OPEN MUSIC THEORY

Robin Wharton and Kris Shaffer eds.

Hybrid Pedagogy Publishing

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Open Music Theory 1e

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This text was compiled on 12/04/2025

About Open Music Theory

Inverted (or flipped) music theory

This textbook is meant to support *active student engagement with music* in the theory classroom. That means that this text is meant to take a back seat to student music making (and breaking). It is not the center of the course.

The three original authors use this textbook in the context of "inverted" or "flipped" courses, often following an inquiry-based model.

As a result, most of the pages in this textbook do not read like a typical twentieth-century textbook. They are somewhere in between prosy lecture notes and reference material, with minimal graphical or audio examples. Also, unlike many resources for "flipped" classes, there are few resources in this textbook where the core information is presented in video. We made these decisions consciously, so that this would not simply be a multimedia, web-based version of an industrial-era textbook. Rather, we wanted to create a textbook that could serve as a quick reference in the context of active musical engagement.

In our classes, student activity takes pride of place, and it often *precedes* engagement with the textbook. The information contained in this text is secondary to that activity, and thus this text is meant to play only a supporting role in our classes.

For more information about the inverted music class, see *Engaging Students: Essays in Music Pedagogy*, Volume 1 (2013) and Volume 2 (2014).

Open source

This "textbook" is an *open-source* textbook. That means that you are free to use, modify, distribute, even sell its contents provided that you 1) attribute the original to us, and 2) pass on the same rights to others (which includes us!) by licensing your derivative work the same way we license this one. (See the Creative Commons license deed linked on each page of this textbook.) In fact, we highly encourage others to "hack" this book: supplement it, reword it, add examples, drop chapters, mash it up with another one. Not only will that mean a greater diversity of material available, but if you improve your version of this work with your hacks, we can use those improvements to make this resource better, too.

If you want to "fork" this textbook, either to deploy it for your own course or to use it as the basis for your own derived work, please visit the GitHub project page, log in (or sign up), and click "fork." From there, you can edit, add, or remove the text, graphics, and videos (all text is in the very user-friendly Markdown format), or the theme (HTML and CSS). You can also send us a "pull request," if you've made a change you think would be beneficial to add to this textbook. You can even download an individual file to convert into a handout to distribute in class. For more details on the open-source ideology behind this textbook or the process of using it for your own purposes, please read Kris Shaffer's articles in *Hybrid Pedagogy*: "Open-Source Scholarship" and "Push, Pull, Fork: GitHub for Academics."

A critical textbook

Rather than create "a fixed tome of knowledge, shared across institutional boundaries, with the authority to dictate pedagogical decisions and arbitrate student success," OMT strives to be a critical textbook: "multi-authored, physically hackable, and legally alterable." We hope this textbook can "facilitate student access to existing knowledge, and empower them to critique it, dismantle it, and create new knowledge."

This means that at times (and increasingly as more contribute to the text), multiple perspectives will be provided on a single issue. Also, the license (and to the greatest extent possible, the technology) permits an instructor—and even a student—to tweak and rewrite the text. And rather than arbitrate standards across institutional boundaries, we hope that the online nature of the text, and the accompanying hashtag #OpenMusicTheory, will help build *community* across institutional boundaries, rather than uniformity.

While there are three authors and an editor listed on this text as of first "publication," we hope that the technology and the license encourage otherss to contribute new material to this volume. Though Kris, Bryn, Brian, and Robin are the original authors and editors, we have chosen a license and platform that essentially give the community of music scholars and students ownership over the textbook.

Hybrid Pedagogy Publishing

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HPP seeks to do more than simply reproduce print publishing in digital form. Rather, we ask, *what can a digital "book" do that a print book cannot?* As we state on our website,

> *Writing and reading are social acts. Hybrid Pedagogy Publishing seeks to encourage active public discourse by publishing works that are born out of, or facilitate, community (inter)action — works that are crowdsourced or collaboratively authored, openly accessible, encourage remixing and republishing, and/or blur the lines between author and reader.*

Textbooks are nearly unparalleled in the degree to which they are attached to a community. And so we hope that this textbook and the communities that use it will be a vibrant starting point for us as we re-examine what it means to read, write, and engage texts critically in a digitally connected age.

For more information about HPP, follow @HybridPub on Twitter.

Supporters

As this book grew out of a crowdfunding effort, we are proud to acknowledge those who contributed financially to the writing, editing, and designing of this book. We are extremely grateful for their support.

We are also beyond grateful to have the financial and technological support from the team at Trinket, who provided a matching donation in the amount of $2500, and who built the technology behind the interactive musical notation modules that appear in this text.

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Licensing

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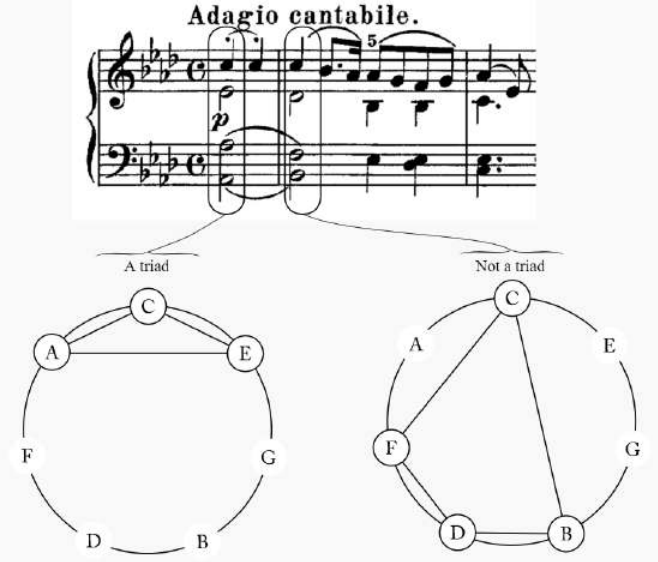
1.1: Triads and Seventh Chords

A chord is any combination of three or more pitch classes that sound simultaneously.

A three-note chord whose pitch classes can be arranged as thirds is called a *triad*.

To quickly determine whether a three-note chord is a triad, arrange the three notes on the "circle of thirds" below. The pitch classes of a triad will always sit next to each other.

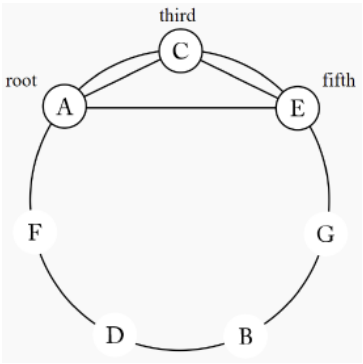


Identifying and labeling triads

Triads are identified according to their *root* and *quality*.

Triad roots

To find a triad's root, arrange the pitch classes on a circle of thirds (mentally or on paper). The root is the *lowest* in the three-pitch-class clump. Expressed another way, if the circle *ascends* by thirds as it moves clockwise, the root is the "earliest" note (thinking like a literal clock), and the other pitch classes come "later."



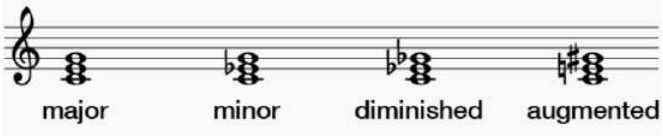
Once you know the root, you can identify the remaining notes as the *third* of the chord (a third above the root) and the *fifth* of the chord (a fifth above the root).

Triad qualities

To find a triad's quality, identify the interval between the root and the other members of the chord. There are four qualities of triads that appear in major and minor scales, each with their own characteristic intervals.

- major triad: M3 and P5 above the root (as in *do–mi–sol*)

- minor triad: m3 and P5 above the root (as in *do–me–sol* or *la–do–mi*)
- diminished triad: m3 and d5 above the root (as in *ti–re–fa*)
- augmented triad: M3 and A5 above the root (as in *me–sol–ti*)



Lead-sheet symbols

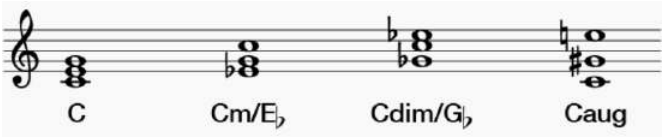
A triad can be summed up by a single symbol, such as a lead-sheet chord symbol. A lead sheet symbol includes information about both root quality, as well as which pitch class occurs in the lowest voice (called the *bass* regardless of who is singing or playing that pitch).

A lead-sheet symbol begins with a capital letter (and, if necessary, an accidental) denoting the root of the chord. That letter is followed by information about a chord's quality:

- major triad: no quality symbol is added
- minor triad: lower-case "m"
- diminished triad: lower-case "dim" or a degree sign "°"
- augmented triad: lower-case "aug" or a plus sign "+"

Finally, if a pitch class other than the chord root is the lowest note in the chord, a slash is added, followed by a capital letter denoting the pitch class in the bass (lowest) voice.

A C-major triad's lead-sheet symbol is simply **C**. A C-minor triad is **Cm**. A D-sharp-diminished triad with an F-sharp in the bass is **D#dim/F#**. And so on.



Roman numerals

Chords are often labeled according to their function within a key. One system for doing so uses Roman numerals to designate the scale degree of the chord's root. Some musicians also use Roman numerals to describe the quality of the chord. Capital Roman numerals (I, II, III, etc.) are used for major triads. Lower-case Roman numerals (i, ii, iii, etc.) are used for minor triads. Lower-case Roman numerals followed by a ° sign (ii°, vii°, etc.) are used for diminished triads. Capital Roman numerals followed by a $^+$ sign (V^+, for example) are used for augmented triads. In general, Roman numerals are generally labeled *below* the score.

(Some musicians prefer to use Roman numerals *only* to reflect the scale-degree of the chord root. In such cases, all Roman numerals are capital. In this textbook, we use all-capital Roman numerals to refer to chords generally, when quality does not matter. When notating specific chords with specific qualities, we will differentiate those qualities in the Roman numerals.)

In major keys, chords with the same Roman numeral are made up of the same scale-degrees (using the same solfège syllables), and they have the same quality. In other words, triads labeled "I" in any major key will be major triads containing *do*, *mi*, and *sol*. iii triads will be minor triads containing *mi*, *sol*, and *ti*, etc. The same is true for minor keys (though I in minor is different from I in major).

Following are the qualities and scale-degrees belonging to each triad in every major key:

- I: major – *do*, *mi*, *sol*
- ii: minor – *re*, *fa*, *la*
- iii: minor – *mi*, *sol*, *ti*
- IV: major – *fa*, *la*, *do*
- V: major – *sol*, *ti*, *re*

- vi: minor – *la*, *do*, *mi*
- vii°: diminished – *ti*, *re*, *fa*

Following are the qualities and scale-degrees belonging to each triad in every minor key:

- i: minor – *do*, *me*, *sol*
- ii°: diminished – *re*, *fa*, *le*
- III: major – *me*, *sol*, *te*
- iv: minor – *fa*, *le*, *do*
- V: major – *sol*, *ti*, *re*
- VI: major – *le*, *do*, *me*
- VII: major – *te*, *re*, *fa*
- vii°: diminished – *ti*, *re*, *fa*

Building a triad

To build a triad on the staff, identify the root, quality, and bass note from the lead-sheet symbol. The root and quality will tell you what three pitch classes belong to the triad. For example, **C**$^{+}$ tells you the root is C, and the quality is augmented. Since the quality is augmented, there is a major third above the root (E) and an augmented fifth above the root (G-sharp). Since there is no bass note appended to the lead-sheet symbol, the bass note is the same as the root: C. Write a C on the staff (in any comfortable register), then write the other chord tones (E and G-sharp) *above* the C (see the Caug triad in the above figure).

For **Cm/E♭**, the root is C, and the quality is minor. Since the quality is minor, there is a minor third above the root (E-flat) and a perfect fifth above the root (G). The slash identifies E-flat as the bass note. Write the E-flat on the staff. Then write a C and a G above it to complete the chord (again, see above).

When all the members of the triad are as close to the bass note as they can be, the chord is in what is called *close position* (C, Cm/E♭, and Cdim/G♭ above). When there are spaces between chord tones, the chord is in *open position* (Caug above). (In certain musical situations, only one of those positions will be useful or desirable.)

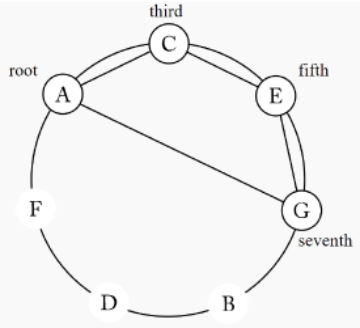
Listening to triads

Each triad quality has its own distinct sound, and to an extent that sound is preserved even when the chord is *inverted* (when the pitch classes are arranged so that a pitch class other than the root is in the lowest voice). As you practice identifying and writing triads, be sure to play the triads, both to check your analysis/writing and to develop the ability to identify chord qualities quickly by ear.

Seventh chords

A four-note chord whose pitch classes can be arranged as thirds is called a *seventh chord*.

Like with a triad, the pitch classes belonging to a seventh chord occupy adjacent positions (a four-pitch-class clump) on the circle of thirds. The four members of a seventh chord are the *root*, *third*, *fifth*, and *seventh*.



There are five qualities of seventh chords that appear in diatonic music: major seventh, dominant seventh, minor seventh, diminished seventh (also called fully-diminished), and half-diminished seventh. They are comprised of the following intervals above their roots:

- major seventh: M3, P5, and M7 above the root (or major triad with a major seventh)
- dominant seventh: M3, P5, and m7 above the root (or major triad with a minor seventh)
- minor seventh: m3, P5, and m7 above the root (or minor triad with a minor seventh)
- diminished seventh: m3, d5, and d7 above the root (or diminished triad with a diminished seventh)
- half-diminished seventh: m3, d5, and m7 above the root (or diminished triad with a minor seventh)

Following are the lead-sheet abbreviations for seventh-chord qualities:

- major seventh: maj7 or △7 (G^{maj7} or $G^{\triangle 7}$)
- dominant seventh: 7 (B^{7})
- minor seventh: m7 ($F\sharp^{m7}$)
- diminished seventh: dim7 or °7 (D^{dim7} or $D^{\circ 7}$)
- half-diminished seventh: ⦸7 ($A^{\oslash 7}$)

Roman numerals

Following are the qualities and scale-degrees belonging to each seventh chord in every major key, along with the corresponding Roman numeral reflecting those qualities:

- I^7: major seventh – *do*, *mi*, *sol*, *ti*
- ii^7: minor seventh – *re*, *fa*, *la*, *do*
- iii^7: minor seventh – *mi*, *sol*, *ti*, *re*
- IV^7: major seventh – *fa*, *la*, *do*, *mi*
- V^7: dominant seventh – *sol*, *ti*, *re*, *fa*
- vi^7: minor seventh – *la*, *do*, *mi*, *sol*
- $vii^{\oslash 7}$: half-diminished seventh – *ti*, *re*, *fa*, *la*

Following are the qualities and scale-degrees belonging to each seventh chord in every minor key, along with the corresponding Roman numeral reflecting those qualities:

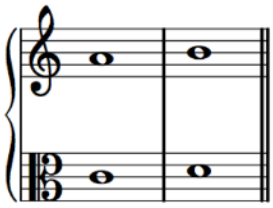
- i^7: minor seventh – *do*, *me*, *sol*, *te*
- ii^7: half-diminished seventh – *re*, *fa*, *le*, *do*
- III^7: major seventh – *me*, *sol*, *te*, *re*
- iv^7: minor seventh – *fa*, *le*, *do*, *me*
- V^7: dominant seventh – *sol*, *ti*, *re*, *fa*
- VI^7: major seventh – *le*, *do*, *me*, *sol*
- VII^7: dominant seventh – *te*, *re*, *fa*, *le*
- $vii^{\circ 7}$: diminished seventh – *ti*, *re*, *fa*, *le*

Note that major-seventh and dominant-seventh chords have the same Roman numeral nomenclature. The difference is discerned from the context of the key.

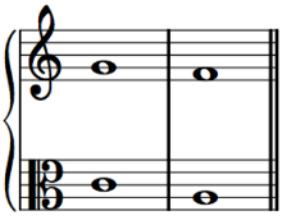
1.2: Types of Contrapuntal Motion

There are four types of contrapuntal motion between two musical lines. Differentiating these four types of motion is essential to generating good voice-leading, both strict and free.

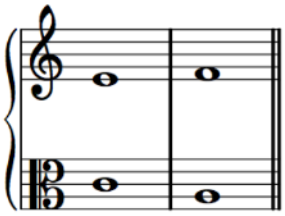
In *parallel motion*, two voices move in the same direction by the same generic interval. For example, the following two voices both move up by a step. Note also that both dyads form the same generic interval (sixth). This will always be true when two voices move in parallel motion.



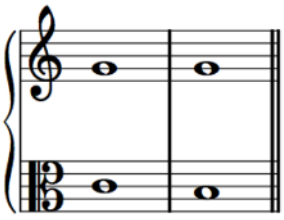
In *similar motion*, also called *direct motion*, two voices move in the same direction, but by different intervals. For example, the following two voices both move down, but the upper voice moves by step while the lower voice moves by leap. Note also that the two dyads are different generic intervals. This will always be the case with similar or direct motion.



In *contrary motion*, two voices move in opposite directions—one up, the other down.



In *oblique motion*, one voice is stationary, while the other voice moves (in either direction). The stationary tone may or may not be rearticulated.



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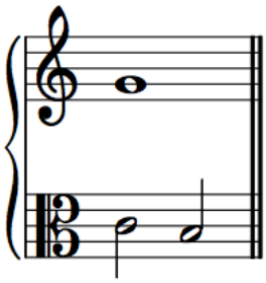
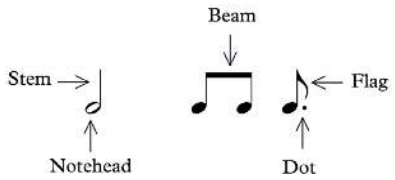


1.3: Basic Notation

Notes

When written on a staff, a note indicates a pitch and rhythmic value. The notation consists of a *notehead* (either empty or filled in), and optionally can include a *stem*, *beam*, *dot*, or *flag*.



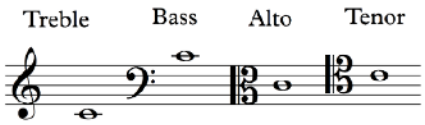
Staff

Notes can't convey their pitch information without being placed on a staff. A staff consists of five horizontal lines, evenly spaced. The plural of staff is *staves*.

Clefs

Notes *still* can't convey their pitch information if the staff doesn't include a clef. A clef indicates which pitches are assigned to the lines and spaces on a staff. The two most commonly used clefs are the *treble* and *bass* clef; others that you'll see relatively frequently are *alto* and *tenor* clef.

Here is the pitch C4 placed on the treble, bass, alto, and tenor clefs.

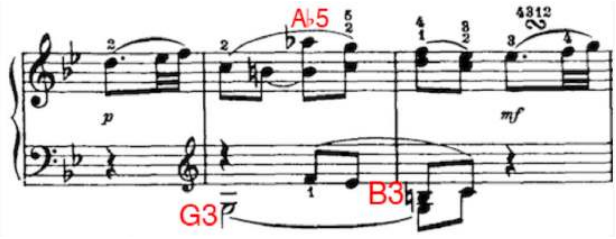


Grand staff

The grand staff consists of two staves, one that uses a treble clef, and one that uses a bass clef. The staves are connected by a curly brace. Grand staves are used frequently for notating piano music and other polyphonic instruments.

Ledger lines

When the music's range exceeds what can be written on the staff, extra lines are drawn so that we can still clearly read the pitch. These extra lines are called *ledger lines*. In the example below, From Haydn's Piano Sonata in G (Hob. XVI: 39), Ab5 occurs just above the treble staff in the right hand, and G3 and B3 occur just below the treble staff in the left hand.



Accidentals

Accidentals are used to indicate when a pitch has been raised or lowered. They are written to the *left* of the pitch.

- When you lower one of the white notes of the piano by a semitone, you add a flat.
- When you raise one of the white notes of the piano by a semitone, you add a sharp.
- When you raise a note that is already flat by a semitone, you add a natural.
- When you lower a note that is already flat by a semitone, you add a double flat.
- When you raise a note that is already sharp by a semitone, you add a double sharp.

The example below shows the symbols for flat, natural, sharp, double sharp, and double flat, respectively.

1.4: Meter and Time Signatures

Meter involves the way multiple pulse layers work together to organize music in time. Standard meters in Western music can be classified into *simple meters* and *compound meters*, as well as *duple*, *triple*, and *quadruple* meters.

