tem, mor - tem au - tem cru - - cis.

B. *f* *dim.* *pp*  
 tem, mor - tem au - tem cru - - cis.

**motifs, bar groups, and harmonic structure**

Closes, cadences and harmonic rhythm hardly can be considered separated from the role they play in *musical structures*: logically (for example), semicadences usually stand at the end of the first half of a phrase, full cadences at the end (and the phrase then can be called a *period*). A semicadence at the end of a phrase rather suggests: 'now some development will follow'. A semicadence *at the end of a section* (often lasting for some time) suggests: 'hereafter a new section will start'. And so on...

Examples 30 and 31 show various closes, and various forms of harmonic rhythm. The examples also show that **final chords** usually stand on **strong beats**; normally these strong beats are *first beats*.

*example 30* Mozart, Violin Sonata in E minor, beginning of the first , begin van het eerste deel

Allegro *p*

antecedent | consequent

period

t → D (semicadence) s → [ t ] D →

9

'connection' - three 'run-ups'; the third one is 'succesfull'

T (full cadence) 'description' of the dominant t



period  
varied repeat of bars 1-8)

Bars 1-8 of the above example form a period (semicadence in bar 4, full cadence in bar 8). At the end of the consequent (bars 7/8) the harmonic rhythm is accelerating. After a 'connection' (bars 9-12), the first period is repeated (from bar 13, with some changes..). This example shows that there is no need to write actual vertical chords to make clear that harmony is present: despite the *unisono* of the first 12 bars we clearly hear harmonic functions. Sometimes though, such implied harmony is unclear: given the harmonization in bars 13-20, it is quite uncertain whether bars 5/6 really have 'subdominant character'.

In the following example, from Schubert's *Moment Musical No. 2*, the harmonic rhythm is more complex than in the above Mozart-example. At first sight (see the degrees under the notes in example 31) the harmonic rhythm at the beginning of this fragment seems as follows: one harmony in bar 18, one harmony in bar 19, three harmonies in bar 20. But, when we look at the *functions* of these chords, we can rightly claim that 'little or nothing' is happening in these bars: I is the most important chord in all three bars, the other chords are 'encircling' the tonic, and are dependent of it: they are *neighbouring chords*.<sup>34</sup> In fact the harmony starts to move not earlier than at the end of bar 21, as the bass moves to a new tone (and the harmony changes from I to I6). In the consequent (bars 24-31) we observe something similar: in bars 24-26 the harmony is much more 'static' than from bar 27: bar 24 contains one harmony; the next harmony is lasting two bars (bars 25/26). From bar 27 the harmony moves faster: we mostly see two harmonies per bar. In bars 32-35, the transition to the next section of the piece,<sup>35</sup> the harmony moves slower again: bars 32 and 33 contain one harmony per bar, and in bars 34/35 one harmony is sustained:

**example 31**  
Schubert,  
moment musical  
Nr. 2 in Ab  
major, bars 18-  
35

34 See also from page 30.

35 This next section is not displayed in example 31

### hemiola and syncopation

The rhythm in a piece may of course move at the same pace as the meter; more common is interaction between the metric pulse, and rhythmic structures *within* the pulse. When rhythmic patterns *contradict* the meter, this is mostly caused by a **hemiola** or a **syncopation**.

Syncopations, caused by ties in one or more voices, combined with *suspension* in one voice or several voices, are very common (the so-called *syncopated dissonance*)<sup>36</sup> Such suspensions are all over the place in example 32: in the first section of this piece (*Allegretto*) the ties cause several dissonant suspensions on first beats, in the upper voice. This is clearly audible in bars 9-16, 27/28 and 31-33, especially because the same material has been presented before *without* suspensions (compare for example bars 1-8 with 9-16). The upper voice also contains suspensions on the first beats of bars 18, 20, 23 and 24. From bar 37 (the *Trio*) we encounter anticipations instead of suspensions.<sup>37</sup>

#### *example 32*

Beethoven, Piano Sonate in C# minor Op. 27 Nr. 1, *Allegretto*

36 See page 19/20, examples 25 and 26.

37 The anticipations in the Trio in example 32 are quite of a quite uncommon kind. in het Trio in example 121 behoren niet tot de meest voorkomende. Anticipation of the *root* of the key in the top voice is much more usual - see page 18.

11

21

29

**Trio**

*Fine*

Especially from the Classicism sometimes **syncopations in all voices** (at the same time) are used. These syncopations cause a shift of metrical accent to a tone (mostly) before or (sometimes) after the syncopation. In extreme situations the listener may believe that the bar itself is shifted one or several beat(s) - until a 'normal' first beat appears (see example 33); or he may believe that temporarily the meter is changed (see example 34):

**example 33**  
 Beethoven, Piano Sonata Op. 109, fragment from the first movement

23

*p cresc.*

*sf*

*espressivo e semplice*

*ending in E major  
 (key of the second group)*

T




29 syncopations: downbeats (first and fourth beat) 'expire' continuation of syncopations

36 main motif pp cresc.

42 first part of the main motif is splitt off f p cresc.

T pedal point on the tonic

F# minor V7 F# minor I D major V4/3

The concluding motif (last beat of bar 24 and first beat of bar 25) is repeated several times, until bar 29. Through the tie between the two tones of this motif:  a long-lasting syncapted rhythm is created (from bar 29). We perceive a shift of meter, and at some moment we don't hear  anymore, but:  instead.

In bar 35 the meter is readjusted - but even thereafter syncopations are permanently present (see the top voice from bar 37, and the bass from bar 41).