Duple, triple, and quadruple classifications result from the relationship between the counting pulse and the pulses that are *slower* than the counting pulse. In other words, it is a question of *grouping*: how many beats occur in each bar. If counting-pulse beats group into twos, we have duple meter; groups of three, triple meter; groups of four, quadruple meter. Conducting patterns are determined based on these classifications.

Simple and compound classifications result from the relationship between the counting pulse and the pulses that are *faster* than the counting pulse. In other words, it is a question of *division*: does each beat divide into two equal parts, or three equal parts. Meters that divide the beat into two equal parts are *simple meters*; meters that divide the beat into three equal parts are *compound meters*.

Thus, there are six types of standard meter in Western music:

- simple duple (beats group into two, divide into two)
- simple triple (beats group into three, divide into two)
- simple quadruple (beats group into four, divide into two)
- compound duple (beats group into two, divide into three)
- compound triple (beats group into three, divide into three)
- compound quadruple (beats group into four, divide into three)

In a time signature, the *top number* (and the top number only!) describes the type of meter. Following are the top numbers that always correspond to each type of meter:

- simple duple: 2
- simple triple: 3
- simple quadruple: 4
- compound duple: 6
- compound triple: 9
- compound quadruple: 12

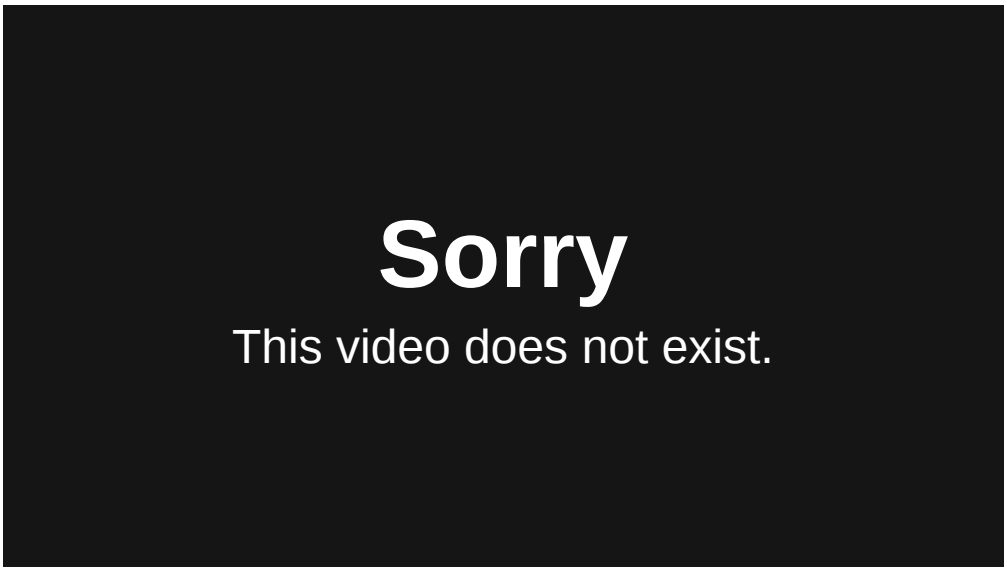
Notating meter

In *simple meters*, the bottom number of the time signature corresponds to the type of note corresponding to *a single beat*. If a simple meter is notated such that each quarter note corresponds to a beat, the bottom number of the time signature is 4. If a simple meter is notated such that each half note corresponds to a beat, the bottom number of the time signature is 2. If a simple meter is notated such that each eighth note corresponds to a beat, the bottom number of the time signature is 8. And so on.

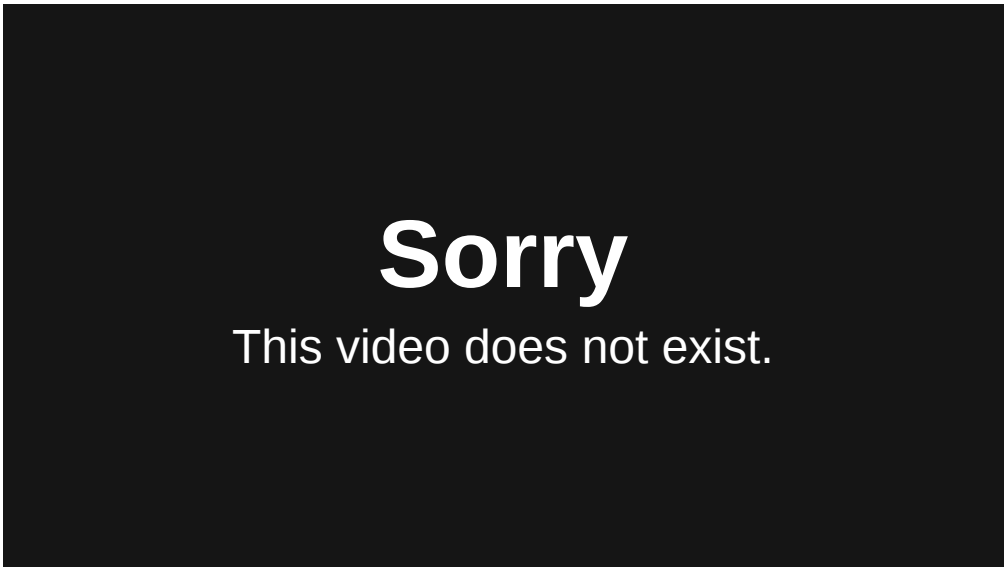
In *compound meters*, the bottom number of the time signature corresponds to the type of note corresponding to *a single division of the beat*. If a compound meter is notated such that each dotted-quarter note corresponds to a beat, the eighth note is the division of the beat, and thus the bottom number of the time signature is 8. If a compound meter is notated such that each dotted-half note corresponds to a beat, the quarter note is the division of the beat, and thus the bottom number of the time signature is 4. Note that because the beat is divided into three in a compound meter, the beat is always three times as long as the division note, and *the beat is always dotted*.

Hearing meter

For a more detailed explanation of meter with an emphasis on hearing and recognizing standard meters, see the following two videos:

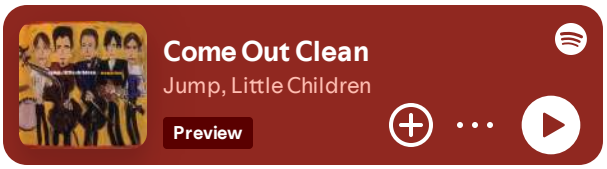


Meter - counting pulse from Kris Shaffer on Vimeo.

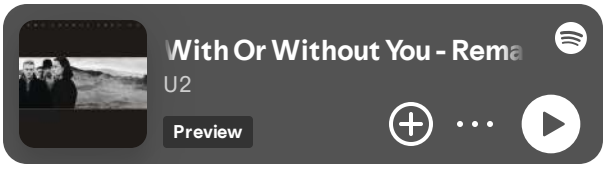


Meter - grouping and division from Kris Shaffer on Vimeo.

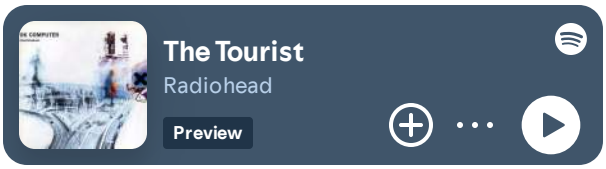
Following are the musical examples referenced in the above videos:



"Come Out Clean," Jump Little Children



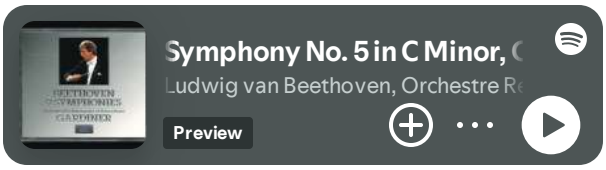
"With or Without You," U2



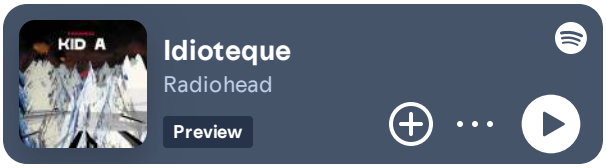
"The Tourist," Radiohead

Examples

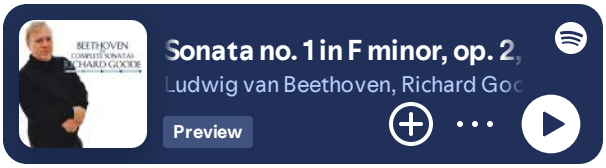
Simple duple meter



Symphony No. 5, Movement IV., Ludwig van Beethoven

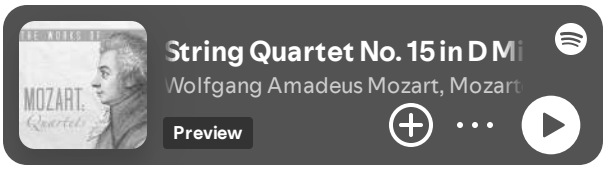


"Idioteque," Radiohead

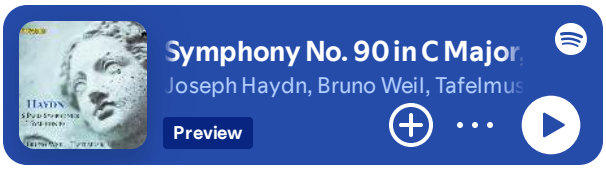


Sonata No. 1 in F Minor, Op. 2, No. 1, Movement I., Ludwig van Beethoven

Simple triple meter



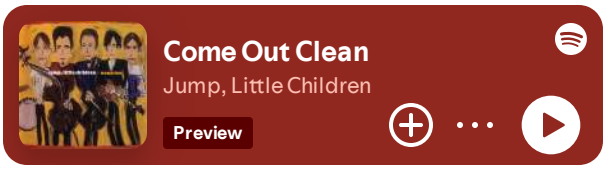
String Quartet No. 15 in D Minor, K. 421, Movement III., Wolfgang A. Mozart



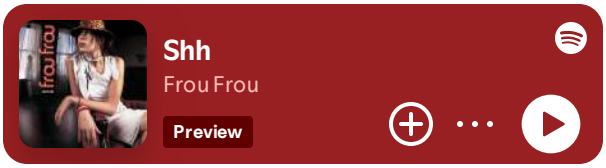
Symphony No. 90 in C Major, Hob: I:90, Movement III., Joseph Haydn

Simple quadruple meter

"With or Without You," U2

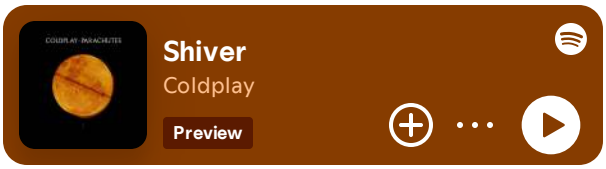


"Come Out Clean," Jump Little Children

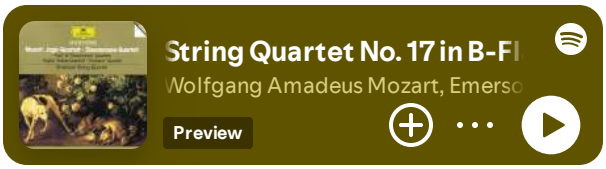


"Shh," Imogen Heap

Compound duple meter

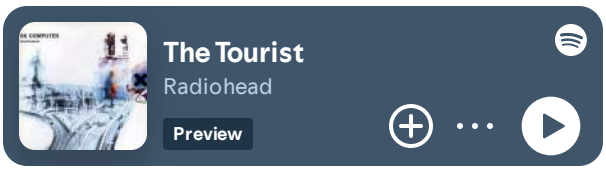


"Shiver," Radiohead

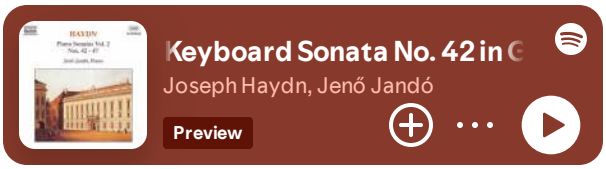


Strong Quartet No. 17 in B-flat Major, K. 458, "The Hunt," Movement I., Wolfgang A. Mozart

Compound triple meter

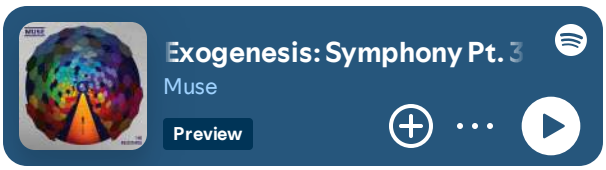


"The Tourist," Radiohead

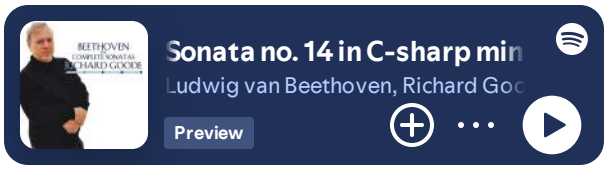


Sonata No. 42 in G Major, Hob. XVI:27, Movement II., Joseph Haydn

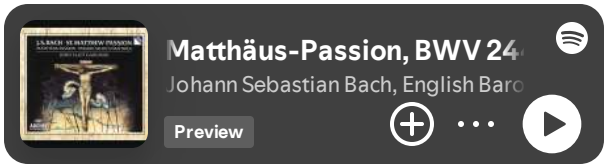
Compound quadruple meter



"Exogenesis: Symphony Part 3," Muse



Sonata No. 14 in C-sharp Minor, Op. 27, No. 2, "Moonlight," Movement I., Ludwig van Beethoven



St. Matthew Passion, No. 1, Chorus, "Kommt, ihr Töchter, helft mir klagen," J.S. Bach

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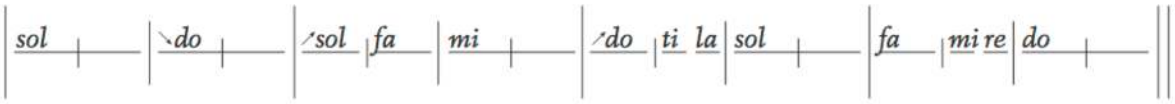
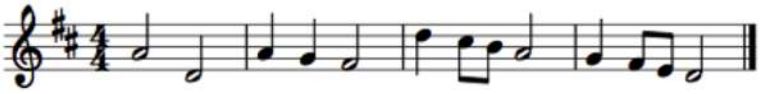
1.5: Protonotation

Protonotation is a system of musical notation stripped of complicating elements, and focusing only on basic elements of meter, rhythm, and scale degree. (This system is drawn from Gary Karpinski's *Manual for Ear Training and Sight Singing*.) Following is an example melody in both standard notation and protonotation (click images to view full size).





Note that protonotation does not contain information about *tonic*, nor the *duration of the beat* (nor, by extension, the bottom number of the time signatures). It only represents the pitch and rhythm elements that can be heard by someone without absolute pitch: meter, rhythm, and scale degree. (Mode—major or minor—can be inferred from the scale degrees.) Since it only represents what can be heard, without any additional notational factors, it is a helpful system for practicing rhythmic dictation, melodic dictation, and sight-singing.

Elements of protonotation

Following are blank protonotation grids for duple, triple, and quadruple meters.

Duple meter:

Triple meter:

Quadruple meter:

In duple and triple meter, downbeats are represented by longer vertical lines, and weak beats are represented by shorter vertical lines. In quadruple meter, the third beat of each bar is of medium strength, so it is represented by a medium-length line.

Notes are notated by using horizontal lines for rhythmic duration and moveable-*do* solfège syllables for scale degree. Arrows are used to denote the direction of any melodic leaps. (Arrows are not necessary for stepwise progressions.)

Rests are represented by the lack of horizontal line in a given beat or part of a beat. When using protonotation for transcription or dictation, however, it can be helpful to use an **X** instead of a blank, so you can distinguish a rest you are sure about from a part of the music you have left blank because you have not yet determined what is going on at that moment.

Converting protonotation to staff notation

Protonotation is not enough to produce staff notation. However, if you know 1) the clef, 2) the tonic pitch, and 3) either the beat duration or bottom number of the time signature, you can convert it to staff notation easily.

First, draw the clef provided (or choose an appropriate one based on your perception of the register of the melody) and determine the key signature from the tonic provided and the mode you heard. (Look through your melody for *mi* v. *me*.)

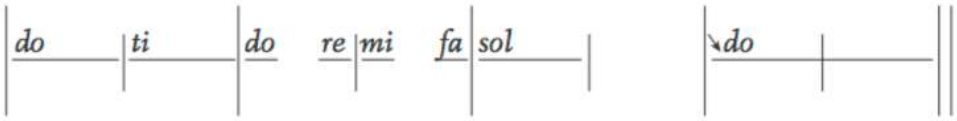
Then, determine the time signature from the beat value/bottom number provided and from the meter reflected in your protonotation. (Review the relationship of meter to time signature, if necessary.) If no bottom number is provided, choose a convenient one (**4** for simple meters and **8** for compound meters are the most typical).

Next, each of the long protonotation lines become barlines in staff notation.

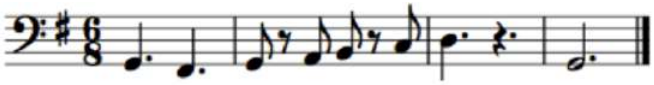
Finally insert the notes into each bar. The register, solfège syllable, and tonic will determine the pitch class. The rhythmic value will be determined by the duration of the note in beats and what the time signature implies about the duration of the beat, For example, a two-beat note in 4/4 is a half note (2 x quarter-note beat); in 2/2 is a whole note (2 x half-note beat); in 9/8 is a dotted half note (2 x dotted-quarter-note beat); and in 6/4 is a dotted whole note (2 x dotted-half-note beat).

Following are additional examples.

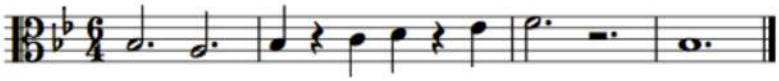
Example 1.



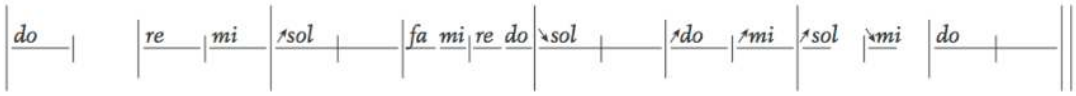
Bass clef, tonic: G, bottom number: 8.



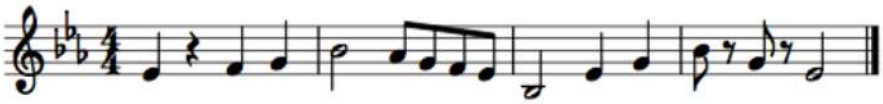
Alto clef, tonic: B-flat, bottom number: 4.



Example 2.

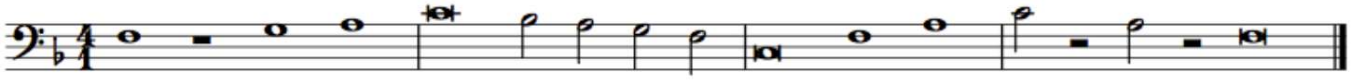


Treble clef, tonic: E-flat, bottom number: 4.



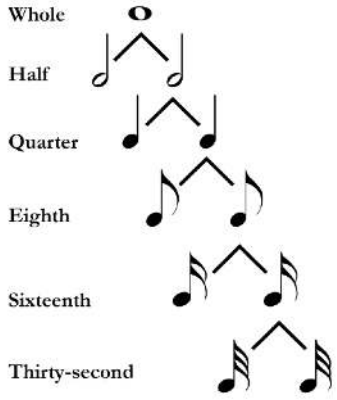
Tenor clef, tonic: C-sharp, bottom number: 8.

Bass clef, tonic: F, bottom number: 1.



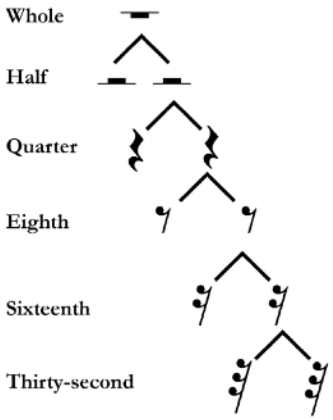
1.6: Rhythmic Values

Rhythm refers to the combination of long and short durations in time. Durations are notated with either unfilled or filled noteheads. Unfilled noteheads can appear with or without a stem; filled noteheads always appear with a stem. Flags can be added to the stems of filled noteheads; each flag shortens the duration by half.



Rests

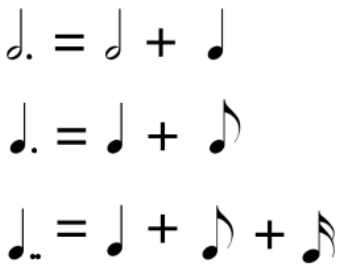
Rests represent silence in musical notation. For each durational symbol there exists a corresponding rest.



Dots and ties

Dots and ties allow for basic durations to be lengthened. A dot occurs after a pitch or a rest, and it increases its duration by half. For example, if a quarter note is equivalent in duration to two eighth notes, a dotted quarter note would be equivalent to *three* eighth notes. Generally, undotted notes divide into two notes; dotted notes divide into three. Thus, undotted notes are typically used to represent the beat level in simple meter, while dotted notes are used to represent the beat in compound meter.

Multiple dots can be added to a duration. Subsequent dots add half the duration of the previous dot. For example, a quarter note with two dots would be equivalent in duration to a quarter, eighth, and sixteenth note.



A *tie* lengthens a duration by connecting two adjacent identical pitches. Ties are used to either sustain a pitch beyond the length of a single measure, or to make a particular rhythmic grouping in a measure more clear.

In the example below, the duration of the first pitch is longer than a single measure, so it is represented by tying the dotted half note, which lasts the full measure, to the first beat of the subsequent measure.

1.7: Beams and Borrowed Divisions

Beams

It's important to remember that notation is intended to be read by performers. You should always strive to make your notation as easy to interpret as possible. Part of this includes grouping the rhythms such that they convey the beat unit and the beat division. *Beams* are used to group any notes at the beat division level or shorter that fall within the same beat.

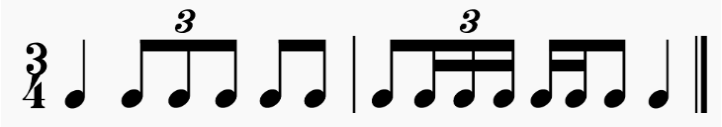
In this example, the eighth notes are not grouped with beams, making it difficult to interpret the triple meter.

If we re-notate the above example so that the notes that fall within the same beat are grouped together with a beam, it makes the music much easier to read.

Borrowed divisions

Typically, a meter is defined by the presence of a consistent beat division: division by two in simple meter, and by three in compound meter. Occasionally, composers will use a triple division of the beat in a simple meter, or a duple division of the beat in a compound meter.

Triplets are borrowed from compound meter, and may occur at both the beat division and subdivision levels, as seen below.

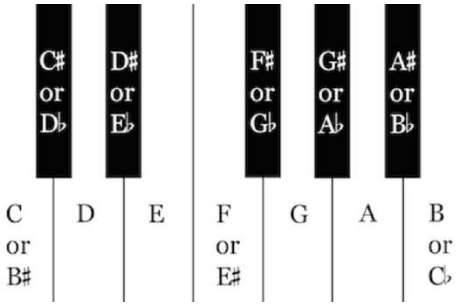


Likewise, *duplets* can be imported from simple meter into a compound meter.

1.8: Pitches and Octave Designations

The Keyboard

The keyboard is great for helping you develop a visual, aural, and tactile understanding of music theory. On the illustration below, the *pitch-class* letter names are written on the keyboard.



Enharmonic Equivalence

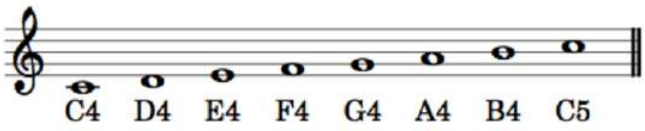
Notice that some of the keys have two names. When two pitch classes share a key on the keyboard, they are said to have *enharmonic equivalence*. Theoretically, each key could have several names (the note C could also be considered D𝄫, for instance), but it's usually not necessary to know more than two enharmonic spellings.

Octave Designation

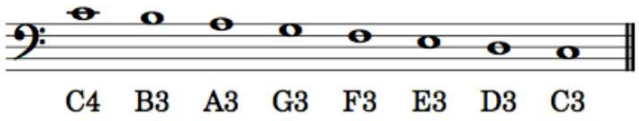
When specifying a particular pitch precisely, we also need to know the *register*. In fact, if all you have is C-sharp or B-flat, you do not have a *pitch*, you have a *pitch-class*. A pitch-class plus a register together designate a specific pitch.

We will follow the International Standards Organization (ISO) system for register designations. In that system, middle C (the first ledger line above the bass staff or the first ledger line below the treble staff) is C4. An octave higher than middle C is C5, and an octave lower than middle C is C3.

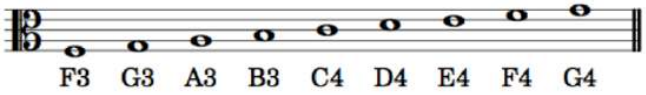
The tricky bit about this system is that the octave starts on C and ends on B. So an ascending scale from middle C contains the following pitch designations:



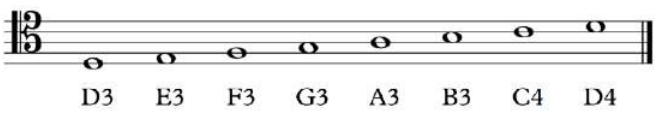
And a descending scale from middle C contains the following pitch designations:



Pitches on the alto staff are as follows:



Pitches on the tenor staff are as follows:



Any accidentals follow the octave designation of the natural pitch with the same generic name. Thus a half step below C4 is C-flat4 (even though it sounds the same as B3), and a half step above C4 is C-sharp4.

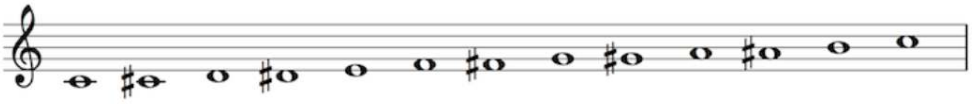
Note that a complete designation contains both the pitch-class name (a letter name plus an optional sharp or flat) and the register (the ISO number indicating the octave in which the pitch is found). Unless both are present, you do not have the full designation of a specific pitch.

1.9: Scales and Scale Degrees

A scale is a succession of pitches ascending or descending in steps. There are two types of steps: *half steps* and *whole steps*. A half step (H) consists of two adjacent pitches on the keyboard. A whole step (W) consists of two half steps. Usually, the pitches in a scale are each notated with different letter names, though this isn't always possible or desirable.

The Chromatic Scale

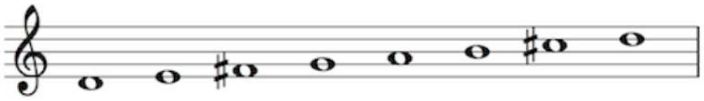
The chromatic scale consists entirely of half steps, and uses every pitch on the keyboard within a single octave. Here is the chromatic scale that spans the pitches C4 through C5.



The major scale

A major scale, a sound with which you are undoubtedly familiar, consists of seven whole (W) and half (H) steps in the following succession: W-W-H-W-W-W-H. The first pitch of the scale, called the *tonic*, is the pitch upon which the rest of the scale is based. When the scale ascends, the tonic is repeated at the end an octave higher.

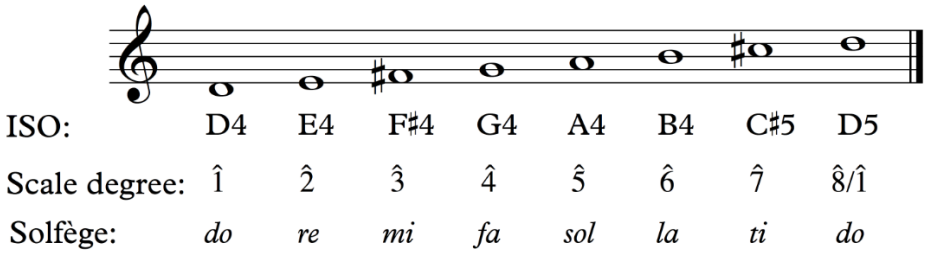
Here is the D major scale. It is called the "D major scale" because the pitch D is the *tonic* and is heard at both ends of the scale.



Scale degrees and solfège

While ISO notation allows us to label a pitch in its specific register, it is often useful to know where that pitch fits within a given scale. For example, the pitch class D is the first (and last) note of the D-major scale. The pitch class A is the fifth note of the D-major scale. When described in this way, we call the notes *scale degrees*, because they're placed in context of a specific scale. Solfège syllables, a centuries-old method of teaching pitch and sight singing, can also be used to represent scale degrees (when used in this way, this system is specifically called movable-*do* solfège).

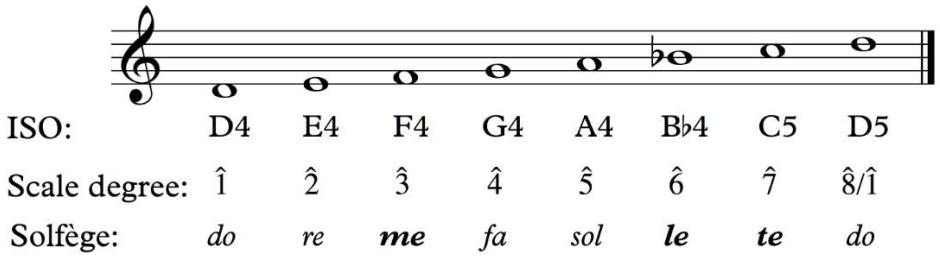
Scale degrees are labeled with Arabic numerals and carets (^). The illustration below shows a D-major scale and corresponding ISO notation, scale degrees, and solfège syllables.



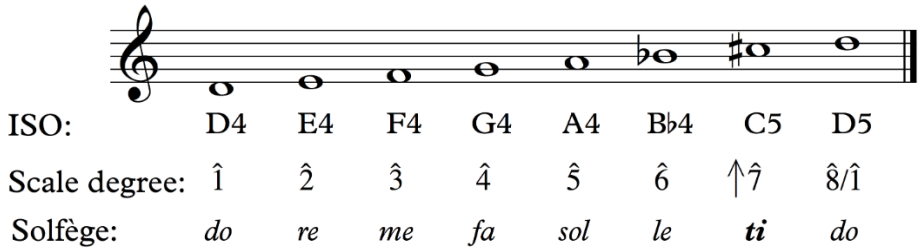
The minor scale

Another scale with which you are likely very familiar is the minor scale. There are several scales that one might describe as *minor*, all of which have a characteristic third scale degree that is lower than the one found in the major scale. The minor scale most frequently used in tonal music from the Common Practice period is based on the *aeolian mode* (you'll read more about modes later), which is sometimes referred to as the *natural minor* scale.

The natural minor scale consists of seven whole (W) and half (H) steps in the following succession: W-H-W-W-H-W-W. Note the changes in solfège syllables.

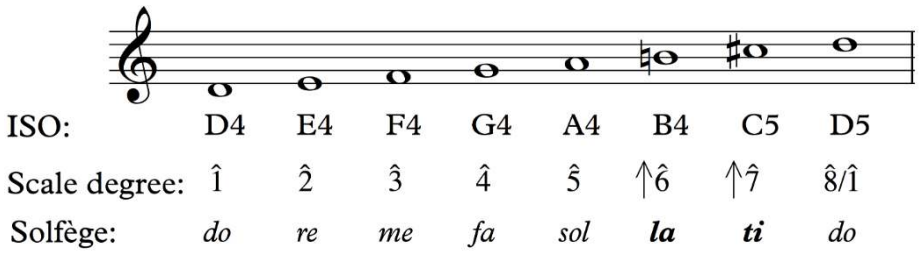


If you sing through the above example, you'll notice that the ending lacks the same sense of closure you heard in the major scale. This closure is created in the major scale, in part, by the ascending semitone between *ti* and *do*. Composers often want to have this sense of closure when using the minor mode, too. They're able to achieve this by applying an accidental to the seventh scale degree, raising it by a semitone. If you do this within the context of the natural minor scale, you get something called the *harmonic minor* scale.

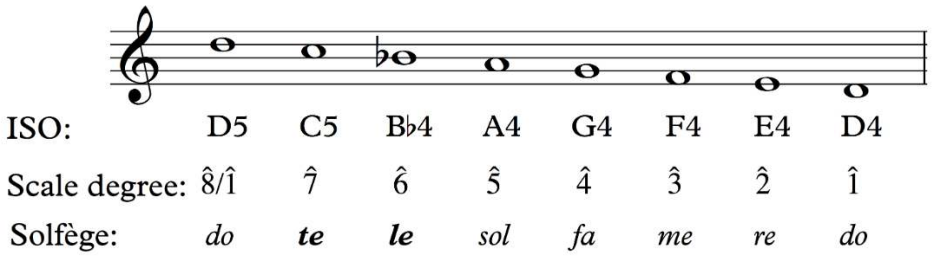


Now the last two notes of the scale sound much more conclusive, but you might have found it difficult to sing *le* to *ti*. When writing melodies in a minor key, composers often "corrected" this by raising *le* by a semitone to become *la* when approaching the note *ti*. When the melody descended from *do*, the closure from *ti* to *do* isn't needed; likewise, it is no longer necessary to "correct" *le*, so the natural form of the minor scale is used again. Together, these different ascending and descending versions are called the *melodic minor* scale.

When ascending, the *melodic minor* scale uses *la* and *ti*.



When descending, the *melodic minor* scale uses the "natural" *te* and *le*.

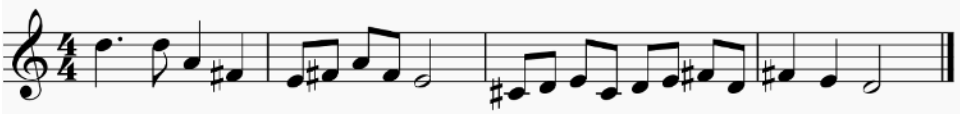


Truth be told, most composers don't really think about three different "forms" of the minor scale. The *harmonic minor* scale simply represents composers' tendency to use *ti* when building harmonies that include the seventh scale degree in the minor mode. Likewise, the *melodic minor* scale is derived from composers' desire to avoid the melodic augmented second interval (more on this in the intervals section) between *le* and *ti* (and some chose not to avoid this!). In reality, there is only one "version" of the minor scale. Context determines when a composer might use *la* and *ti* when writing music in a minor key.

1.10: Key Signatures

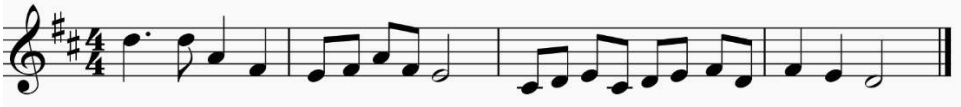
When you're writing in a single key for an extended period of time, it gets tedious to write out the accidentals over and over again.

Here is a simple melody in D major, without a key signature.



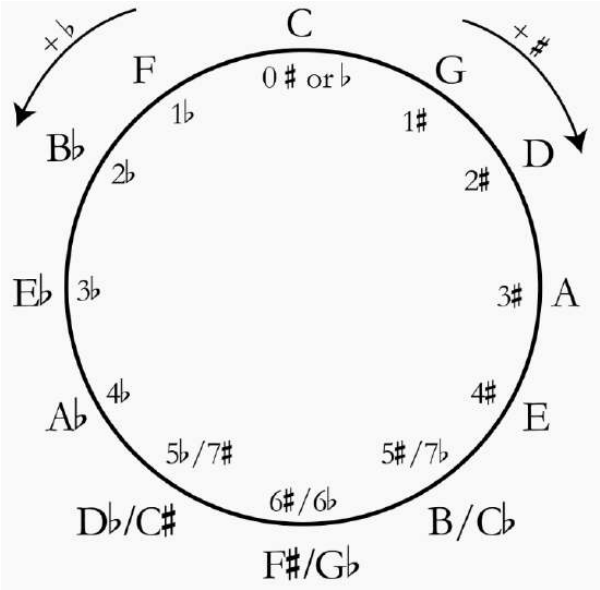
To avoid this, composers used *key signatures* at the beginning of each staff to remind performers of which pitch classes should have flats or sharps.

Here is the same melody, with the key signature at the beginning of the staff to remind the performer that F and C should be sharp.



The circle of fifths

The circle of fifths is an illustration that has been used in music theory pedagogy for hundreds of years. It conveniently summarizes the key signature needed for any key with up to seven flats or sharps.



But *which* notes are flat or sharp in a key? To properly use the circle of fifths to figure out a key signature, you'll need to also remember this mnemonic device, which tells you the order of flats and sharps:

Father **C**harles **G**oes **D**own **A**nd **E**nds **B**attle.

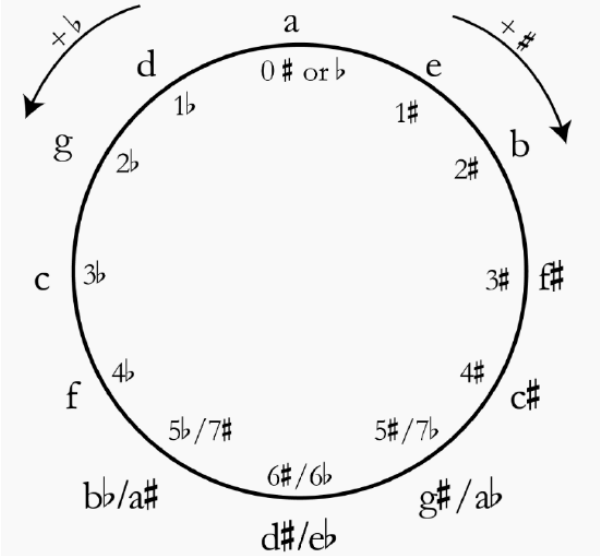
For sharp keys (clockwise on the circle of fifths), read the mnemonic device forward. For example, the circle of fifths tells us that there are 3 sharps in the key of A major. Which three notes are sharp? The first three notes in the mnemonic device: F(ather), C(harles), and G(oes).

For flat keys (counter-clockwise on the circle of fifths), read the mnemonic device backwards. For example, the circle of fifths tells us that the key of A-flat major has four flats. Which flats? Reading backwards: B(attle), E(nds), A(nd), D(own).

Minor key signatures

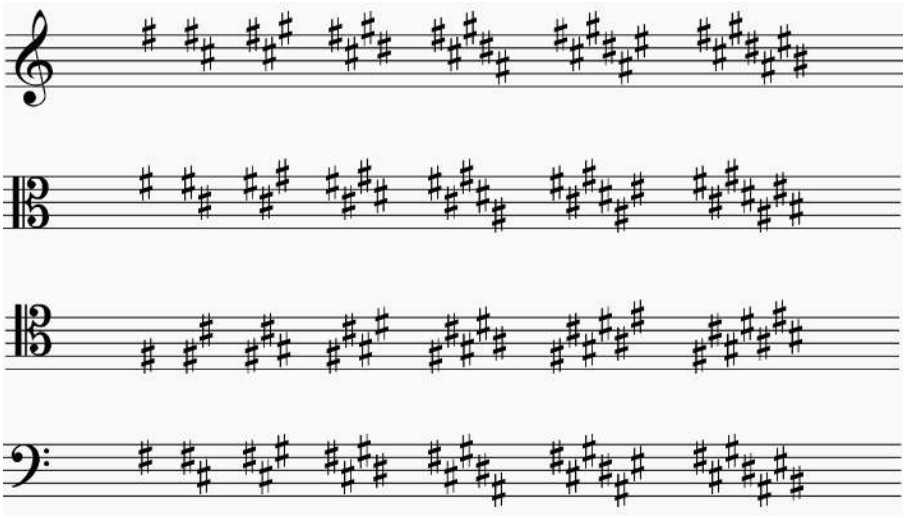
Of course, minor keys can use key signatures, too. In fact, for each major key signature, there is a corresponding minor key that shares its signature. Major and minor keys that share the same key signature are called *relative* keys. For example, both C major

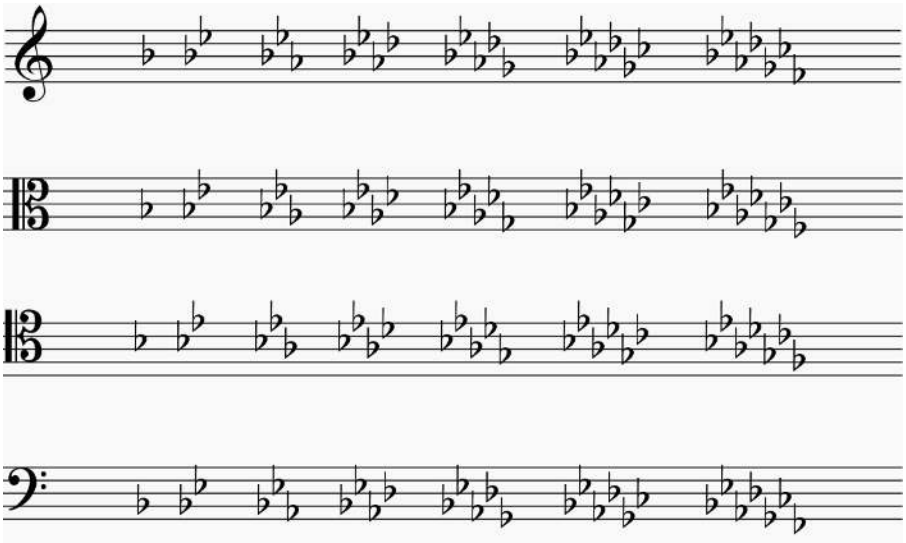
and A minor have zero sharps or flats. A minor is considered the *relative minor* of C major; likewise, C major is considered the *relative major* of A minor. Compare the minor key circle of fifths below with the major key circle of fifths above, and you'll see the remaining relative key pairs.