**example 34**

Brahms, fragment from the first movement of the *Violin Concerto* Op. 77

(Allegro non troppo)  
meter, as suggested by the solo violin

solo violin  
poco f espressivo

arco  
pizz. arco

meter, as suggested by the bass

The solo violin part suggests three 5/4 bars, instead of five 3/4 bars. The bass is making the situation even more confusing, as it is suggesting still another meter, namely a succession of 4/4, 5/4 en 3/4 bars. The middle voices, though 'organized' in 3/4, cause confusion through syncopations, more than helping to clarify the 3/4 meter.

We speak of **hemiola** when a shift of metric accent is causing the impression of a temporary change of meter. This may happen for example, when in triple meter, through a shift of metrical accent, two groups of three beats are changed to three groups of two beats. This is quite common in *endings*, especially in Baroque music - we could then speak of a '**closing hemiola**'<sup>38</sup> The following example, the first theme of the first movement from Mozart's piano sonata in G major, contains such a 'closing hemiola': at the end of the theme (bars 8-10, and again in bars 14-16) two 3/4 bars actually are changed to a single 3/2 bar. We perceive a hemiola here because of the placement of the chords in the meter (on first, third and second beats), and because of the angular points in the melody (it changes direction on the third beat of bar 9, and again on the second beat of bar 10):

*example 35*

Mozart, Piano Sonata in G major, beginning of the first movement (first theme)

Bars 1-4: **antecedent**, mainly determined by the tonic triad (the dominant chords in bars 2 and 3 are neighbouring chords, meaning they are harmonically 'weak').

Bars 5-8: actual **consequent** (the first beat of bar 8 *could have been* the end of a clear final cadence..). Extension of *motif 1*, together with melodic and rhythmical compaction, causes increase of musical tension: motif 1 has a feminine ending now, and is repeated after just one bar. The appearance of the first subdominant of the piece, in bar 5, adds to the increase of harmonic tension.

Bars 8/9: **extension** of the consequent through a hemiola, in combination with a clear complete authentic cadence T S D T. Bar 10 contains the ending that could have been in bar 8 already. In bars 11-16 the whole consequent (with extension) is repeated.

Dynamic accents may also go against the meter to a certain extent: when accents are given on weak beats, they stand against the meter – though there is no syncopation or hemiola involved. Especially Beethoven likes the use of such 'antimetric' dynamic accents.

38 This is not an English term, I fear - rather a literal translation of the Dutch *slothemiool*, or German: *Schlußhemiole*.

## structural and non-structural harmony / faux-bourdon / pedal point

In tonal music, mostly the **chord succession** is not an independent phenomenon. It normally is connected with, independent of, or even: arises from *horizontal* phenomena, in the sense that (more or less) independent voices together *form* the harmony. The term **voice leading** then describes the course of these individual voices. In *homophonic* music usually the **outer voices** (top voice and bass) bear more importance than the middle voices: normally the upper voice contains the melody, and the bass is the most important voice for the harmony.

We have seen about one aspect of the relation between harmony and voice leading already: *embellishing tones*.<sup>39</sup> The use of embellishing tones is adding complexity to the relation between horizontal (the voices) and vertical (the harmony), as the harmony - and the *harmonic rhythm*<sup>40</sup> - is then moving *slower* than the individual voices.

We have seen above that the *distance of a fifth* can be regarded as primary *harmonic relationship*<sup>41</sup>; this holds true for the relation between chords, and also for - at a larger scale - for the relation between keys.<sup>42</sup> *Distance of a second*, on the contrary, can be regarded as the most important *melodic relation*: in the voice leading seconds usually are the most common interval. Melodic movement in seconds often arises from the use of embellishing tones. Embellishing tones may create a chord, quasi 'by accident', because *several voices* move in seconds *at the same time*: such chords may be seen as *resulting from* passing tones, neighbouring tones, suspensions, and/or anticipations. Therefore they may be called: **voice leading chords**. Voice leading chords are harmonically and functionally dependent on their environment, and often occur within a **prolongation**<sup>43</sup> of a function. See example 36:

- The first three chords may be labelled: I V6/4 I6 ; V6/4 is 'caused by' voice leading: it arises from a *passing tone* in the bass, and therefore is not independent. In other words: the tonic 'controls' the first three beats; V6/4 appears *within a tonic prolongation*.
- The chord on the third beat of bar 2 may be labelled: I6/4 ; this chord is not independent, as the tones A and C act as *suspensions*; the harmonic function of both the third and fourth beat of bar 2 is *dominant*.
- The first three chords of bar 3 may be labelled: I IV6/4 I ; IV6/4 is 'caused by' voice leading: it arises from two *neighbouring tones* (in alto and soprano). The tonic 'controls' the first three beats; IV6/4 appears *within a tonic prolongation*.
- The chords in bar 4 may be labelled: I6/4 IV6 I6/4 V; IV6 is not independent, as it arises from a *neighbouring tone* in the bass. I6/4 is also not independent; it arises from two *suspensions* (in soprano and tenor). The dominant 'controls' the whole bar.

In general we can say that

- **succession of functions** often is at an even slower pace than **succession of chords** (as several chords with the same function may follow each other<sup>44</sup>, or chords with the same function may be connected through a voice leading chord)

In other words:

- Often **melodies** contain **more tones** than the number of **chords** (degrees); and likewise often there are **more chords** than **independent functions**.

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39 See from page 16.

40 See from page 21.

41 See page 6, and page 10/11.

42 As for example the relations between the keys in forms like sonata form, rondo, large ternaries etc.

43 Prolongation: see also page 9.

44 See page 9/10.

**example 36**

voice leading chords (chords, arising from melodic movement and / or prolongation of a function.