Writing key signatures

Below is a reference that shows how all of the key signatures should be written on treble, alto, tenor, and bass clefs.





1.11: Intervals and Dyads

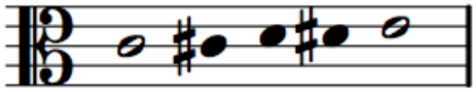
An *interval* is the distance between two pitches, usually measured as a number of steps on a scale.

A *dyad* is a pair of pitches sounding together (in other words, a two-note chord). Since a dyad is defined by the interval between the two pitches, dyads are often simply called intervals.

Thus, the term *interval* regularly refers both to the distance between two pitches on a scale and to a dyad whose pitches are separated by that distance.

Chromatic intervals

The simplest way to measure intervals, particularly at the keyboard, is to count the number of half-steps, or *semitones*, between two pitches. To determine the chromatic interval between C4 and E4, for example, start at C4 and ascend the chromatic scale to E4, counting steps along the way: C#4, D4, D#4, E4. E4 is four semitones higher than C4. Chromatic intervals are notated with a lower-case **i** followed by an Arabic numeral for the number of semitones. C4–E4 is four semitones, or **i4**.

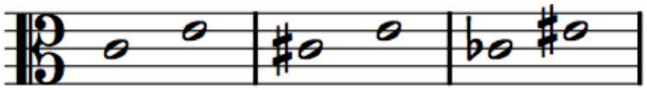


Diatonic intervals

More commonly for tonal music, we are interested in the number of steps on the diatonic (major or minor) scale. This is a bit tricky—not because it's difficult, but because it's counterintuitive. Unfortunately, the system is too old and well engrained to change it now! But once you get past the initial strangeness, diatonic intervals are manageable.

When identifying a diatonic interval, begin with the *letter names only*. That is, treat C, C-sharp, and C-flat all as *C* for the time being. Next, count the number of steps (different letters) between the two pitches in question, *including both pitches in your count*. This gives you the *generic interval*.

For example, from C4 to E4, counting both C and E, there are three diatonic steps (three letter names): C, D, E. Thus, the generic interval for C4–E4 is a *third*. The same is true for any C to any E: C#4 to E4, Cb4 to E#4, etc. They are all diatonic thirds.



Often more specificity is needed than generic intervals can provide. That specificity comes in the form of an interval's *quality*. Combining *quality* with a generic interval name produces a *specific interval*.

There are five possible interval qualities:

- augmented (A)
- major (M)
- perfect (P)
- minor (m)
- diminished (d)

To obtain an interval's quality, find both the generic interval and the chromatic interval. Then consult the following table to find the specific interval.

	UNIS.	2ND	3RD	4TH	5TH	6TH	7TH	OCT.
i0	P1	d2						
i1	A1	m2						
i2		M2	d3					
i3		A2	m3					
i4			M3	d4				
i5			A3	P4				
i6				A4	d5			
i7					P5	d6		
i8					A5	m6		
i9						M6	d7	
i10						A6	m7	
i11							M7	d8
i12							A7	P8

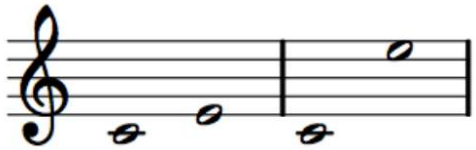
For example, C4–E4 is a generic third, and has a chromatic interval of i4. A third that encompasses four semitones is a *major third* (M3). Note that both generic interval and chromatic interval are necessary to find the specific interval, since there are multiple specific diatonic intervals for each generic interval and for each chromatic interval.

Note that some generic intervals can be augmented, perfect, or diminished, and other intervals can be augmented, major, minor, or diminished. There is no generic interval that can be both major/minor and perfect; if it can be major or minor, it cannot be perfect, and if it can be perfect, it cannot be major or minor. An augmented version of an interval is always one semitone wider than major or perfect; diminished is always one semitone smaller than minor or perfect.

Solfège can also help to determine the specific interval. Each pair of solfège syllables will have the same interval, no matter what the key, as long as it is clear which syllable is the lower pitch and which is the upper pitch. Memorizing the intervals between solfège pairs can help speed along your analysis of dyads as they appear in music. For example, knowing that *do–mi*, *fa–la*, and *sol–ti* are always major thirds and knowing that *re–fa*, *mi–sol*, *la–do*, and *ti–re* are always minor thirds will allow for faster analysis of dyads in major keys.

Compound intervals

The intervals discussed above, from unison to octave, are called *simple intervals*. Any interval larger than an octave is considered a *compound interval*. Take the interval C4 to E5. The generic interval is a tenth. However, it functions the same as C4 to E4 in almost all musical circumstances. Thus, the tenth C4–E5 is also called a *compound third*. A compound interval takes the same quality as the corresponding simple interval. If C4–E4 is a major third, then C4–E5 is a major tenth.

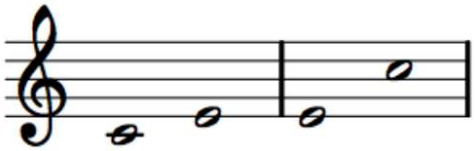


Interval inversion

In addition to C4–E4 and C4–E5, E4–C5 also shares a similar sound and musical function. In fact, any dyad that keeps the same two pitch classes but changes register will have a similar sound and function. However, the fact that E4–C5 has E as its lowest pitch instead of C means that it has a different generic interval: E4–C5 is a sixth, not a third. Because of that difference, it will also play a different musical function in some circumstances. However, there is no escaping the relationship.

Dyads formed by the same two pitch classes, but with different pitch classes on bottom and on top, are said to be *inversions* of each other, because the pitch classes are *inverted*. Likewise, the intervals marked off by those inverted dyads are said to be *inversions* of each other.

Again, take C4–E4 (major third) and E4–C5 (minor sixth). These two dyads have the same two pitch classes, but one has C on bottom and E on top, while the other has E on bottom and C on top. Thus, they are inversions of each other.



Three relationships exhibited by these two dyads hold for all interval inversions.

First, the chromatic intervals add up to 12. (C4–E4 = i4; E4–C5 = i8; i4 + i8 = i12) This is because the two intervals add up to an octave (with an overlap on E4).

Second, *the two generic interval values add up to nine* (a third plus a sixth, or 3 + 6). This is because the two intervals add up to an octave (8), and one of the notes is counted twice when you add them together. (Remember the counterintuitive way of counting off diatonic intervals, where the number includes the starting and ending pitches, and when combining inverted intervals, there is always one note that gets counted twice—in this case, E4.)

Lastly, the major interval inverts into a minor, and vice versa. This always holds for interval inversion. Likewise, an augmented interval's inversion is always diminished, and vice versa. A perfect interval's inversion is always perfect.

> *major* ↔ *minor*
> *augmented* ↔ *diminished*
> *perfect* ↔ *perfect*

Interval inversion may seem confusing and esoteric now, but it will be an incredibly important concept for the study of voice-leading and the study of harmony.

Methods for learning intervals

There are several methods for learning intervals. Choose your favorite:

- The white-key method

Melodic and harmonic intervals

The last distinction between interval types to note is *melodic* v. *harmonic* intervals. This distinction is simple. If the two pitches of a dyad sound at the same time (a two-note chord), the interval between them is a *harmonic interval*. If the two pitches in question are sounded back-to-back (as in a melody), the interval between them is a *melodic interval*. This distinction is important in voice-leading, where different intervals are preferred or forbidden in harmonic contexts than in melodic contexts. The difference is also important for listening, as hearing melodic and harmonic intervals of the same quality requires different techniques.

Consonance and dissonance

Intervals are categorized as *consonant* or *dissonant* based on their sound (how stable, sweet, or harsh they sound), how easy they are to sing, and how they best function in a passage (beginning, middle, end; between certain other intervals; etc.). Different standards apply to melody and harmony. The following categories will be essential for your work in strict voice-leading, and they will be a helpful guide for free composition and arranging work, as well.

Melodic consonance and dissonance

The following *melodic* intervals are *consonant*, and can be used in strict voice-leading both for successive pitches and as boundaries of stepwise progressions in a single direction:

- All perfect intervals (P4, P5, P8)
- All diatonic steps (M2, m2)
- Major and minor thirds
- Major and minor sixths

All other *melodic* intervals are *dissonant*, and must be avoided for successive pitches and as boundaries of stepwise progressions in a single direction, including:

- All augmented and diminished intervals (including those that are enharmonically equivalent to consonant intervals, such as A2 and A1)
- All sevenths

Harmonic consonance and dissonance

The following *harmonic* intervals are *imperfect consonances*, and can be used relatively freely in strict voice-leading (except for beginnings and endings):

- Major and minor thirds
- Major and minor sixths

The following *harmonic* intervals are *perfect consonances*, and must be used with care in limited circumstances in strict voice-leading:

- All perfect intervals *except the perfect fourth* (P1, P5, P8)

All other *harmonic* intervals are *dissonant*, and must be employed in very specific ways in strict voice-leading, including:

- All diatonic steps (M2, m2)
- All augmented and diminished intervals (including those that are enharmonically equivalent to consonant intervals, such as A2 and A1)
- All sevenths
- Perfect fourths

CHAPTER OVERVIEW

2: Voice-Leading and Model Composition

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2.2: Strict Two-Voice Composition (Species Counterpoint) - Composing a cantus firmus
2.3: Strict Two-Voice Composition - Composing a First-Species Counterpoint
2.4: Strict Two-Voice Composition - Composing a Second-Species Counterpoint
2.5: Strict Two-Voice Composition - Composing a Third-Species Counterpoint
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2.17: Strict Four-Voice Composition - Realizing an Unfigured Bass Line
2.18: Strict Four-Voice Composition - Embellishing Tones

2.1: Introduction to Strict Voice-Leading

The study of the theory of Western music involves three main components: voice-leading, harmony, and form. *Voice-leading* deals with the relationship of two or more musical lines (or melodies) combined into a single musical idea. *Harmony* addresses the rules or norms for combining chords into successions. *Form* addresses the rules or norms for the combination of phrases and other small musical units into larger units—including whole movements and works.

We will address all three of these facets of musical theory. However, of the three, voice-leading is the most fundamental. Thus, we begin our study of music theory, then, with *strict voice-leading*, or *counterpoint*.

Twentieth-century musician and theorist, Heinrich Schenker, wrote:

> *The purpose of counterpoint, rather than to teach a specific style of composition, is to lead the ear of the serious student of music for the first time into the infinite world of fundamental musical problems (Kontrapunkt, p. 10).*

Following this line of thinking, our early voice-leading exercises will not be in a specific style (classical, baroque, romantic, pop/rock, etc.). Instead, these exercises will eliminate important musical elements like *harmony*, *orchestration*, *melodic motives*, *formal structure*, and even many elements of *rhythm*, in order to focus very specifically on a small set of musical problems. These other elements of music will be introduced one-by-one as we progress through the course (and into future courses).

The "fundamental musical problems" we will address in the study of counterpoint center around the way in which some basic principles of auditory perception and cognition (how the brain perceives and conceptualizes sound) play out in Western musical structure. For example, our brains tend to assume that sounds similar in pitch or timbre come from the same source. Our brains also listen for patterns, and when a new sound continues or completes a previously heard pattern, it assumes that the new sound belongs together with those others. On the other hand, the breaking of these regularities in the sonic environment can signal danger, or at the very least the need for heightened attention to be applied to the sonic "culprit." Identifying irregularities in the sonic environment and boosting attention and adrenaline when one is found have been absolutely essential to the survival of the human species. These abilities are also what allows music to have the emotional effect that it does on so many people. Whether or not a composer or songwriter is aware of the science and psychology of hearing, a masterful composer mediates and plays with these basic concepts.

"Mediates" and "plays" are important ideas here. Music that simply makes it easy for the brain to parse and process sound is boring—it calls for no heightened attention, it doesn't increase our heart rate, make the hair on the back of our neck stand up, or give us a little jolt of dopamine. On the other hand, music that constantly activates our innate sense of danger is hardly pleasant for most listeners. Thus, fundamental to most of the music we will study is the dance between tension and relaxation, motion and rest.

The study of counterpoint will help us to engage several important musical "problems" in a limited context, so that we can master them compositionally and understand them analytically. Those problems arise as we seek to bring the following traits together:

- smoothness
- independence and integrity or melodic lines
- tonal fusion (the preference for simultaneous notes to form a consonant unity)
- variety
- motion (towards a goal)

These traits are based in human perception and cognition, but they are often in conflict in specific musical moments, and need to be balanced over the course of larger passages and complete works. Counterpoint will help us begin to practice mediating these conflicts.

Also, note Schenker's expression "lead the ear." Counterpoint is not a pencil-and-paper (or lecture-and-homework) study. Rather, the exercises are mini- (micro-? nano-?) compositions that must be *performed*—with voice and/or keyboard, often with a partner—so that the ear, the fingers, the throat, and ultimately the mind can internalize the sound, sight, and feel of good (and bad) musical lines, and good (and bad) combinations of musical lines.

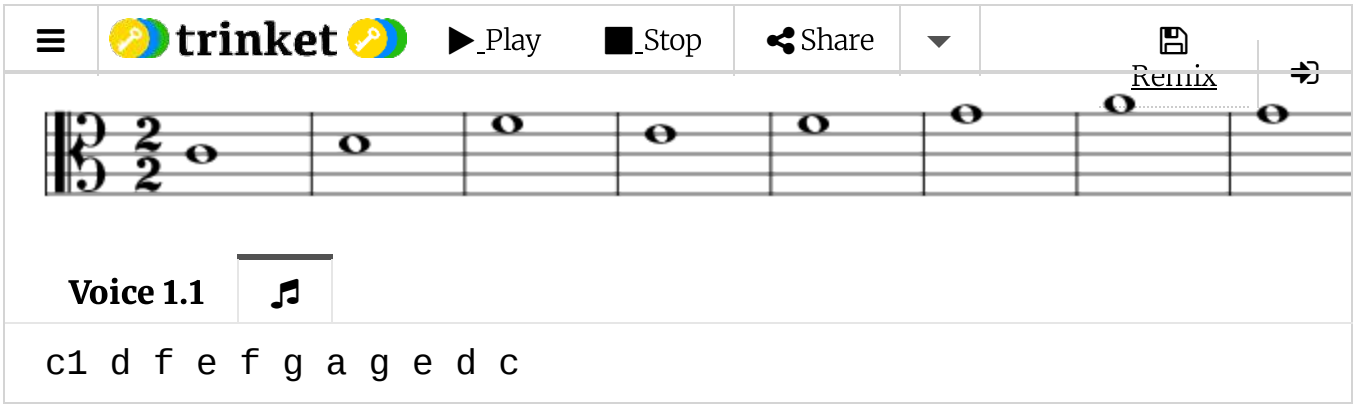
The specific method we will use is called *species counterpoint*—so called because the study progresses through stages, or species, where one or two new musical "problems" are introduced. This approach has existed in some form since the early seventeenth century. The specific method we will use is very close to that articulated by Johann Joseph Fux, in his *Gradus ad parnassum* (*Steps to Parnassus*, 1725). Master composers from the eighteenth to the twenty-first centuries have used this method, or some variation on it. While Fux proposed five species, moving from two-voice combinations up to six- and eight-voice combinations, we will focus on species one through four, in two voices only.

2.2: Strict Two-Voice Composition (Species Counterpoint) - Composing a cantus firmus

Exercises in strict voice-leading, or species counterpoint, begin with a single, well formed musical line called the *cantus firmus* (fixed voice, or fixed melody; pl. *cantus firmi*). *Cantus firmus* composition gives us the opportunity to engage the following fundamental musical traits:

- smoothness
- independence and integrity or melodic lines
- variety
- motion (towards a goal)

Our first exercises in strict voice-leading will be to compose good, well formed *cantus firmi*. The first step is to perform and analyze model *cantus firmi*, such as the following *cantus firmus* in C major, composed by Heinrich Schenker.



A number of others are provided here. Performing these is a helpful practice to develop an internal sense of the sound and feel of a well formed *cantus*, and many of the characteristics of well formed *cantus firmi* carry over into other musical styles. (These model *cantus firmi* can also be used as the starting points for our two-voice exercises.)

From these *cantus*, notice how the general musical characteristics of smoothness, melodic integrity, variety, and motion towards a goal are worked out in specific characteristics. The following characteristics are typical of all well formed *cantus firmi*:

- length of about 8–16 notes
- arhythmic (all whole notes; no long or short notes)
- begin and end on *do*
- approach final tonic by step (usually *re–do*, sometimes *ti–do*)
- all note-to-note progressions are melodic consonances
- range (interval between lowest and highest notes) of no more than a tenth, usually less than an octave
- a single climax (high point) that appears only once in the melody
- clear logical connection and smooth shape from beginning to climax to ending
- mostly stepwise motion, but with some leaps (mostly small leaps)
- no repetition of “motives” or “licks”
- any large leaps (fourth or larger) are followed by step in opposite direction
- no more than two leaps in a row; no consecutive leaps in the same direction (Fux’s F-major *cantus* is an exception, where the back-to-back descending leaps outline a consonant triad.)
- the leading tone progresses to the tonic
- in minor, the leading tone only appears in the penultimate bar; the raised submediant is only used when progressing to that leading tone

Melodic tendencies

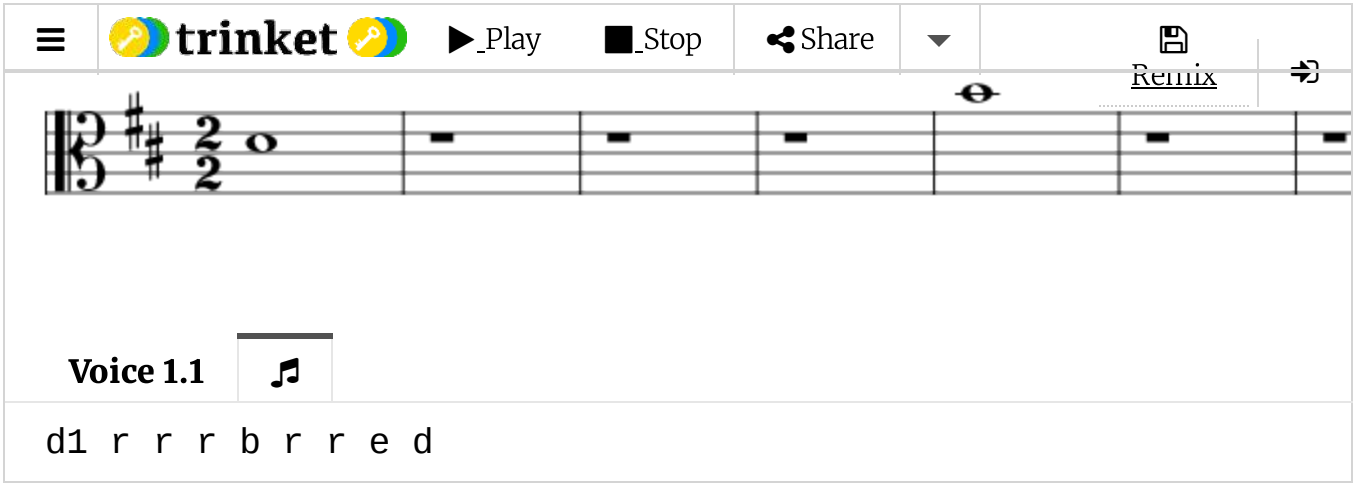
The characteristics listed above are fairly detailed, and some of them are specific to strict species counterpoint. However, taken together, they express in detail some general tendencies of melodies in a variety of styles.

David Huron identifies five general properties of melodies in Western music that connect to the basic principles of perception and cognition listed above, but play out in slightly different specific ways in musical styles. They are:

- **pitch proximity** – the tendency for melodies to progress by steps more than leaps and by small leaps more than large leaps. An expression of smoothness and melodic integrity.
- **step declination** – the tendency for melodies to move by *descending* step more than ascending. Possibly an expression of goal-oriented motion, as we tend to perceive a move down as a decrease in energy (movement towards a state of rest).
- **step inertia** – the tendency for melodies to change direction less frequently than they continue in the same direction. (I.e., the majority of melodic progressions are in the same direction as the previous one.) An expression of smoothness and, at times, goal-oriented motion.
- **melodic regression** – the tendency for melodic notes in extreme registers to progress back towards the middle. An expression of motion towards a position of rest (with non-extreme notes representing "rest"). Also an expression simply of the statistical distribution of notes in a melody: the higher a note is, the more notes there are below it for a composer to choose from, and the less notes there are above it.
- **melodic arch** – the tendency for melodies to ascend in the first half of a phrase, reach a climax, and descend in the second half. An expression of goal-orientation and the rest–motion–rest pattern. Also, a combination of the above rules in the context of a musical phrase.