$\frac{I}{\text{prolongation of the tonic}} \quad \frac{V6/4}{\text{prolongation of the tonic}} \quad \frac{I6}{\text{prolongation of the tonic}} \quad V$

$I \quad IV \quad \frac{I6/4}{\text{prolongation of the dominant}} \quad \frac{V}{\text{prolongation of the dominant}}$

$\frac{I}{\text{prolongation of the tonic}} \quad \frac{IV6/4}{\text{prolongation of the tonic}} \quad I \quad IV$

$\frac{I6/4}{\text{prolongation of the dominant}} \quad \frac{IV6}{\text{prolongation of the dominant}} \quad \frac{I6/4}{\text{prolongation of the dominant}} \quad V$

Most voice leading chords are *inversions* (of triads or seventh chords): root positions are 'stronger' (more stable) than inversion, and therefore functionally clearer. And voice leading chords should preferably be functionally 'weak'.

Voice leading chords are similar to *embellishing tones*: like embellishing tones are not part of the underlying harmony, voice leading chords are not part of what is called: the **structural harmony**. As with embellishing tones, we can distinguish different *types* of voice leading chords (see example 36):

- **passing chord**: a chord on a **weak beat** that connects two other chords on stronger beats; passing chords mostly are based on a passing tone in the bass.
- **neighbouring chord**: a chord on a **weak beat** that connects two other chords on stronger beats; a neighbouring chord is based on a neighbouring tone in the bass, or on one or more neighbouring tones in other voice(s).
- **suspension chord**: a chord on a **strong beat** that is perceived as suspension for the following chord on a weak beat; suspension chords mostly are based on suspensions in other voices than the bass.

There is a link with *harmonic rhythm*.<sup>45</sup> passing and neighbouring chords are on weak beats, and are perceived as 'not very important' in the succession of harmonies, and in the harmonic rhythm. Suspension chords stand on strong beats; they are 'not very important' though in the sense that not the suspension chord, but its *resolution* belongs to the structural harmony. Some examples:

In bar 1 of the slow movement of Beethoven's String Quartet Op. 18 Nr. 1 (see example 37) VII6 is used as a passing chord between I and I6: it clearly arises from the combination of a neighbouring tone (in the second violin) and two passing tones (in viola and violoncello). I6 prolongs I in root position, which is the only structural harmony in bar 1. In bar 2 we likewise find a passing harmony between I6 and I: V4/3. The first change in the *structural harmony* is at the beginning of bar 3, as V is introduced.

In fact, until the beginning of bar 4, we are dealing with *three harmonic layers*:

- the structural harmony, consisting of I – V – I
- prolongation of I through I6
- passing harmonies *within* the prolonged I: VII6 en V4/3

<sup>45</sup> See also page 21-24.

example 37

Beethoven, String Quartet Op. 18 Nr. 1, beginning of the second movement

**Adagio affettuoso ed appassionato.**

I I6 VII6 passing I I6 V4/3 passing I I6 V I VI6 II7 VII7  
or VII7 with suspension

6  
 VII6 becomes VII7 I6 VII6 I passing chord II6/5 with suspension in the first violin (VII7) V V6/5 I II6 (VII7) V V6/5 I II6 (VII7) V

From bar 4 similar things are happening, though it might seem a little more 'abstract': from bar 4 the bass is moving stepwise up; I is at the beginning of this stepwise motion (in bar 4), I6 at the end (in bar 7). It is possible to consider all chords in between as passing chords: though they are more independent than VII6 and V4/3 in bars 1 and 2, they appear within a tonic prolongation:

- VI6 can be regarded as a *neighbouring chord* 'coming from' I (see the second violin)
- II7 can be regarded as a *suspension chord* for VII7 (see the first violin)
- VII7 / VII6 / VII7 can be interpreted as actually a single chord, which is forming a *passing chord* between I en I6

When we interpret the whole passage in this way, the first structural harmony after I in bar 1 is a subdominant: II6/5 in bar 8. G# in the violoncello in bar 8 can be interpreted as a *chromatic passing tone*, which means that the chord on this tone: (VII7) can be heard as a passing chord. Then the next structural harmony is V at the beginning of bar 9.

This Beethoven-example makes clear that melody, harmony and structural harmony each may move at their own pace. The reduction below only shows the structural harmony (what I regard as the structural harmony..) of this fragment: see the degrees in the example (open noteheads refer to structural harmonies):



**example 38**

Beethoven, String Quartet Op. 18 Nr. 1,  
beginning of the second movement –  
reduction of the harmony

The harmonic rhythm in the first bars of Brahms' song  
"Traun, Bogen und Pfeil.." is recognizable as:

On the first and second beats of bars 3 and 4 stand two different chords (see the degrees in the example). But in both cases we find only a single structural harmony: I6/4 in both bars arises from two suspensions (Bb and G on the first beats), and therefore is *not independent*, but has to be regarded as a *suspension chord* for V on the second beats. This means that it does *not* have tonic, but dominant function, along with V<sup>46</sup> Actually, the appearance of I6/4 does not interfere with the harmonic rhythm in quarter notes and half notes, as the harmonic function does not change from the first to the second beat:

**example 39**

Brahms, begin  
van het lied  
"Traun, Bogen  
und Pfeil..",  
Op. 33

**Kräftig.**

c klein [ V ] I IVdm VIIeol V I Es groot VI V I IV6  
g klein III II6 I6/4 V IV I6/4 V

7

c klein VI6 II6 V II6 V I (VII7) (V) V  
Es groot V6 I IV6 V6 I IV6

In bars 7 and 8 is a 'real' change of harmonic rhythm: here we find three harmonies per bar. Again, we could ask the question whether the chords form structural harmonies: I tend to interpret the first inversions in bars 6-8 (IV6 and V6) as 'weak'. To a certain extent a *shift of meter* is taking place here, as the harmony causes somewhat emphasizes the second beats (as there are root positions of I on the second beats). From bar 9 we return to the initial harmonic rhythm, in quarter notes and half notes. In bar 11, (VII7) can be regarded as a (chromatic) passing chord.