Practice exercise

Before composing a *cantus firmus* from scratch, try building a well formed *cantus* around the following skeleton. Length, starting pitch, penultimate pitch, ending pitch, and climax have been provided. Create a smooth, consonant melodic line that exemplifies the characteristics listed above—both the specific characteristics of strict species *cantus firmi* and the general characteristics of tonal melodies. Click the staff to hear the melody. Be sure to listen each time you make a change.



2.3: Strict Two-Voice Composition - Composing a First-Species Counterpoint

Counterpoint is the mediation of two or more musical *lines* into a meaningful and pleasing *whole*. In first-species counterpoint, we not only write a smooth melody that has its own integrity of shape, variety, and goal-directed motion, but we also write a second melody that contains these traits. Further, and most importantly, we combine these melodies to create a whole texture that is smooth, exhibits variety and goal-oriented motion, and in which these melodies both maintain their independence and fuse together into consonant *simultaneities* (the general term for two or more notes sounding at the same time).

In first species counterpoint, we begin with a *cantus firmus* (new or existing) and compose a single new line—called the *counterpoint*—above or below the cantus firmus. That new line contains one note for every note in the cantus: both the cantus firmus and the counterpoint will be all whole notes. Thus, first species is sometimes called one-against-one or 1:1 counterpoint.

The counterpoint line

In general, the counterpoint should follow the principles of writing a good cantus firmus. There are some minor differences, to be discussed below, but generally a first-species counterpoint should consist of two cantus-firmus-quality lines.

Beginning a first-species counterpoint

To exemplify goal-oriented motion, the first-species exercise should begin and end with the most stable of sonorities: perfect consonances. Thus, when writing a counterpoint *above* a cantus firmus, the first note of the counterpoint should be *do* or *sol* (a P1, P5, or P8 above the cantus).

When writing a counterpoint *below* a cantus firmus, the first note of the counterpoint must always be *do* (P1 or P8 below the cantus). (Beginning on *sol* would create a dissonant fourth; beginning on *fa* would create a P5 but confuse listeners about the tonal context, since *fa–do* at the beginning of a piece is easily misheard as *do–sol*.)

Ending a first-species counterpoint

The final note of the counterpoint must always be *do* (P1 or P8 above/below the cantus).

To approach this ending smoothly, with variety, and with strong goal orientation, always approach the final interval by contrary stepwise motion. If the cantus ends *re–do*, the counterpoint's final two pitches should be *ti–do*. If the cantus ends *ti–do*, the counterpoint's final two pitches should be *re–do*. Thus the penultimate bar will either be a minor third or a major sixth between the two lines. This is the case for both major and minor keys.

Independence of the lines

Like the cantus firmus, the counterpoint should have a single climax. To maintain the independence of the lines and the smoothness of the entire passage (so no one moment is hyper-emphasized by a double climax), these climaxes should not coincide.

A single repeat/tie in the counterpoint is allowed, but try to avoid repeating at all. This promotes variety in the exercise, since there are so few notes to begin with.

Avoid *voice crossing*, where the upper voice is temporarily lower than the lower voice, and *vice versa*. Voice crossings diminish the independence of the lines and make them more difficult to distinguish by ear.

Avoid *voice overlap*, where one voice leaps past the previous note of the other voice. For example, if the upper part sings an E4, the lower part cannot sing an F4 in the following bar. This also helps maintain the independence of the lines.

Intervals and motion

The interval between the cantus and counterpoint at any moment should not exceed a perfect twelfth (octave plus fifth). In general, try to keep the two lines within an octave where possible, and only exceed a tenth in "emergencies," and only briefly (one or two notes). When the voices are too far apart, tonal fusion is diminished. Further, it can diminish *performability*, which though not an essential principle of human cognition is an important consideration for composers, and it has a direct effect on the smoothness, melodic integrity, and tonal fusion of what listeners hear during a performance.

In general, all harmonic *consonances* are allowed. However, unisons should only be used for first and last intervals. Unisons are very stable, and serve best as goals rather than mid points. They also diminish the independence of the lines.

Imperfect consonances are preferable to *perfect consonances* for all intervals other than the first and last dyads, in order to heighten the sense of arrival at the end, and to promote a sense of motion towards that arrival. In all cases, aim for a variety of harmonic intervals over the course of the exercise.

Never, ever, ever use two perfect consonances of the same size in a row: **P5–P5** or **P8–P8**. This includes both simple and compound intervals. For example, **P5–P12** is considered the same as **P5–P5**. (Two different perfect consonances in a row, such as **P8–P5**, is allowed, however, but try to follow every perfect consonance with an imperfect consonance if possible.) These "parallel fifths and octaves" significantly promote tonal fusion over melodic independence at the same time that the consecutive stable sonorities arrest both the variety and the motion of the exercise. Thus, they are far from ideal, and to be avoided in species counterpoint.

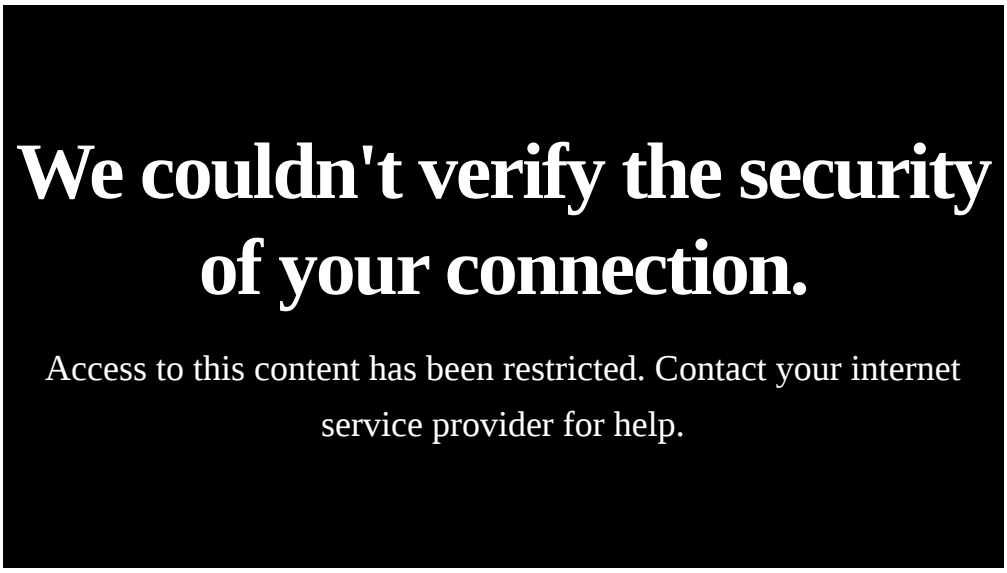
Vary the types of motion between successive intervals (parallel, similar, contrary, oblique). Try to use all types of motion (except, perhaps, oblique motion), but prefer contrary motion where possible. It is best for preserving the independence of the lines, in addition to variety.

Because similar and parallel motion diminish variety and melodic independence, their use should be mediated by other factors:

- Do not use more than three of the same imperfect consonance type in a row (e.g., three thirds in a row).
- *Never* move into a perfect consonance by similar motion (this is called *direct* or *hidden octaves*). This draws too much attention to an interval which already stands out of the texture.
- Avoid combining similar motion with leaps, especially large ones.

Demonstration

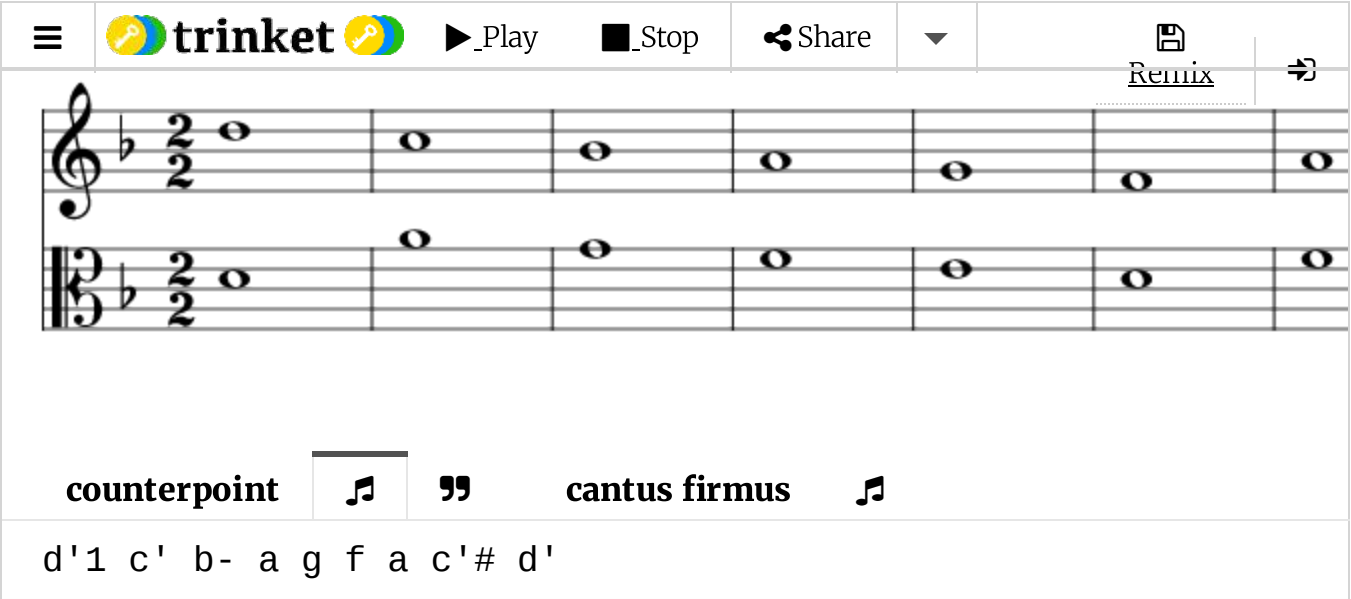
In the following video, I illustrate the process of composing a first-species counterpoint. This video provides new information about the compositional process, as well as concrete examples of the above rules and principles.



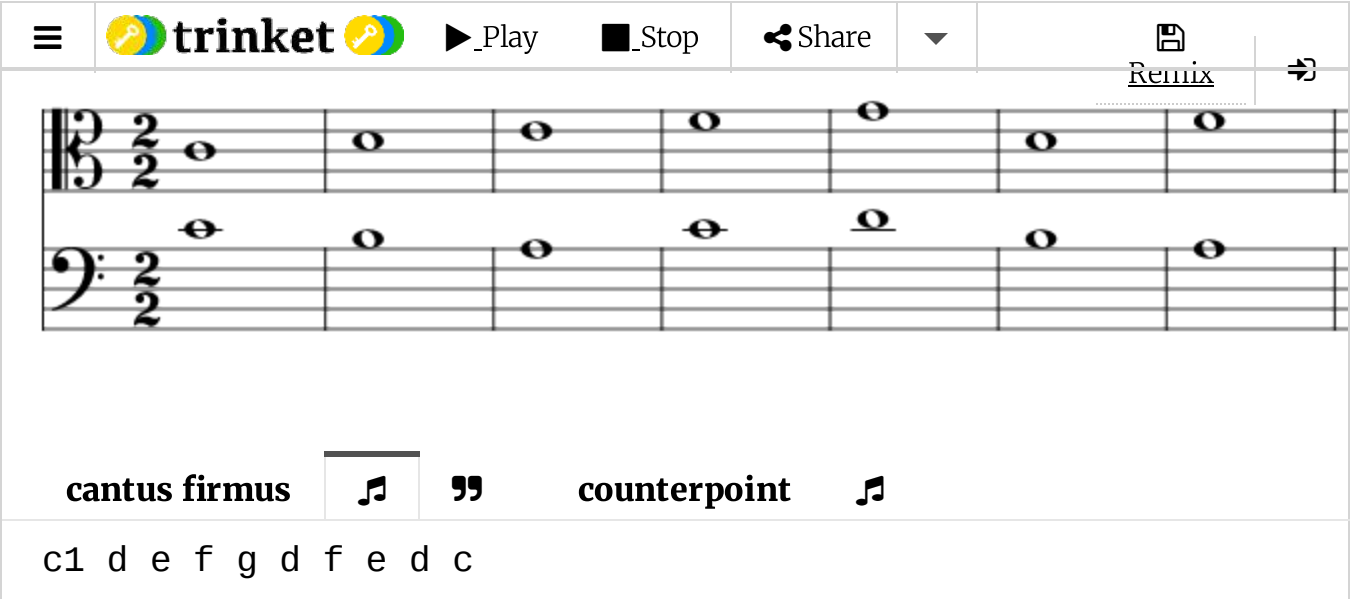
Practice

Before composing a first-species exercise from scratch, try the following practice exercises. Each has one or two errors. Try to find the error(s), and recompose the exercise to create a well formed exercise. (Note: the alto-clef part is the *cantus firmus*. Only change the counterpoint line.) Be sure to listen to and perform the exercises, both as they are written, and as you make changes. Your ear may already be able to direct you to errors. If not, use the principles outlined above one-by-one to search for errors. Once you identify an error, be sure to listen several times, singing along with one line or the other, to train your ear to recognize the problem.

Minor key practice, counterpoint above

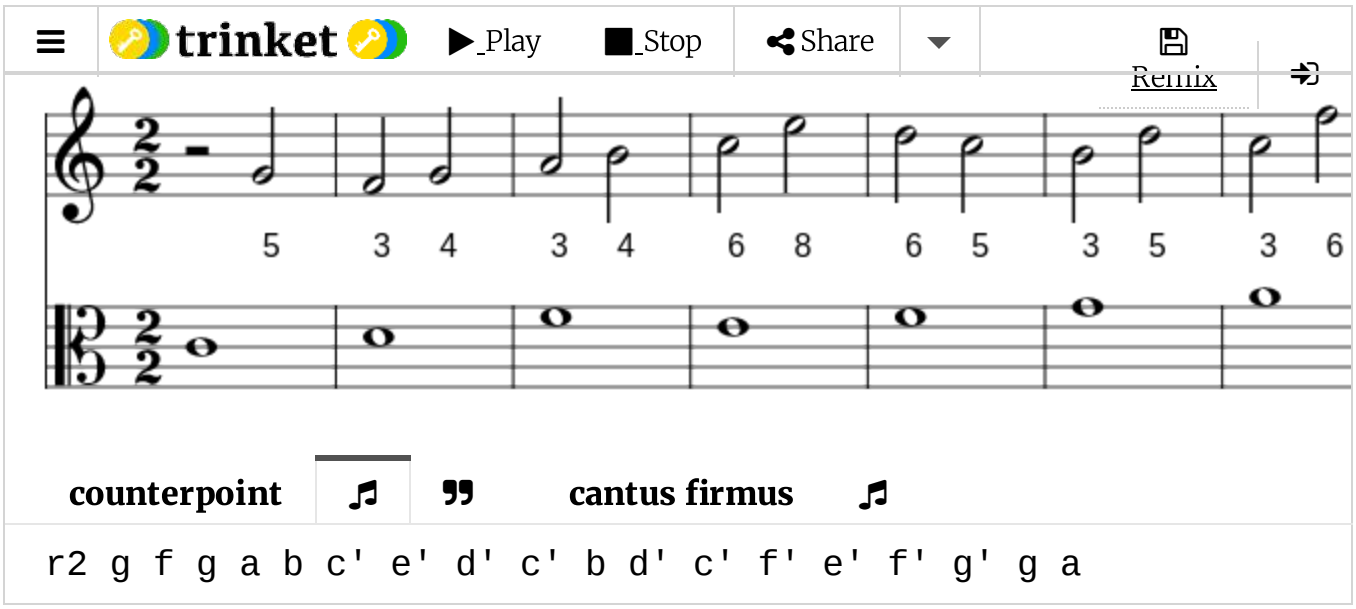


Major key practice, counterpoint below



2.4: Strict Two-Voice Composition - Composing a Second-Species Counterpoint

In second-species counterpoint, the counterpoint line moves in half notes against a cantus firmus in whole notes. This 2:1 rhythmic ratio leads to two new "fundamental musical problems"—one metric and one harmonic: the differentiation between *strong beats* and *weak beats*, and the introduction of the *passing tone* dissonance.



An example second-species exercise by Heinrich Schenker.

The introduction of harmonic dissonance into second species adds to the variety of the musical texture. However, it brings a tension that must be balanced with consonance to promote tonal fusion, and it requires careful attention in order to maintain smoothness in and out of the dissonance.

The counterpoint line

As in first species, the counterpoint line should be singable, have a good shape, with a single climax and primarily stepwise motion (with some small leaps and an occasional large leap for variety). However, because a first-species counterpoint had so few notes, in order to maintain smoothness in other aspects of the exercise, the melody frequently employed small leaps. In second species, the increase in notes and the added freedom involving the use of dissonance makes it easier to move by step without causing other musical problems. Thus, a second-species counterpoint is even *more dominated by stepwise motion* than in first species.

If the counterpoint must leap, take advantage of the metrical arrangement to diminish the attention drawn to the leap: leap from strong beat to weak beat (within the bar) rather than from weak beat to strong beat (across the barline) when possible.

Also, because there are more notes in a second species line, there should usually be one or two *secondary climaxes*—notes lower than the overall climax that serve as "local" climaxes for portions of the line. This will help the integrity of the line, by ensuring it has a coherent shape and does not simply wander around.

Beginning a second-species counterpoint

As in first species, begin a second-species counterpoint above the cantus firmus with *do* or *sol*. Begin a second-species counterpoint below the cantus firmus with *do*. Unisons are permitted for the first and last dyads of the exercise.

A second-species line can begin with two half notes in the first bar, or a half rest followed by a half note. Beginning with a half rest establishes the rhythmic profile more readily, making it easier for the listener to parse, so it is often preferable. It is also easier to compose. Regardless of rhythm, the first pitch in the counterpoint should follow the intervallic rules above.

Ending a second-species counterpoint

The final pitch of the counterpoint should be *do*, as in first species.

The penultimate note of the counterpoint should be *ti* if the cantus is *re*, and *re* if the cantus is *ti*, as in first species.

The penultimate bar of the counterpoint can either be a *whole note* (making the last two bars identical to first species), or two half notes. Which option you use will depend on how you are approaching the final bar. (This is simply a historical convention, not a musical necessity. But the added degree of freedom makes it easier to move into the final arrival smoothly without adding too many complicating factors.)

Strong beats

Because the inclusion of dissonance in a musical texture creates new musical problems that need to be addressed, second species introduces dissonance in a very limited way. This is not a musical necessity, and it's not the only way to address dissonance, but it helps by introducing a small number of new musical difficulties in each species.

Strong beats (downbeats) in second species are *always consonant*. As in first species, prefer imperfect consonances (thirds and sixths) to perfect consonances (fifths and octaves), and avoid unisons.

Because motion across bar lines (from weak beat to strong beat) involves the same kind of voice motion as first species (two voices moving simultaneously), follow the same principles as first species counterpoint. For instance, if a weak beat is a perfect fifth, the following downbeat must not also be a perfect fifth.

Likewise progressions from downbeat to downbeat must follow principles of first-species counterpoint. The following are some examples, but not an exhaustive list:

- Do not begin two consecutive bars with the same perfect interval.
- Do not outline a dissonant melodic interval between consecutive downbeats. (Exception: if the counterpoint leaps an octave from the strong beat to the weak beat, the leap should be followed by step in the opposite direction making a seventh with the preceding downbeat. This is okay, since it is the result of smooth voice motion.)
- Do not begin more than three bars in a row with the same imperfect consonance.

Hidden or *direct fifths/octaves* between successive downbeats are fine, as the effect is weak, and the intervening note in the counterpoint diminishes that effect.

Weak beats

Since harmonic dissonances can appear on weak beats, a mixture of consonant and dissonant intervals on weak beats is the best way to promote variety.

Unisons were problematic in first species because they diminished the independence of the lines. However, when they occur on the weak beats of second species and are the result of otherwise smooth voice-leading, the rhythmic difference in line is sufficient to maintain that independence. Thus, unisons are permitted on weak beats when necessary to make good counterpoint between the lines.

Any weak-beat dissonance must follow the pattern of the *dissonant passing tone*, explained below. Also explained below are a number of standard patterns for consonant weak beats. Chances are high that if your weak beats do not fit into one of the following patterns, there is a problem with the counterpoint, so use them as a guide both for composing the counterpoint, and for evaluating it.

Weak beat patterns

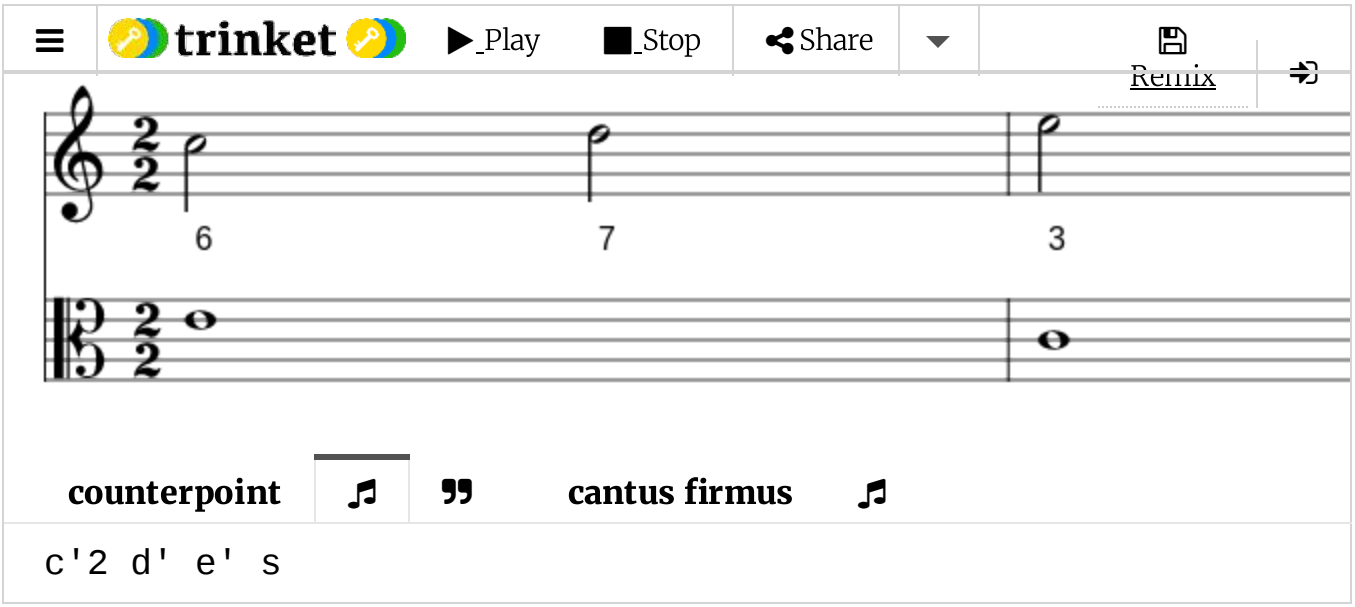
The following patterns (whose terms are either standard or taken from Salzer & Schachter's *Counterpoint in Composition*) should guide your use of weak-beat notes in a second-species counterpoint line. A good general practice is to start with a downbeat note, then choose the following downbeat note, and finally choose a pattern below that will allow you to fill in the space between downbeats well.

Most of these are used as examples in the demonstration video at the bottom of the page.

Dissonant weak beats

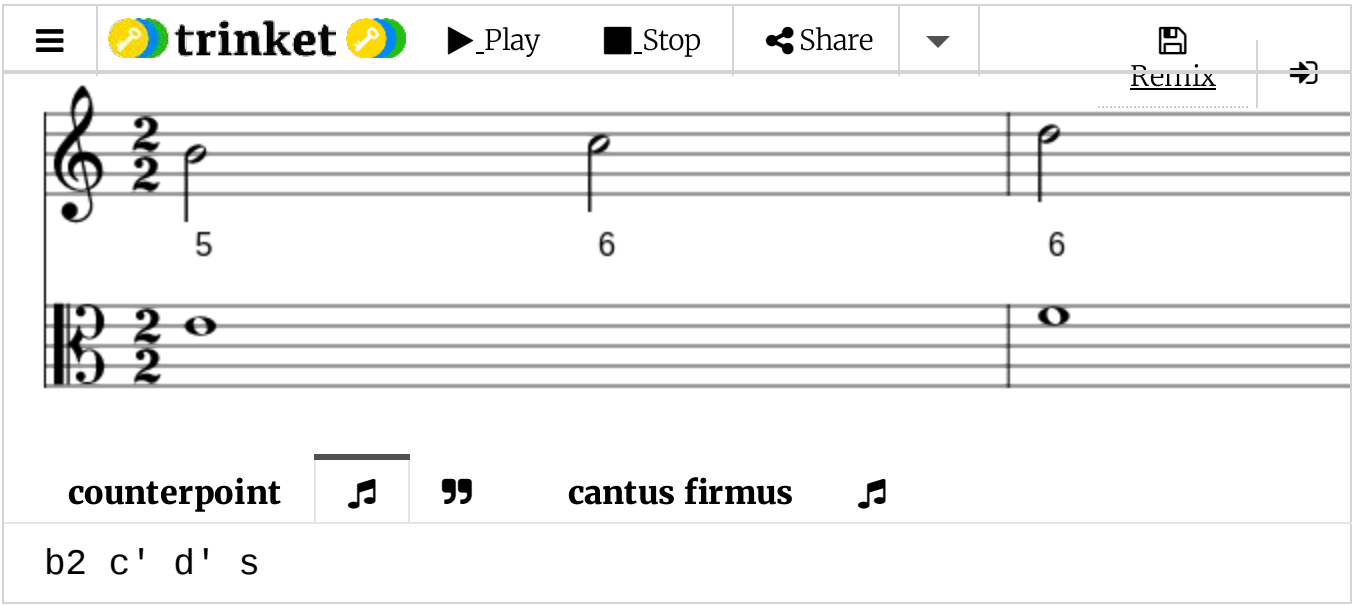
All dissonant weak beats in second species are dissonant passing tones, so called because the counterpoint line passes from one consonant downbeat to another consonant downbeat by stepwise motion. The melodic interval from downbeat to downbeat in the counterpoint will always be a third, and the passing tone will come in the middle in order to fill that third with passing motion.

Since all dissonances in second species are passing tones, you will never leap into or out of a dissonant tone, nor will you change directions on a dissonant tone, nor will any dissonances occur on a downbeat.



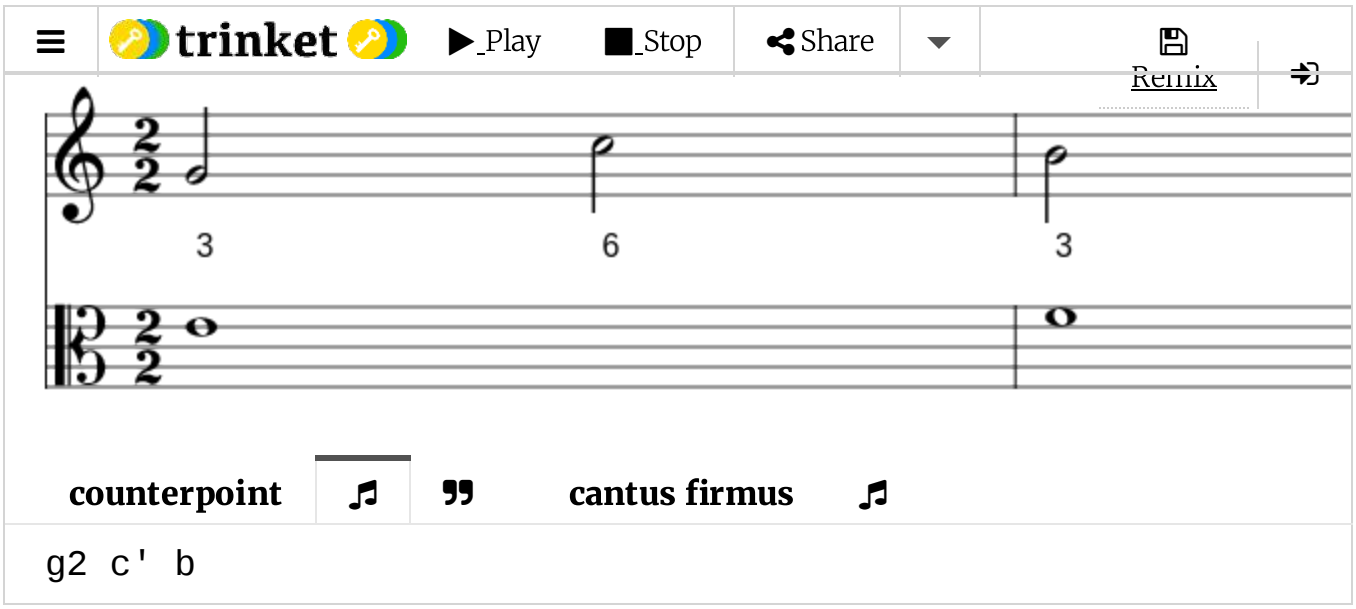
Consonant weak beats

A *consonant passing tone* outlines a third from downbeat to downbeat, and has the same pattern as the dissonant passing tone, except that all three tones (downbeat, passing tone, downbeat) are consonant with the cantus. A consonant passing tone will always be a sixth or perfect fifth above/below the cantus.

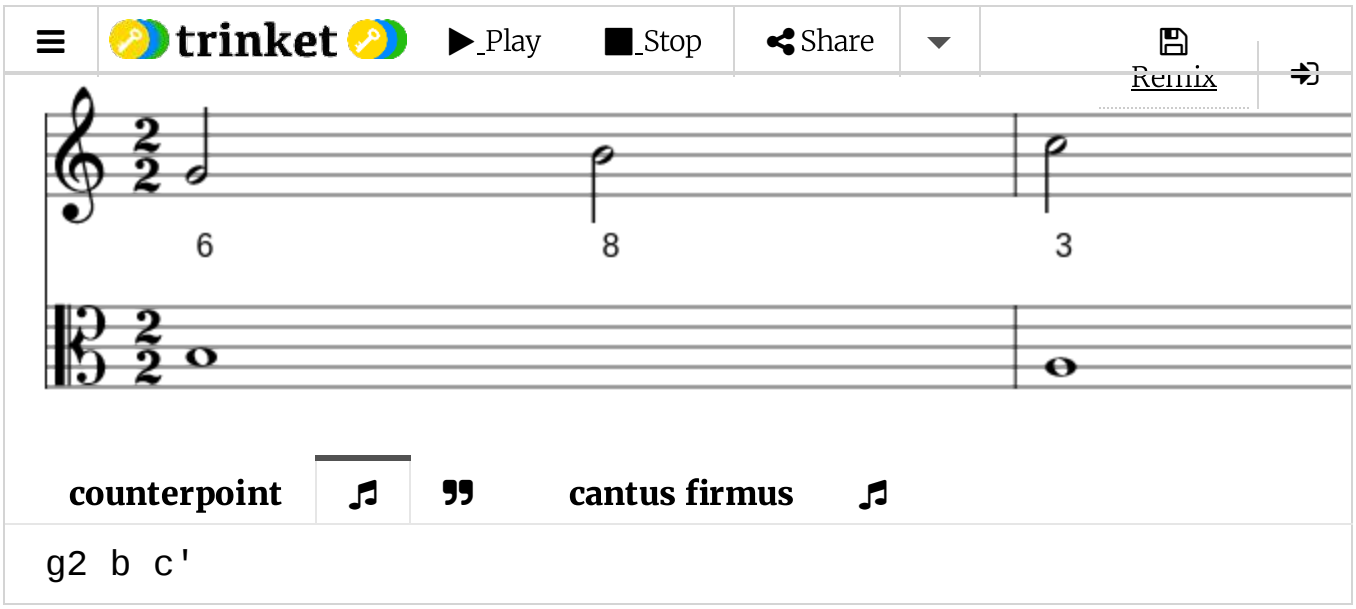


A *substitution* also outlines a third from downbeat to downbeat. However, instead of filling it in with stepwise motion, the counterpoint leaps a fourth and then steps in the opposite direction. It is called a substitution because it can substitute for a passing

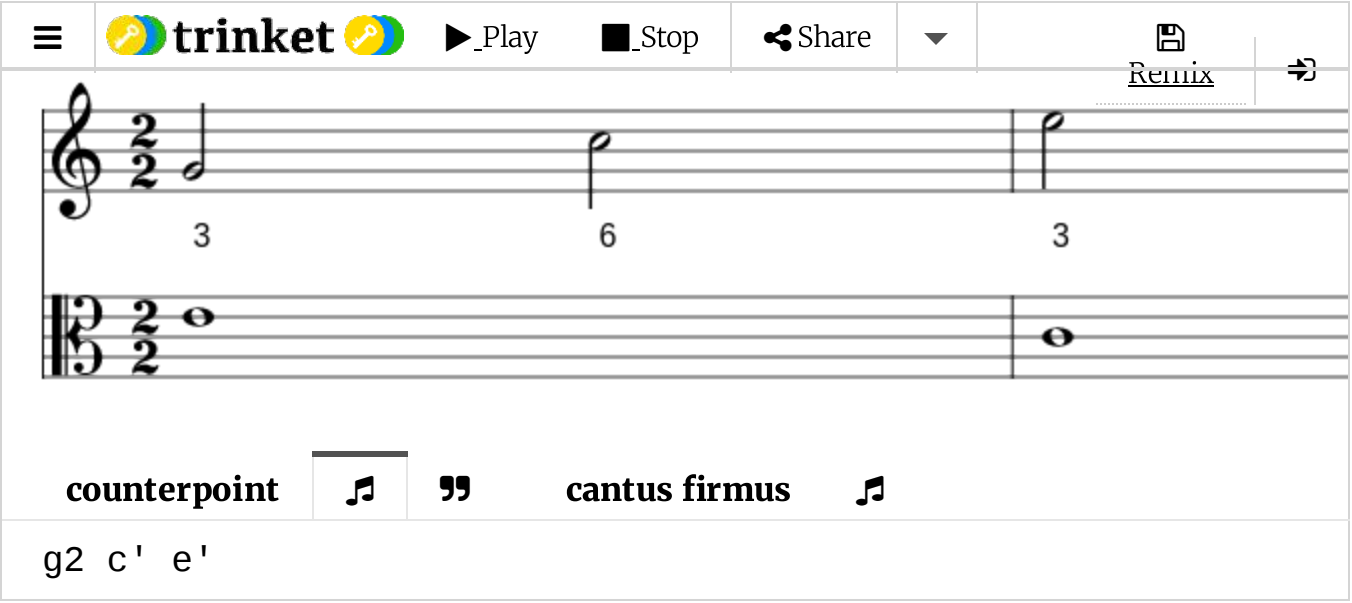
tone in a line that needs an extra leap or change of direction to provide variety. Like the consonant passing tone, all three notes in the counterpoint must be consonant with the cantus.



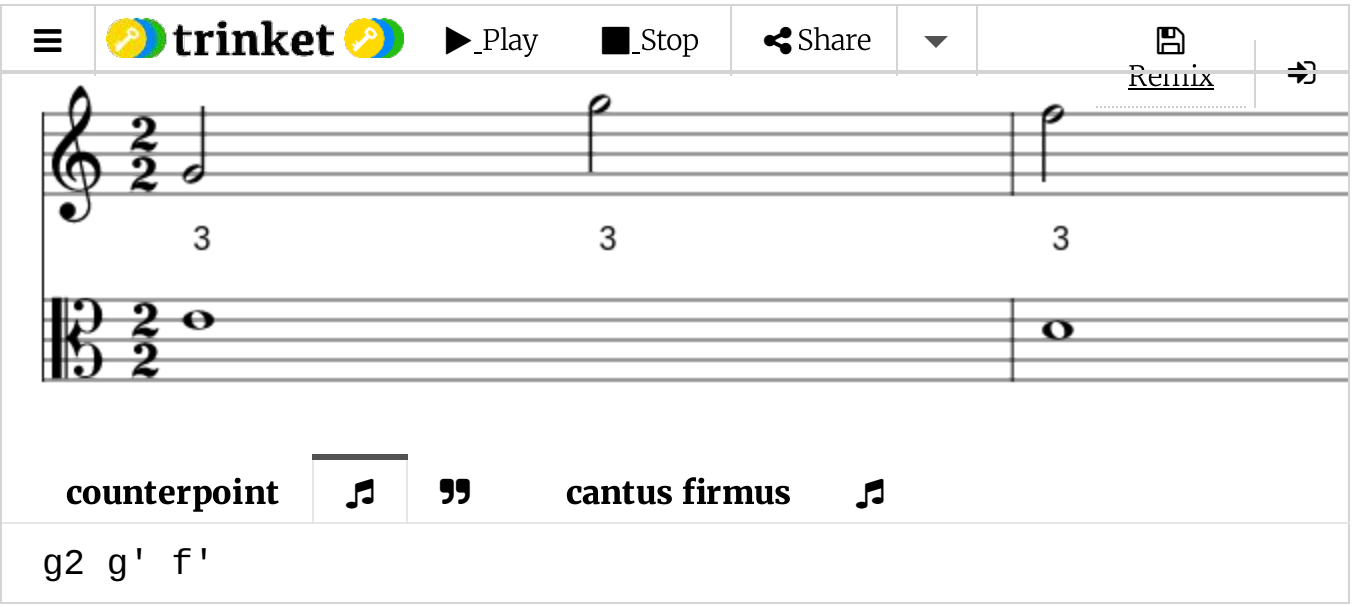
A *skipped passing tone* outlines a fourth from downbeat to downbeat. The weak-beat note divides that fourth into a third and a step. Again, all three intervals (downbeat, skipped passing tone, downbeat) are consonant with the cantus.



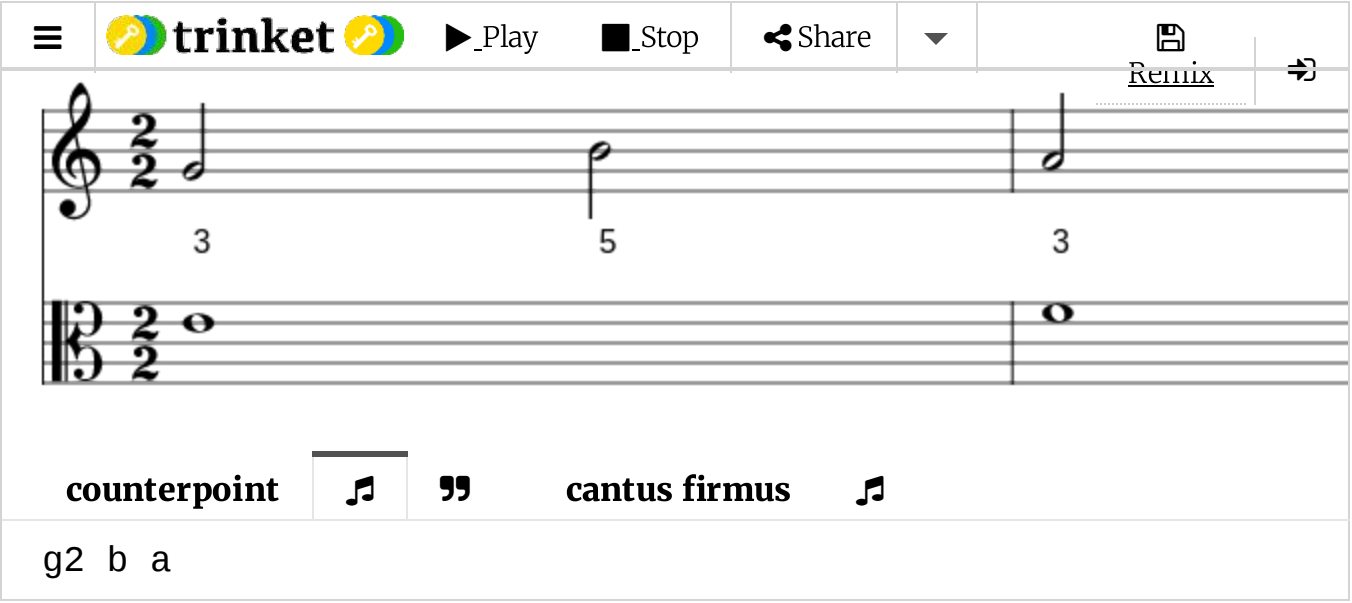
An *interval subdivision* outlines a fifth or sixth between successive downbeats. The large, consonant melodic interval between downbeats is divided into two smaller consonant leaps. A melodic fifth between downbeats would be divided into two thirds. A melodic sixth between downbeats would be divided into a third and a fourth, or a fourth and a third. Not only must all three *melodic* intervals be consonant (both note-to-note intervals and the downbeat-to-downbeat interval), but each note in the counterpoint must be consonant with the cantus.