In the first bars of example 31 (see page 25) *neighbouring chords* are used; both IV6/4 and II2 are

46 Compare with example 35, where , in bars 9 and 15, likewise I6/4 is appearing as suspension chord for V. The same holds true for bars 3 and 7 in example 32. See also example 36.

voice leading chords, arising from neighbouring notes on top of F# in the bass. Both chords do *not* have subdominant function; actually the tonic triad is 'encircled' through a '**double neighbour**' (or: '**double neighbouring tone**'):

**example 40**

double neighbour, and: Schubert, *Moment musical*

Nr. 2 in Ab major, bar 18-21, reduction. See example 31 for the score.

double neighbor

upper neighbours

upper neighbour and lower neighbours

upper and lower neighbours combined:

I IV6/4 II2 IV6/4 I

prolongation of the tonic

Example 40 (and bars 4-6 of example 37) show that it is possible to put more than a single passing or neighbouring chord between two structural harmonies. Example 36 shows a common possibility of 'layered' voice leading chords: in bar 4 of this example a suspension chord, I6/4, is prolonged by a neighbouring chord!

In a so-called **fauxbourdon** also several voice leading chords stand between structural harmonies. A fauxbourdon consists of a '*chain*' of (stepwise moving) **parallel sixth chords**. These sixth chords hardly have any harmonic meaning: in fact fauxbourdon is a *melodic connection* between two structural harmonies. This is evident in bars 45/46 (and 47/48) of the first movement of Mozart's piano sonata in G major: a 'chain' of sixth chords form a connection between I and I6; it hardly makes sense to 'label' the individual sixth chords as separate degrees:

**example 41** Mozart, piano sonata in G major, first movement, final bars of the exposition

43

tr

tr

faux-bourdon

final cadence

faux-bourdon

p

f

D major | I V7 I V7 [VI6 V6 IV6 III6 II6] I6 II6 II V7 I [VI6 V6 IV6]

49

final cadence

III6 II6 I6 ] II6 I6/4 V7 pedal point (V7) IV VII I (V7) IV VII I

Actually fauxbourdon (French for *false bass*) is an 'invention' from the fifteenth century, as a technique of harmonisation, in which a melody (**cantus firmus**) in the top voice is accompanied by two other parts, a perfect fourth (middle voice) and a sixth (bass) below the top voice; all three voices move parallel - though at the beginning and end of phrases the lowest voice forms an octave with the top voice. Starting point and end of phrases therefore sound stable; the faux bourdon

between these stable points essentially is *instable, passing*.<sup>47</sup> The accompanying voices sometimes have embellishments. Like in the above Mozart-example, in the fifteenth century usually just a small part of a composition employs fauxbourdon technique. An example from a composition by Dufay:

**example 42**

Dufay, beginning of *Ave maris stella*, in fauxbourdon (ca. 1440)

Since in the course of the sixteenth century the *parallel fifth* became more and more obsolete (and finally was banned from music, in the middle of the sixteenth century..), parallel motion between two, or more than two, voices is only possible in thirds and sixths. Or in thirds *and* sixths, in other words, in fauxbourdon. Therefore it is quite logical that precisely this - actually medieval - harmonisation technique did survive.

The fauxbourdon in example 41 (Mozart) is relatively simple. Sometimes a fauxbourdon is 'hidden', for example when other inversions stand between the sixth chords of the fauxbourdon. This is the case at the beginning of the first movement of Schumann's *Rhenish Symphony*<sup>48</sup>: the sixth chords do not always follow each other - whereas *in the background* nevertheless a fauxbourdon is perceivable : I – VI6 – V6 – IV6 – III6 (etc.). In Bruckner's Graduale *Christus factus est pro nobis*<sup>49</sup>, the harmony from bar 7 is employing a fauxbourdon - a rather complex one, because of the voice crossings and suspensions, and especially because of the chromaticism in this passage. In the background a fauxbourdon - with 7-6 suspensions on the first and third beats - is audible though:

**example 43** Bruckner, Graduale *Christus factus est pro nobis*, bar 7-11 (reduction).

On the first and third beats the sixth chords are suspended by a seventh.

Sometimes, we encounter situations very similar to fauxbourdon, where actually no 'real' fauxbourdon is at place. This is especially the case when a bass and an upper voice, moving in parallel sixths, *sometimes* form sixth chords together with the middle voice(s). A good example is the beginning of the *Allegretto* of Beethoven's piano sonata Op. 27 nr. 1<sup>50</sup>. The parallel motion in sixths in the first two bars of this piece causes *instability*, whereas the cadence in bars 3/4 leads to stability. Bars 1/2 are similar to a fauxbourdon, mainly because of the parallel motion in sixths. See example 44: Beethoven's original notes are at the left; at the right a 'reconstruction' of the fauxbourdon resembling these notes:

47 The stable sounds at the beginning and the end consist of *perfect* consonants; the sixth chords in between are less stable because they contain *imperfect* consonants.