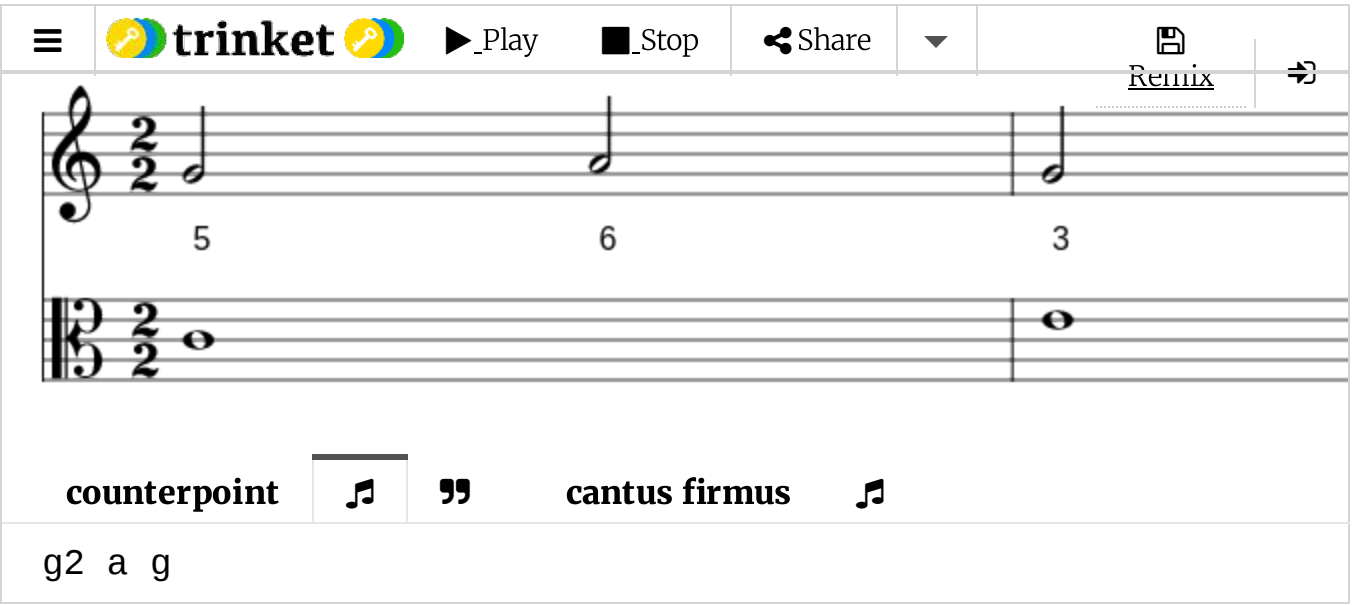
A *change of register* occurs when a large, consonant leap (P5, sixth, or octave) from strong beat to weak beat is followed by a step in the opposite direction. It is used to achieve melodic variety after a long stretch of stepwise motion, to avoid parallels or other problems, or to get out of the way of the cantus to maintain independence. It should be used infrequently. And as always, each note must be consonant with the cantus.



A *delay of melodic progression* outlines a step from downbeat to downbeat. It involves a leap of a third from strong beat to weak beat, followed by a step in the opposite direction into the following downbeat. It is called a “delay” because it is used to embellish what otherwise is a slower first-species progression (motion by step from downbeat to downbeat).



A *consonant neighbor tone* occurs when the counterpoint moves by step from downbeat to weak beat, and then returns to the original pitch on the following downbeat. If the first downbeat makes a fifth with the cantus, the consonant neighbor will make a sixth, and *vice versa*.



Demonstration

In the following video, I illustrate the process of composing a second-species counterpoint. This video provides new information about the compositional process, as well as concrete examples of the above rules and principles.

2.5: Strict Two-Voice Composition - Composing a Third-Species Counterpoint

In third-species counterpoint, the counterpoint line moves in quarter notes against a cantus firmus in whole notes. This 4:1 rhythmic ratio creates a still greater differentiation between beats than in second species: *strong beats* (downbeats), *moderately strong beats* (the third quarter note of each bar), and *weak beats* (the second and fourth quarter notes of each bar). Third species also introduces the *neighbor tone* dissonance, and two related figures in which dissonances can participate in leaps.

The counterpoint line

As in first and second species, the counterpoint line should be singable, have a good shape, with a single climax that does not coincide with the climax of the cantus firmus, and primarily stepwise motion (with some small leaps and an occasional large leap for variety). Like second species, a third-species counterpoint should be even *more dominated by stepwise motion* than in first species, because there are less sticky situations that would require a leap. If the counterpoint must leap, prefer to do so within the bar rather than across the barline. Also like second species, there should usually be one or two *secondary climaxes*—notes lower than the overall climax that serve as "local" climaxes for portions of the line.

Beginning a third-species counterpoint

Begin a third-species counterpoint above the cantus firmus with *do* or *sol*. Begin a third-species counterpoint below the cantus firmus with *do*. Unisons are permitted for the first and last dyads of the exercise.

A third-species line can begin with four quarter notes in the first bar, or a quarter rest followed by three quarter notes. Regardless of rhythm, the first pitch in the counterpoint should follow the intervallic rules above.

Ending a third-species counterpoint

The final pitch of the counterpoint must always be *do*, and must be a whole note.

The penultimate note of the counterpoint (the last quarter note of the penultimate bar) should be *ti* if the cantus is *re*, and *re* if the cantus is *ti*.

Strong beats

Principles for strong beats (downbeats) are generally the same as in second species.

Strong beats are *always consonant*, and not unisons. Prefer imperfect consonances (thirds and sixths) to perfect consonances (fifths and octaves).

Motion across bar lines (from beat 4 to downbeat) follows the same rules as first species counterpoint.

Progressions from downbeat to downbeat follow principles of second-species counterpoint, with one exception (see below). The following are some examples, but not an exhaustive list:

- No *three* consecutive bars can begin with the same perfect interval (two in a row are fine).
- No more than three bars in a row should begin with the same imperfect consonance.
- The pitches that begin consecutive downbeats must not make a dissonant melodic interval.

If a downbeat contains a perfect fifth, neither the third or the fourth beat of the previous bar can be a fifth. If a downbeat contains an octave, neither the second, third, or fourth beat of the previous bar can be an octave. Like in second species, the negative effects of parallel fifths and octaves are not mitigated by the addition of a note or two.

Hidden or *direct fifths/octaves* between successive downbeats are allowed.

Other beats

Beats 2–4 should exhibit a mixture of consonant and dissonant intervals to promote variety. Among consonances, unisons are permitted on weak beats when necessary to make good counterpoint between the lines. Any dissonance must follow the pattern of the *dissonant passing tone* or the *dissonant neighbor tone*, explained below. Also explained below are a number of standard patterns for consonant weak beats.

Harmonic dissonances

Generally, dissonances in third species can occur on beat 2, 3, or 4, and should be *preceded and followed by stepwise motion* (with the exception of the *double neighbor* and the *nota cambiata*, explained below). This promotes smoothness, both by keeping the dissonances off of the strongest beat of the bar, and by coupling them with the smoothest melodic motion. If all dissonant notes in the counterpoint follow one of the following models, they should have a pleasing effect. If not, they may sound harsh or unresolved, or will be difficult to sing.

The *dissonant passing tone* fills in the space of a melodic third via stepwise motion. The notes before and after the passing tone must be consonant with the cantus.

Note that it is possible to have two dissonant passing tones in a row (**P4–d5** or **d5–P4**). As long as these dissonances do not fall on downbeats and the counterpoint moves in stepwise motion in a single direction, there is no negative effect.

The *dissonant neighbor tone* ornaments a consonant tone by stepping away and stepping back to the original consonance (6–7–6 over the cantus, for example). It is melodically identical to the consonant neighbor tone of second species, with the difference being the harmonic dissonance. Employing it on a weak beat (2 or 4) ensures the greatest smoothness.

The *double neighbor* occurs when beats 1 and 4 in the counterpoint are the same tone, and beats 2 and 3 include the notes a step higher and a step lower than the original tone. For example, C–D–B–C or C–B–D–C. Both beats 2 and 3 are dissonant, but since both are embellishing the original tone by step, the leap between them does not significantly diminish the smoothness of the line. When using a double neighbor, the direction between beats 3 and 4 should be the same as between beat 4 and the following downbeat. That motion across the barline should also be stepwise. This further maintains smoothness to temper the effect of the dissonances.

The *nota cambiata* (changing tone) is a five-note figure that outlines a step progression from downbeat to downbeat. It follows one of two patterns:

- down by step – down by third – up by step – up by step
- up by step – up by third – down by step – down by step

The first pattern will result in a step down from downbeat to downbeat, and the second pattern will result in a step up from downbeat to downbeat. For a *nota cambiata* to be effective, the first, third, and fifth notes *must be consonant with the cantus*. The second note will be dissonant and will leap to the third tone. However, like the double neighbor, the overall pattern minimizes the negative effect of the leap away from the dissonance. It is surrounded by stepwise motion, the overall progression is a single step, and the dissonant tone and the following downbeat are the same pitch.

Consonances

The counterpoint can move in and out of consonant tones freely by step, as well as by leap from another consonance, with the following considerations:

- All melodic leaps, of course, must be melodic consonances.
- A large leap should be followed by a step in the opposite direction.
- Motion from the fourth beat into the following downbeat should follow the constraints above for motion into strong beats.

Video demonstration

Add trinkets above to have students construct the schemas

2.6: Strict Two-Voice Composition - Composing a Fourth-Species Counterpoint

In fourth-species counterpoint, the counterpoint line and cantus firmus both move once per bar, but they are rhythmically offset from each other by a half note. (Think syncopation on the bar level.) The counterpoint line will be notated in half notes, with each weak-beat half note tied across the bar line to the following strong beat. This arrangement means that in pure fourth-species counterpoint, the two lines always move in oblique motion. It also introduces a new kind of dissonance: the *suspension*.

The suspension

The *suspension* is an accented dissonance, meaning it always occurs on strong beats. Because of the increased emphasis, even greater care must be taken to promote smoothness and overall coherence. Thus, like the *passing tone* and *neighbor tone* dissonances, the suspension is always preceded and followed by harmonic consonances.

A suspension figure has three parts:

- the *preparation*: a weak-beat note in the counterpoint that is consonant with the cantus. This note will be tied into . . .
- the *suspension* itself: a strong-beat note in the counterpoint that is dissonant with the cantus. This note is the same as the preparation.
- the *resolution*: a weak-beat note in the counterpoint that is consonant with the cantus. It will always be a step lower than the suspended tone.

Use dissonant suspensions as much as possible in fourth species. Not only are they the characteristic sound of fourth species, but they sound nice, and proper use of them in fourth species will prepare you for the use of both suspensions and dissonant chord tones in later composition and arranging work.

Types of suspensions

Suspensions are categorized according to the intervals of the *suspension* and *resolution* tones above/below the cantus firmus. A **7–6 suspension**, for example, includes a strong-beat suspension that forms a seventh with the cantus, which resolves down by step to a weak-beat tone that forms a sixth with the cantus.

Possible dissonant suspensions *above* the cantus firmus are **7–6**, **4–3**, and **9–8**. (These are the only options that start on a dissonance and resolve down by step to an allowable consonance.) Possible dissonant suspensions *below* the cantus firmus are **2–3**, **5–6**, and **4–5**. (7–8 is theoretically possible, but it tends to sound less pleasing than the others. It is best avoided.)

Using suspensions

Treat suspensions in fourth species the same way you would treat their intervals of resolution in first species. For example, do not use two **9–8** or **4–5** suspensions in a row (since you cannot use two octaves or two fifths in a row in first species). Use **7–6** and **4–3** (above) or **2–3** and **5–6** (below) liberally, but no more than three times in a row (like thirds and sixths in first species).

Following the same principle, do not use the “consonant suspension” **6–5** twice in a row, since its interval of “resolution” is a fifth. In fact, because the pattern set forward by a fourth-species line invites listeners to interpret the weak beats as the main consonances, avoid any configuration that would create two fifths or two octaves on consecutive weak beats in fourth species (called “after-beat” fifths or octaves).

The fourth-species counterpoint line

Use dissonant suspensions whenever possible. This will create a line consisting mostly of downward, stepwise motion. That is fine. It will also make it hard to direct motion towards a climax. That is also fine. Do not worry about the shape of the line if it is smooth, singable, and the suspensions are properly prepared and resolved. (It is simply too difficult to create a fourth-species counterpoint with the same shape as a cantus firmus, and the pedagogical import in fourth species is the treatment of the suspensions. So we temporarily ignore melodic shape to hone our suspension skills in fourth species.)

If a dissonant suspension is not possible, try to use a tie from weak beat to strong beat. This can be a “consonant suspension,” or you can leap up from downbeat consonance to weak-beat consonance. At least one or two upward leaps will be necessary to counteract the downward resolutions in order to keep the line in a singable range.

If neither a dissonant suspension or consonant tied figure is possible, it is permissible to *break species* (see video demo below). When you break species, follow the principles of second-species counterpoint and resume fourth-species ties as soon as possible. Try not to break species more than once per exercise, and for just a bar or two.

Beginning a fourth-species counterpoint

Begin a fourth-species counterpoint above the cantus firmus with *do* or *sol*. Begin a second-species counterpoint below the cantus firmus with *do*. Unisons are permitted for the first and last dyads of the exercise.

Always begin with a half rest.

Ending a fourth-species counterpoint

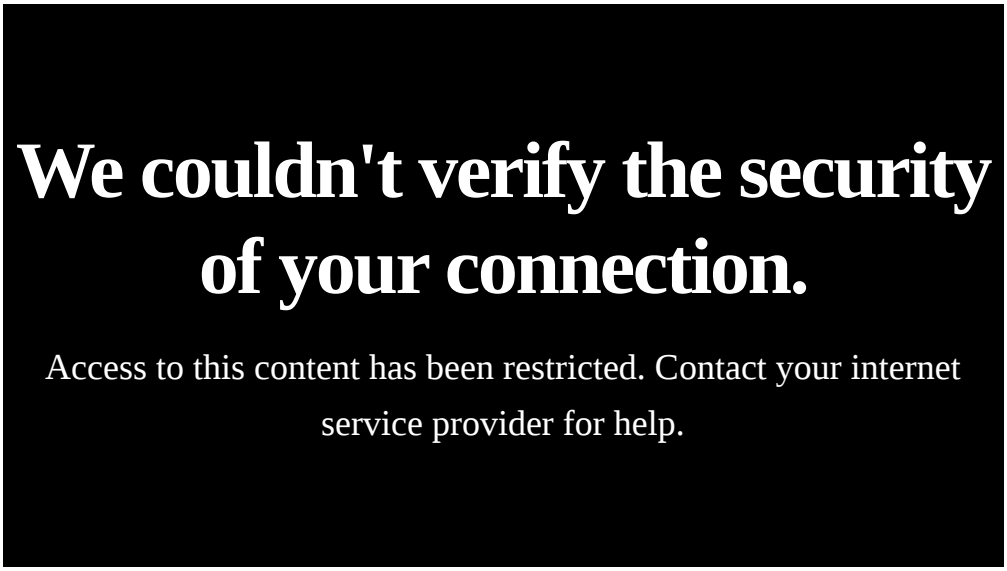
There is only one option for ending fourth species.

The cantus firmus *must* end with *re–do*. Do not use a cantus that ends with *ti–do*.

The counterpoint will end with a dissonant suspension. The penultimate bar will contain *do–ti*, and the final bar will contain a whole note *do*. The *do–ti* will form a **7–6** suspension above the *re* in the cantus, or a **2–3** suspension below the *re* in the cantus. As a dissonant suspension, that *do* will always be tied over from the previous bar.

Demonstration

In the following videos, I illustrate the process of composing a fourth-species counterpoint above and below a cantus firmus. This video provides new information about the compositional process, as well as concrete examples of the above rules and principles.

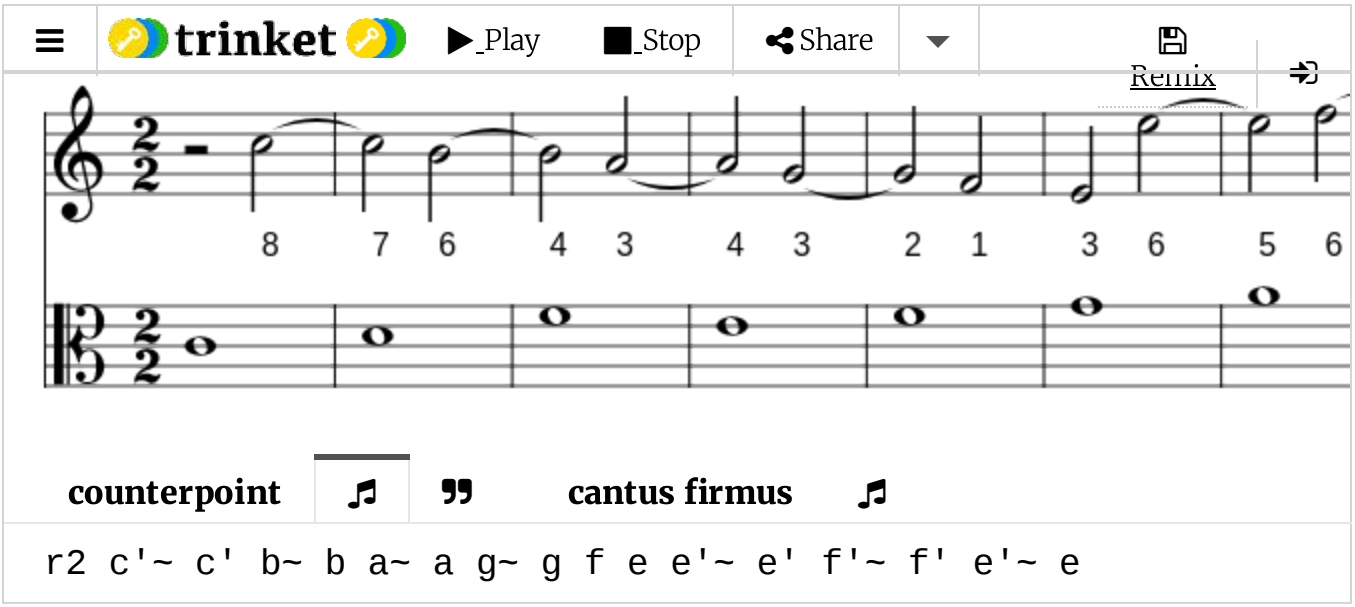


Composing a fourth-species counterpoint above a cantus firmus from Kris Shaffer on Vimeo.

Composing a fourth-species counterpoint below the cantus firmus from Kris Shaffer on Vimeo.

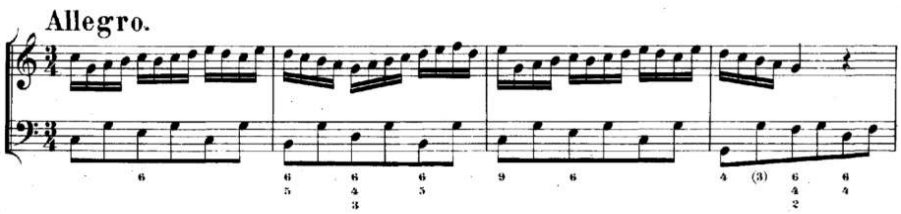
Exercise

The following is a model fourth-species composition. In it, there is a single example of a “rule” being “broken.” Find it, and attempt to recompose the exercise. Can you make a “correct” solution that is more musically satisfying than the original? If not, why do you think that is?



2.7: Strict Four-Voice Composition - Introduction to Thoroughbass

A *thoroughbass* (It. *Basso continuo*, Ger. *Generalbaß*, also called a *figured bass*) is a harmonic shorthand of a musical passage or work. It is composed of a bass line, and chord symbols—called *figures*. It is called a "thorough" bass or "continuous" bass line because it includes the lowest sounding note at any given moment, *regardless of the instrument or voice sounding the note*. It usually corresponds to a single instrument or vocal part, but not always.



J.S. Bach, Flute Sonata in C Major, ii., BWV 1033. The upper part is played by the flute, the lower part is the basso continuo *line, played by a keyboardist who uses the numbers below the staff (figures) to guide the chords played above this bass line.*

The historical origin of the thoroughbass part was in church settings where a piece for 6–8 singers was to be performed by one or two voices with a keyboard instrument. The keyboardist, rather than play the 4–7 remaining parts, would transcribe the lowest note and shorthand figures to indicate the (simple) intervals present above that lowest voice. This would allow the keyboardist to play one or two of the more important lines, and fill the rest of the texture with blocked or arpeggiated chords. (Think seventeenth-century lead sheet.) A good keyboardist, who knew their harmony and voice-leading, could simply follow the bass line without figures (an *unfigured bass*) and listen to the melody, improvising the rest. Less experienced keyboardists, however, could manage otherwise complicated pieces by reading a bass line and memorizing a small number of figures and basic voice-leading rules. (You can read a more detailed explanation of its history here.)