48 See example 28.

49 See example 29.

50 See example 32.

**example 44** Beethoven, Allegretto from piano sonatae Op. 27 Nr. 1 (initial bars, and 'reconstruction' of the faux bourdon)

As with a faux bourdon, a **pedal point** causes what we could call 'layering' in harmony. A pedal point is a sustained tone in the bass, indicating the structural harmony at that moment. Mostly this bass tone is the root of V or I. The higher voices move 'freely' on top of the sustained bass, which may lead to dissonances with the bass: the harmony is as it were split in two layers, where the higher voices form a chord succession, (quasi) independent from the pedal point. In the final bars of the first Prelude of Bach's *Welltempered Piano* we see successive pedal points on V and on I. It is clearly audible that the harmony on top of both pedal points is more or less independent:

**example 45** Bach, welltempered piano, first book, final bars of the first prelude

Pedal points on V often act as a kind of long 'announcement' of the (return of) the tonic. This happens often at the end of the development section in sonata forms<sup>51</sup>, and sometimes before the second theme (hence: at the end of the transition). The pedal tone must not be actually sustained: it is sufficient when the bass *returns* to this tone often - the listener then will be able to 'think through' the pedal point himself.. See the following example, the end of the development section of the first movement of Mozart's horn quintet: Bb is not sustained; we still clearly hear a pedal point on the dominant:<sup>52</sup>

51 This is called: dominant pedal point, see my text: "Where is the beginning of the second theme?...", page 5.

52 In this pedal point, V is alternating with I6/4. This I6/4 has dominant function, as it appears within a prolongation of the dominant, as neighbouring chord.

**example 46** Mozart, horn quintet K 407, first movement, end of the development and beginning of the recapitulation

dominant-orgelpunt (eind van de doorwerking)

65

Horn in Eb

Violin

Viola

Viola

Violoncello

V I6/4 V7

71 reprise

I

*Alternating chords* sometimes function as pedal points as well, especially when V is 'encircled'. In the harmonic rhythm, V then is *stronger* than the other degree(s). The following example contains the final bars of the development section, and the beginning of the recapitulation of Mozart's piano sonata in A minor. Until the end of the development section, every V is on a *strong bar*, whereas every I stands on a *weak bar*. The remaining chords are on even weaker beats. Until the recapitulation, V is structurally the most important harmony; all other chords 'aim at' V:<sup>53</sup>

**example 47** Mozart, piano sonata in A minor, first movement, end of the development and beginning of the recapitulation

pedal point on the dominant (end of development section)

73

V V7 I (VII7)

<sup>53</sup> You can find the other bars of this development section in example 59.

76

V V7 I (VII7) V IIIv4/3 V IIIv4/3

79

V I

recapitulation →

*f*

Pedal points on I often can be found at the end of pieces, or at the end of a major section of a form. Such pedal points emphasize the final I, and intensify the concluding character of the preceding final cadence. Moreover, often the higher voices have a second final cadence *on top of* the pedal point. See example 45: the final tonic in bar 32 is prolonged four bars through a pedal point; the higher voices meanwhile form an 'independent', cadensing chord succession.<sup>54</sup>

Pedal points at the *beginning* of pieces - often on I - are quite common as well. On top of such tonic pedal points the higher voices then form a cadence (for example I IV V I), or form alternating tonic and dominant chords, or tonic and subdominant chords - quasi independent from the bass. See example 12 (Mozart, piano sonata in A minor, beginning of the first movement): in the first four bars of this piece we see the chords I V7 I V7 on top of a tonic pedal point.. Some pedal points are extremely long, and 'control' large parts of a piece (even a few pieces exist that are *entirely* based on a pedal point!).<sup>55</sup>

It is not unusual to **combine pedal point and fauxbourdon**: then, on top of a sustained bass, at least three voices move in parallel sixth chords. This is happening in the following example, the end of the development section of Beethoven's piano sonata in C minor, Op. 10 nr. 1. V forms the starting point and the end of the fauxbourdon (see bars 158, 162 and 166). At the end (see bars 167/168) the right hand is moving from the fauxbourdon via I6/4 and V7 to I at the beginning of the recapitulation:

**example 48**

Beethoven, piano sonata in C minor, Op. 10 nr. 1, first movement, end of the development section and beginning of the recapitulation

154

*ff* *sf* *sf* *p* *p*

faux bourdon →

dominant pedal point →

V → passing harmony →

54 Compare with example 41: the last 3 bars of the exposition of this sonata movement contain a tonic pedal point very similar to the one in example 44 (Bach).

55 To mention just a few quite extreme examples:

- the beginning of **Brahms' First Symphony** first is on a long tonic pedal point, followed by a long dominant pedal point.
- the development section of **Brahms' Third Violin Sonata** in D minor contains an 'extreme' dominant pedal point: the *whole* development is on a pedal point on A!
- the whole second movement of **Ravel's Gaspard de la Nuit** (Le Gibet) is on a pedal point.
- the whole of **Debussy's Second Piano Prelude** is based on a pedal point.

162

de - cres - cen - do

recapitulation

V V  $\xrightarrow{\text{passing harmony}}$  V I6/4 V7 I

## sequences

The general meaning of *sequence* is: repetition on a different pitch, *in the same voice(s)*. A sequence essentially differs from **imitation**: imitation is a repeat *in another voice* (on the same, or on a different pitch). Compare example 49 with example 50: example 49 contains a sequence; example 50 also contains a sequence (bar 2 is a sequence of bar 1), but an imitation as well (the lower voice imitates the upper voice).

Example 49 shows that I am using, next to the term sequence, the term “model” - as a means to indicate which notes are put into sequence later. Some theorists use the term sequence to describe the *combination* of model and sequence(s) as well - I try to avoid that though, as I believe it is quite misleading.<sup>56</sup>

We can distinguish between different *types* of sequences:

- in a **melodic sequence** the melody moves to a different pitch, but the harmony does not move along with the melody. In the example below bars 5-8 are a melodic sequence of bars 1-4 (the sequence is not entirely literal, but in principle the melody moves up a second). The harmony is not put into sequence though:

**example 49**  
Mozart, Piano  
Concerto Nr. 20  
in D minor K  
466, beginning of  
the first  
movement  
(reduction)

Allegro

model

*p*

I  $\xrightarrow{\quad\quad\quad}$  V4/3

sequence (almost literal)

5

V6/5  $\xrightarrow{\quad\quad\quad}$  I

In fact the *main bass tones* form a sequence in itself. The motion in this bass-sequence is contrary to the soprano.

I V4/3 V6/5 I

<sup>56</sup> Maybe one reason *not* to adapt this practice is the *literal* meaning of “sequence”: “what follows”, sequitur= to follow.

**example 50**  
Bach, beginning  
of the two-part  
invention in C  
major: sequence  
and imitation

The score for Example 50 shows the beginning of the two-part invention in C major. The treble clef part starts with a motif in bar 1, which is then repeated in bar 2 as a sequence (not exact). The bass clef part starts with an imitation of the motif in bar 2, which is then repeated in bar 3 as an imitation. Brackets and labels identify 'bar 1: model', 'bar 2: sequence (not exact)', 'motif', and 'imitation'.

Likewise, in the following example we see some *melodic* sequences:

**example 51** Bach, beginning of the two-part invention in Eb major

The score for Example 51 shows the beginning of the two-part invention in Eb major. The treble clef part features a model in bar 1, followed by a sequence in bar 2, and a varied sequence in bar 3. The bass clef part features a model in bar 1, followed by a sequence in bar 2, and a varied sequence in bar 3. Brackets and labels identify 'model', 'sequence', 'varied sequence', and 'model (varied)'.

- in a **harmonic sequence** a chord succession is moved up or down: a complete group of chords is repeated on a different pitch. Strictly speaking, the melody should not move together with the harmony - and it is my belief that this situation is not very common; normally the melody moves together with the harmony. An example of a harmonic sequence (I fabricated it myself):

**example 52**  
harmonic  
sequence

The score for Example 52 shows a harmonic sequence in Eb major. The treble clef part features a melody over a series of chords: G, D, Bb, and F. The bass clef part features a bass line over the same chords. Brackets and labels identify the chords: 'g', 'D', 'Bb', and 'F'.

- In a **harmonic/melodic sequence** both melody and harmony are moved.<sup>57</sup> We may stay in the same key - and then in the sequence preferably *diatonic* chords are used. We may then speak of a **non-modulating sequence**, and, when only diatonic chords are used, furthermore of a **diatonic sequence**.<sup>58</sup> It is also possible that we leave the key through moving the chord pattern. For example: when the chord succession I IV V in C major is repeated, as a sequence, as I IV V in A minor, then V in A minor is no scale degree in C major: we have modulated to the key of A minor. In this case we can speak of a **modulating sequence**. Some examples:

**example 53** Beethoven, Piano  
Sonata in E major Op. 109,  
beginning of the first movement

The score for Example 53 shows the beginning of the first movement of Beethoven's Piano Sonata in E major Op. 109. The tempo is 'Vivace ma non troppo. Sempre legato' and the time signature is 2/4. The score is marked 'p dolce'. The treble clef part features a melody over a series of chords: I, V6, VI, III6, IV, I6, V7, and I. The bass clef part features a bass line over the same chords. Brackets and labels identify the chords: 'model', 'sequens 1', 'sequens 2', and 'afsluiting (cadens)'.

<sup>57</sup> This for example normally happens in a *sequence of falling fifths*. See page 11.

<sup>58</sup> Diatonic sequences of falling fifths are a good example; see page 11, examples 11 and 12.



Example 53 contains a variant of the so-called “**Pachelbel-sequence**”, named after Johann Pachelbel’s *Kanon und Gigue in D-Dur für drei Violinen und Basso Continuo* (canon and gigue for three violins and thorough bass). Pachelbel (see example 54) wrote a three-part canon on top of a two-bar pattern in the bass, which is constantly repeated (=basso ostinato); the bass consists of the following tones:

1 – 5 – 6 – 3 – 4 – 1 – 4 – 5 – 1 .  
 |\_model\_| |\_sequence 1\_| |\_sequence 2\_|

The bass has to be harmonized, as we are dealing with a **basso continuo**. As there are no figures in the score, we can assume root positions have to be played on the basstones; this results in the degrees:

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

*example 54* Pachelbel, *Kanon und Gigue in D-Dur für drei Violinen und Basso Continuo*, beginning

In the beginning of Beethoven's sonata Op. 109 (example 53) the bass is descending stepwise, causing the appearance of alternating root positions and first inversions: I – V6 / VI – III6 / IV – I6 . Like in the Pachelbel-example, this sequence is completely diatonic

Example 55 contains modulating sequences, which is not very astonishing when we bear in mind that these bars form the beginning of a development section:

example 55 Schubert, Symphony Nr. 5 in Bb major, beginning of the development section: modulating sequence

model (in Db major) sequence 1 (in Bb minor)

Flute *pp*

Oboe *pp*

Bassoon *pp*

Violin I *pp*

Violin II *pp*

Viola *pp*

Violoncello and Double Bass *pp*

Db major I VI II6/5 V8-----7 Bb minor I VI II6/5

sequence 2 (in Gb minor)

Fl. *pp*

Ob. *pp*

Bsn. *pp*

Vln. I *pp*

Vln. II *pp*

Vla. *pp*

Vc. *pp*

Bb minor V8-----7 Gb major I VI II6/5 V8-----7 VI

## modulation, secondary functions/degrees

In most tonal compositions we encounter more than just a single key. The most important key, the **main key** or **home key**, is 'the key of the piece' (mostly indicated by the key signature). Almost all tonal pieces start and end in their main key. Some other keys have specific 'names'. Some other keys also have a specific 'name'. For instance, the key a fifth above the home key is called: **dominant key**; the key a fifth below the home key is called: **subdominant key**; keys with the same key signature are called: **parallel keys** (in major: the minor key a minor third *below*; in minor: the major key a minor third above the main key). Major and minor keys with the same root (eg C major and A minor) are called: **relative keys**.<sup>59</sup>

Transitions from one key to another are called: **modulations**. As a rule, we can assume a modulation when the new key actually is confirmed - often through a *cadence* in the new key.<sup>60</sup> When a new key only is 'suggested', or 'touched', without clear confirmation, we better do not speak of modulation, but of (temporary) **tonicization**.<sup>61</sup>

*Chromaticism within the key* (when we are not leaving the key, in spite of the use of chromatic tones) mostly is caused by **secondary functions**: a chord, or a succession of chords is as it were 'borrowed' from another key, whereas no modulation (or even: tonicization) is taking place. For example: when we use the chord D-F#-A-C (dominant seventh chord) in the key of C major, this does not necessarily mean that we are modulating: the chord may be used *within* the key of C major, with F# as chromaticism. I will come back to this topic.

In modulations often a **pivot chord** is used: a chord, forming a scale degree in both keys, and used as the central point in the modulation. Pivot chords can be labelled in both the 'old' and the 'new' keys with Roman numerals.<sup>62</sup> We could imagine the 'old' key as the 'past' of such a chord, and the new key as its 'future'. Therefore, the new key normally *is not yet audible* in the moment the pivot chord appears: we, as listeners, indeed don't know yet that a modulation is taking place (as we still hear the chord in the 'old' key). Only *later* we realize which chord did form the pivot chord in the modulation, so: where precisely the modulation took place. A little example:

*example 56* modulation (to the dominant key), with pivot chord

*cadence in A major*
*deceptive cadence*
*(final) cadence in E major (dominant key)*

A major
E major

I V2 I6 I IV V7 V6/5 I V7 VI
II II6 V V6V4/3 I I6 IV I6/4 V4 --- 3 I I

*↑*
*↑*

*pivot chord*
*pivot chord (when the repeat is played)*

It is customary (in analyses, and in harmony) to distinguish between three types of modulation:

<sup>59</sup> It is useful to know that in *Dutch* (and German, etc.) relative keys are called **parallel**. And parallel keys are called: **gelijknamig** (German: **gleichnamig**), which means: 'having the same name'.

<sup>60</sup> See pages 14 and 15.

<sup>61</sup> This is for instance common in fugues: during the second entrance of the subject (comes / answer) a modulation to the dominant key is initiated. But, as we stay in the dominant key for a very short time (because we modulate back to the home key immediately after the second entrance), we better speak of *tonicization* of the dominant.

<sup>62</sup> This is (also) visible in examples 39 and 52: at some points I used double explanations (different scale degree numbers, in different keys, one written below the other).

1. in **diatonic modulations** a chord is used that is forming a *diatonic scale degree* in both keys; in other words: a **diatonic pivot chord** is used: a chord, forming a scale degree in the 'old' key, and at the same time forming *another* scale degree in the 'new' key. The modulations in example 56 are diatonic: the F# minor chord in bar 4 is VI in A major, and appears to become II in E major. And the E major chord in bar 8 is I in E major, but as soon as the repeat is beginning it turns out that we can hear it as V in A major as well.

In example 55 something similar happens: the keys Db major, Bb minor and Gb major are connected through diatonic pivot chords; in both modulations VI changes to I in the new key (see bars 122 and 126).

It is obvious that diatonic modulations mainly occur when keys are not very far apart (meaning: their key signatures are not too distant), as in the modulation a chord, forming a scale degree in *both* keys, is used. The two keys, involved in the modulation, therefore must have at least three common tones.

2. in **enharmonic modulations** likewise a pivot chords is used, but in this case the pivot chord *may* not form a *diatonic* scale degree in one of the keys involved. In the pivot chord one or several tone(s) are enharmonized (for example: A# is written as Bb). This is called: **enharmonization**; in the modulation we find an **enharmonic pivot chord**.

In enharmonic modulations, always **partial enharmonization** is used: no more than two tones of a triad, or three tones of a seventh chord are enharmonized. In a modulation it doesn't make sense to enharmonize *all* tones of a chord (**complete enharmonization**), as then really *only the notation* is changed: when, for example, the chord F#-A#-C#-E is notated as Gb-Bb-Db-Fb, essentially nothing has changed, as the F# chord forms V7 in B, and the Gb chord in Cb. And in fact B and Cb are the same key!

Through (partial) enharmonization in a chord we get

- an identic chord, but: in *another inversion*, or
- another chord, with *identical sound*

Not all chords are suitable for enharmonization. Probably the most important are:

- diminished seventh chord
- augmented triad
- 'hard-diminished' seventh chord<sup>63</sup>

when enharmonization is used in one of these chords, the *inversion* changes (and along with that: the key in which the chord forms a - diatonic or non-diatonic - scale degree)

- dominant seventh chord; this chord may be enharmonized to a doublediminished seventh chord.<sup>64</sup>

These are by far not the only possibilities (I am leaving lots of possibilities out here...). An example, showing the chords mentioned above:

**example 57** enharmonizations in diminished, doublediminished and 'hard-diminished' seventh chords, and in the augmented triad.

diminished seventh chord:				augmented triad:			dominant seventh chord and doublediminished seventh chord:		'hard-diminished' seventh chord:	
VII7 in	VII6/5 in	VII4/3 in	VII4/3 in	IIIaugm	III6augm	III6/4augm	V7 in	#IVdv6/5	IIIhv7 in	IIIhv4/3
Eb minor	C minor	A minor	F# minor	in b minor	in Eb minor	in Eb minor	G major or	(german augm.)	C minor	in F# minor
							G minor	in F# minor		

63 This is not an English term, but literal translation of the Dutch 'hardverminderd' (or German: hartvermindert). The chord consists of major third, diminished fifth and minor seventh. The second inversion is known in English as 'French augmented'.

64 This term is not very comon in English (though it *is* used). The chord consists of diminished third, diminished fifth and diminished seventh. The first inversion is known in English as 'German augmented'.

For harmonic analysis, it is important to know that *composers often don't notate enharmonizations*. In other words: in **enharmonic pivot chords** often a single notation is chosen; normally for instance an A# is not slurred to a Bb. That enharmonic modulation is at issue then has to be derived from the context. In the following example though, Beethoven has been kind enough to indicate the enharmonization precisely:

*example 58* Beethoven, Sonata in C minor, Op. 13 "Pathétique", first movement, beginning of the development section

**Grave**

*fp* *fp* *fp* *p* *decresc.* *pp*

G minor I (VII7) V VII2 / VII4/3 I6 VII4/3 E minor VII2 I6/4 V7 (etc.)

**Allegro molto e con brio**

*p* *cresc.*

E minor I

VII in G minor is enharmonized to VII in E minor:

The following example shows the major part of the development section of Mozart's Piano Sonata in A minor<sup>65</sup>. As can be expected in a development, several modulations are taking place. The development starts in C major (the relative major key of the main key A minor), and modulates to F major after a few bars. In bars 56 and 57 V in F major (dominant seventh chord on C) is enharmonized to a doublediminished seventh chord. This enharmonization causes the modulation from F major to E minor:

*example 59* Mozart, Piano Sonate first movement, development section until dominant pedal point

C major I II2 (neighbouring chord) I F major V VII2md (neighbouring chord)

54 *f* *p* *f* *p* *f*

F major V7 VII2md (neighbouring chord) V7 VII2md (neighbouring chord) V7 is enharmonized to: E minor #IVdv6/5 (german augmented)

<sup>65</sup> You can find the last bars of this development in example 47; the beginning of the exposition is shown in example 12.

58

E minor V / dominant pedal point

61

I#3  
A minor V / dominant pedal point

64

I#3  
D minor V / dominant-orgelpunt

67

70

D minor I  
A minor IV [II] VII7col III [I] VI7 II [VII] V7

beginning of the dominant pedal point before the recapitulation

73

A minor I → #IVdv6 V

3. we speak of **chromatic modulation** when

- a chromatic step is used (for example C-C# of B-Bb) *and/or*
- a chord is used that does not form a scale degree in the 'old' key, but *does* form a scale degree in the new key.

Chromatic modulations normally do **not contain a pivot chord**: through the chromaticism we immediately leave the 'old' key, and reach the new one; the connection with the old key is suddenly lost. For example: when we are modulating from C major to D minor via the chromatic step C-C#, then the tone C belongs to the key of C major, and C# to D minor.

At a slightly larger distance though, it often *is* possible to find a relationship between the two keys: in the following example there is no pivot chord *at the actual 'modulation point'*: the tone F in bar 50 belongs to the key of Bb major, the tone F# in bar 51 belongs to the key of G minor. But, as soon as the G minor chord is reached, it is possible to perceive it (also) as VI in Bb major. Situations like this - diatonic 'connection' in the background of chromatic modulations - are very common.

**example 60** Schubert, Symphony Nr. 5 in Bb major, first movement, fragment of the transition

The musical score shows a transition from Bb major to G minor. The key signature changes from two flats to one flat and one sharp. The score includes dynamic markings like 'fz' and 'a 2.' and Roman numerals for chords: I in Bb major and V in G minor (and also VI in Bb major).

The modulations in bars 58, 62 and 66 of the development section of Mozart's piano sonata in A minor (see example 59) are to be considered as chromatic,<sup>66</sup> even when no chromatic steps are visible. The reason is that we every time *expect a minor triad* as resolutions of the preceding dominant - but a *major triad* is appearing instead (which subsequently proves to be dominant in a new key). In bars 58-70 we encounter a chord succession of falling fifths (Bmajor – Emajor – Amajor – dminor); because the first three chords appear to be dominant for the following chord we can speak of a **chromatic sequence of falling fifths** (or: **chromatic sequence of dominants**). This is followed by a (much faster) **diatonic sequence of falling fifths**<sup>67</sup> in bars 70-73.

<sup>66</sup> Apart from the *enharmonic* modulation in bars 56/57, see page. 45. Compare also example 31, bars 32/33: here the modulation is taking place via a chromatic step (in the bass).

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67 See also page 11.