Coming after species counterpoint in our studies, *basso continuo* exercises provide a new, more complicated environment in which to practice mediating the demands of smoothness, independence of lines, tonal fusion (now considering triads and seventh chords), variety, and motion. New considerations of performability are introduced, and the presence of dissonances within the core harmonies themselves will call for new approaches to harmonic dissonance in this style.

We will use thoroughbass lines for a number of purposes in this book:

- harmonic "reductions" of pieces and passages with dense textures or complicated voice-leading
- shorthand representations of stock harmonic patterns
- the harmonic basis for model composition exercises (akin to the *cantus firmus* of species counterpoint)

Thoroughbass is a simple, and foundational, concept. Master it early, and subsequent activities will be much easier.

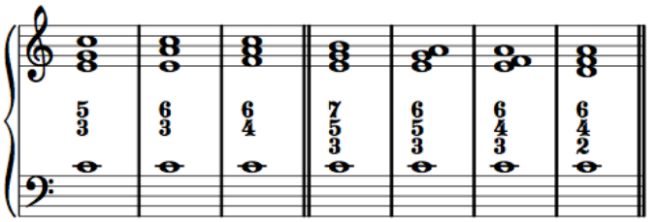
Note on figure placement: Thoroughbass figures can appear above or below the bass line. Both are common, but in this book, we generally place them *above* the bass line. This connects them to our habits of interval analysis during species counterpoint, keeps figures separate from other harmonic symbols we will place below the bass line, and make typesetting in notation software easier when both figures and other symbols are in play simultaneously.

Figures

In general, a thoroughbass figure indicates the *simple intervals above the bass* for all pitch classes present in the chord.

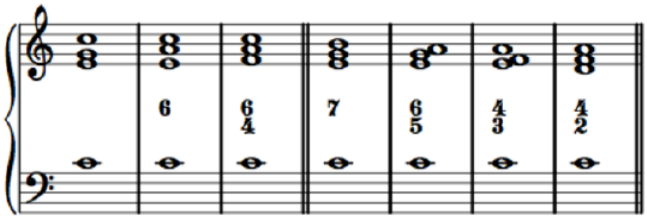
The largest number typically found in thoroughbass figures is 7. In general, *compound intervals* (an octave or larger) are reduced to their *simple interval* equivalent. A tenth becomes a third, a thirteenth becomes a sixth, etc.

The most common chords in tonal music are *triads* and *seventh chords*. The following figures apply to these chords:



- 5/3: use a fifth and a third above the bass (one note of the chord will be doubled)
- 6/3: use a sixth and a third above the bass (one note of the chord will be doubled)
- 6/4: use a sixth and a fourth above the bass (one note of the chord will be doubled)
- 7/5/3: use a seventh, a fifth, and a third above the bass
- 6/5/3: use a sixth, a fifth, and a third above the bass
- 6/4/3: use a sixth, a fourth, and a third above the bass
- 6/4/2: a use a sixth, a fourth, and a second above the bass

These figures are so common, that most of them have shortcuts:



- no figure = 5/3
- 6 = 6/3
- 6/4 is never abbreviated
- 7 = 7/5/3
- 6/5 = 6/5/3
- 4/3 = 6/4/3
- 4/2 (or just 2) = 6/4/2

Other shortcuts generally follow two simple rules:

- Assume a fifth is present above the bass unless there is a “6” in the figure.
- Assume a third is present above the bass unless there is a “4” or a “2” in the figure.

Unfamiliar figures and chords

Only seven figures are given above. If you see a figure you do not recognize, simply follow the intervals (using the two shortcut rules). Likewise, if analyzing a chord that is not a triad or seventh chord, simply label the *simple* intervals you see/hear above the bass, from top to bottom in descending order: 7/6/3 or 5/4, for example. In time, you will become familiar with a number of other harmonic possibilities, and their corresponding figures.

Chords of the fifth and chords of the sixth

All chords can be categorized as either a *chord of the fifth* or a *chord of the sixth*. This distinction will be important for our study of voice-leading.

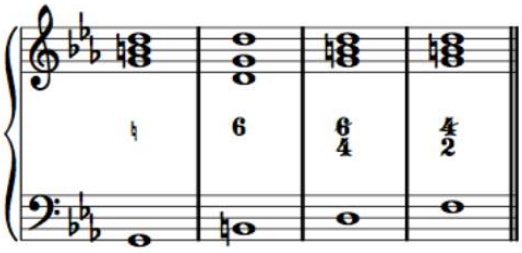
A *chord of the fifth* contains a fifth above the bass, but no sixth above the bass.

A *chord of the sixth* contains a sixth above the bass.

Chromatic alteration

If a note is chromatically altered (different than the key signature), the figure must be altered as well. Since bass notes are already present in the bass, a chromatic alteration in the bass will not make it into the figure. However, any other alteration in the upper voices (such as a raised leading tone in minor) must be reflected in the figure. To do so, simply put a sharp, flat, or natural to the left of the appropriate number.

Of course, there are some shortcuts. For example, draw a line (a “slash”) through a number to denote that it is raised by half-step (can substitute both for sharp or for natural). Also, when altering the third above the bass, simply use the sharp, flat, or natural and leave out the “3.”



In general, if there is a shortcut available, use it. The shortcuts are more standard than the corresponding full notation.

Keep in mind that some chords have abbreviated figures. For example, it is common for the leading tone to be the third above the bass in a 5/3 chord. In such a situation, a bass note that otherwise would have no figure needs a sharp or a natural for its thoroughbass figure.

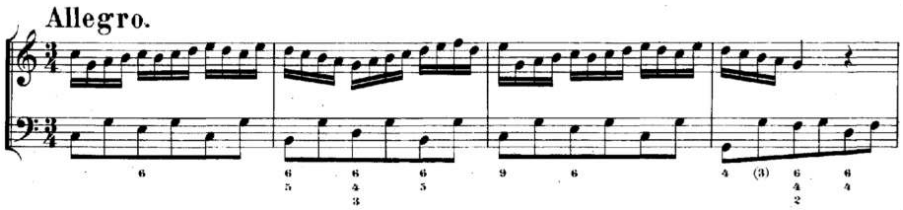
2.8: Strict Four-Voice Composition - A Brief History of basso continuo Keyboard-Style Voice-Leading

Basso continuo emerged in the seventeenth century as a shorthand notation for keyboardists (typically church organists) who were accompanying a soloist or small ensemble performing a work originally composed for a larger group. For example, if two or three singers were tasked with performing an eight-voice choral work, they could select the most prominent parts to sing, while an organist could cover the rest. Performing five or six lines of contrapuntal choral music could be a significant challenge, so organists needed a way to condense the texture while still preserving the core musical structure to support the vocalists.

The *thorough bass* emerged as that shortcut. The "thorough" or "continuous" bass is a musical line that includes the lowest note at any given time. Usually, works would not include a single part that could function as this line, so the organist would alternate between voices, as they exchanged registers or took rests. The resulting line, unline the regular "bass" part, was "continuous" (or "thorough")—hence the name *thoroughbass* or *basso continuo*.

A good musician could perform this bass line, and with an eye (or ear) on the vocal parts and with knowledge of how to improvise good voice-leading, that musician could *accompany* the thoroughbass line with chords that made musical sense. (This is the original meaning of the term accompany—to accompany a bass line with chords. The fact that keyboardists did this in the context of supporting a soloist or small ensemble led to that term later being applied to any situation where a keyboardist *accompanied* spotlight performers.)

As this technique grew, publishers began publishing thoroughbass reductions of large-ensemble pieces to support smaller groups of musicians. In these publications, *figures* (numbers above or below the bass line) were included—sometimes only for difficult or non-standard chords, and eventually for most chords, enabling more amateur musicians, as well as students, to make use of the technique. These bass lines with figures became known as "figured bass" lines.



J.S. Bach, Flute Sonata in C Major, ii., BWV 1033. The upper part is played by the flute, the lower part is the basso continuo *line, played by a keyboardist who uses the numbers below the staff (figures) to guide the chords played above this bass line.*

To this day, harpsichordists performing in Baroque ensembles will often put their left hand to the same "bass" line that the cellos play, and will improvise right-hand chords (with contrapuntally sound embellishment) according to the figures provided with the bass line.

Though most music students are not Baroque keyboard specialists in training, thoroughbass, or *basso continuo*, can be a valuable tool in the study of harmony and voice-leading. In the study of harmony, a thoroughbass line can play a valuable role as a harmonic *reduction* of a complex texture, in order to example and understand better the harmonic skeleton underlying a passage. In aural dictation, transcription, and analysis, the bass line and the melody are often the most prominent (and most important) lines in a passage, and knowing how the inner voices tend to relate to the bass line and melody can aid in a number of listening and aural-analysis tasks. In voice-leading, the *basso continuo* texture affords a straightforward environment in which to make a gradual, staged progression through the intricacies of writing musical lines in a harmonic texture—and to do so without paying significant attention to harmony.

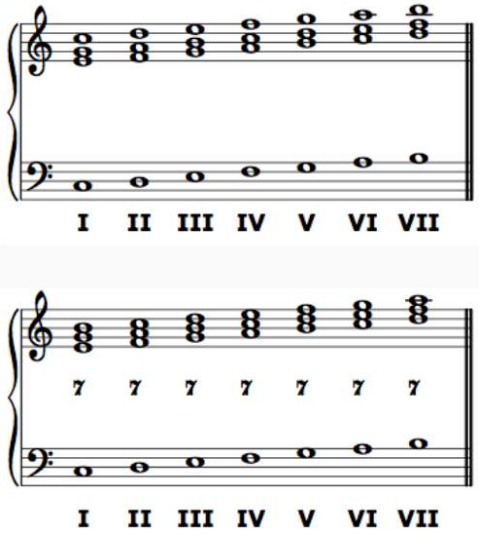
2.9: Strict Four-Voice Composition - Generating Roman Numerals from a Figured Bass Line

Both bass lines and root progressions are important for the study and mastery of tonal harmony. Most of our work will focus on the bass lines, and what follows will help you analyze the root progressions present in any figured bass line. In other words, this will help you perform a Roman numeral analysis of a figured bass line.

Note that on the charts below, generic capital Roman numerals are provided.

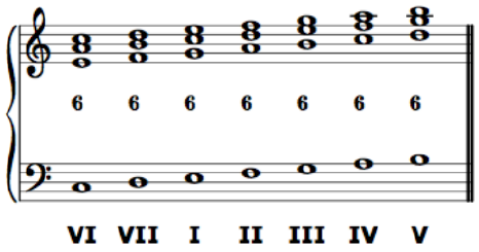
Chords of the fifth

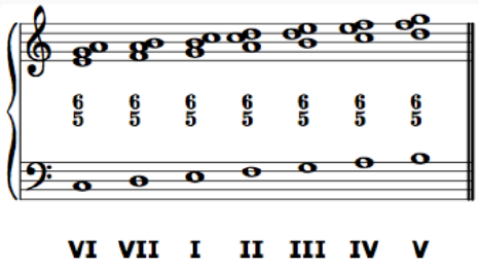
In any chord of the fifth ("root position": 5/3 or 7/5/3 chord), the bass note and the root of the chord are the same. The Roman numeral to be assigned to any chord of the fifth, then, is the scale degree of its bass note. If *do* is in the bass, the bass is scale-degree 1, and the Roman numeral is **I**. If *re* is in the bass, the Roman numeral is **II**. And so on.



"First-inversion" chords of the sixth

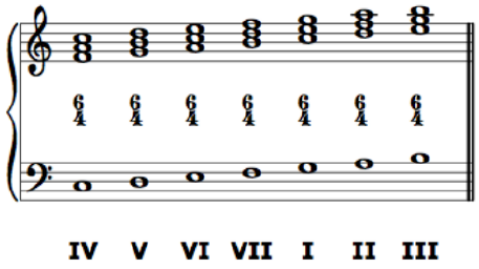
Chords of the sixth that take the figures 6/3 or 6/5/3 are *first-inversion* chords. They are so named because the third of the chord (the next chord member above the root) is in the lowest voice. However, thinking about inversions while performing an analysis can be cumbersome. It is often simpler to remember that if the figure is 6/3 or 6/5/3 (or an abbreviation such as 6 or 6/5), *the root of the chord is the sixth above the bass*. If *mi* is in the bass, and the figure is "6", the root is *do*, and the Roman numeral is **I**. If *fa* is in the bass and the figure is "6/5", the root is *re*, and the Roman numeral is **II**. And so on.

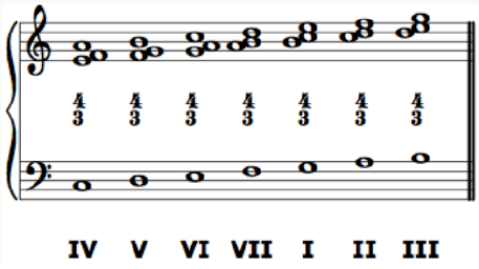




“Second-inversion” chords of the sixth

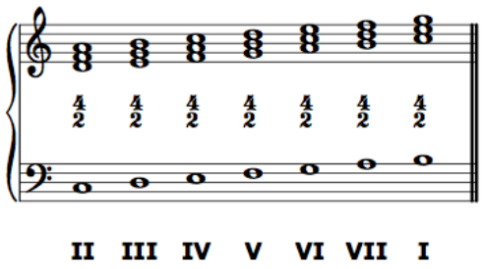
Chords of the sixth that take the figures 6/4 or 6/4/3 (or an abbreviation such as 4/3) are *second-inversion* chords. They are so named because the fifth of the chord (the second member of the chord above the root) is in the lowest voice. Again, it is often simpler to remember that for 6/4, 6/4/3, and 4/3 chords, *the root is the fourth above the bass*. If *re* is in the bass, and the figure is 4/3, the root is *sol*, and the Roman numeral is **V**.





“Third-inversion” chords of the sixth

Chords of the sixth that take the figure 6/4/2 (or its abbreviation 4/2 or simply 2) are *third-inversion* chords. Their root is a second, or a step, above the bass. The most common 4/2 chord has *fa* in the bass, and *sol* is its root, making its Roman numeral **V**.



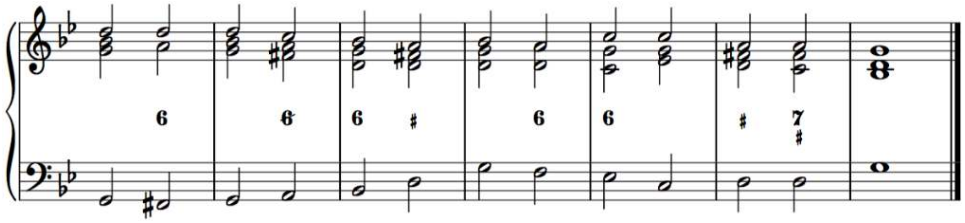
2.10: Strict Four-Voice Composition - Composing in basso continuo Style

Basso continuo (It. for “continuous bass” or “thoroughbass”) is essentially a chordal version of first-species counterpoint. However, instead of composing a single line above a cantus firmus, one composes a succession of chords (performed in the right hand) above a bass line (performed in the left hand). *Basso continuo* writing, also referred to as *realizing a figured bass*, gives no consideration to melody, only to the use of proper chords and the smoothest voice-leading possible. Thus, *basso continuo* style is a simple place to begin engaging the “fundamental musical problems” that arise when more than two lines are combined.

Chord voicing

In strict keyboard-style writing, there are four voices: the bass line (which is usually a given in *basso continuo* style), and three *upper voices*: the *melody* or *soprano*, the *alto*, and the *tenor* (from highest to lowest). Since all three upper voices must be played by a single hand, they should never span more than an octave.

The melody always has an upward-pointing stem. Alto and tenor share a downward-pointing stem. If the alto and tenor share a note, that note receives a single downward-pointing stem. (See m. 1 of the example below.) If melody and alto share a note, that notehead is double-stemmed. (See m. 4 of the example below.)



When choosing the notes to place in the upper voices above a figured bass, use the bass and figures to determine the pitch classes present in the chord. (When realizing an *unfigured bass*, you must determine appropriate figures before realizing.) If the chord is a four-note chord, use each chord member once, including the bass (exceptions will be noted later). If a chord has three pitch-classes (a triad, for instance), use each pitch-class once, and “double” one of them according to the following principles:

- If the figure is 6/4, 5/3, or other chord of the fifth, double the bass pitch class.
- If the figure is 6/3 and the bass is a *fixed scale degree* (*do*, *re*, *fa*, or *sol*), double the bass pitch class.
- If the figure is 6/3 and the bass is a *variable scale degree* (*mi*/*me*, *la*/*le*, or *ti*/*te*) or a chromatically altered pitch, double one of the upper voices at the octave or unison.
- Generally, do not double a variable scale degree or a chromatically altered pitch.

In *basso continuo* style, if the chord is properly voiced (correct pitch classes and correct doublings), two key principles of voice-leading will ensure good counterpoint between the voices most of the time:

- *The law of the shortest way* (a term coined by composer Arnold Schoenberg): move each voice as little as possible. Prefer repetition to steps, steps to leaps, and one leap at a time to several voices leaping at the same time.
- *Move the right hand in contrary or oblique motion to the bass.* When the bass leaps by fourth or fifth, though, this rule can be ignored.

In some cases, these rules cannot be followed absolutely (such as when a functional dissonance must be resolved, or when a melody makes it impossible—two cases to be considered later). In all cases, observe the following:

- No parallel fifths or octaves between any pair of voices.
- No contrary fifths or octaves between outer voices.
- Do not approach an octave between the outer voices by similar motion unless the melody moves by step. (All other direct/hidden fifths and octaves are permissible.)

2.11: Strict Four-Voice Composition - Style and Tendency

In explaining musical styles, Leonard Meyer divides musical characteristics into three categories: *laws*, *rules*, and *strategies*. Laws are characteristics of music that are based on human biology and psychology, and as a result laws are more-or-less universal. Rules are culturally conditioned. They are hallmarks of a particular style that are more-or-less universal within the style, but differ from style to style and culture to culture. Finally, strategies are specific ways in which composers work within a style — the things that make one composer's work sound different from another's, even if they compose in the same style.

For the most part, principles of voice-leading or harmonic progression are "rules" according to Meyer's definitions. They are specific to a style. Or, in some cases, they are shared among a few styles of Western music, but are far from universal. Thus, it can be helpful to think of them as collective traits of some music(s) we seek to understand and emulate, rather than hard-and-fast *it-must-be-done-this-way* strictures for all musical practice.

However, these rules are also related to laws, in as much as they represent one set of practices that mediate the various demands on music from basic principles of human auditory perception and cognition. For instance, the prohibition against parallel fifths is a specific way in which Western tonal composers have mediated the conflict between tonal fusion, goal-directed motion, and independence of line. There are many other similar cases.

Note, however, that while "avoid parallel fifths" takes on the form of what we consider "rules" in day-to-day speech, Meyer's rules of musical style are different. Meyer's rules are *descriptive*: these things tend to happen universally, frequently, rarely, never, in specific situations. "Avoid parallel fifths" is a *prescriptive* instruction based on that descriptive observation: because parallel fifths occur rarely in this style, and only in specific cases, avoid them in your own strict-style compositions until we have a chance to engage those specific cases — all the while remembering that other styles may have different tendencies.

That word *tendencies* is an important one. There are rarely absolutes in the musical parameters we engage most as performers, analysts, composers, listeners, etc. The absolutes of common styles fell into our unconscious background long ago. Instead, what makes each piece, composer, or style special and unique — what we care about — are the little ways in which they bend the "rules," the ways in which they express, thwart, and play with the tendencies of the style they engage — the ways they play with our expectations as listeners.

Over time, as we familiarize ourselves with a musical style, the tendencies of the style become *expectations* in our mind, and composers can, in turn, compose with those listener expectations in mind. Though those tendencies are subjective, and to a large extent statistical, the shared stylistic knowledge and the shared psychological expectancy create a kind of quasi-objective language. That musical "language," like spoken/written languages, is both reliable and bendable/breakable. The meaningfulness of a piece of music is dependent on that reliability. But its specialness is dependent on the ability for the "rules" of that language to be bent, even broken.

With this in mind, as we progress in our study of voice-leading, we will encounter more exceptions to the prescriptive rules, even in strict-style composition, and our hard-and-fast strictures will transition more and more into the language of tendency.

2.12: Strict Four-Voice Composition - Tendency Tones and Functional Harmonic Dissonances

In strict keyboard style, there are two main types of pitch tendency to keep in mind: *tendency tones* and *functional dissonances*.

Tendency tones

A *tendency tone* is a pitch (class)—usually represented as a scale degree—that tends to progress to some pitch classes more than others. Sometimes this tendency is absolute within a style, but more often it is context-dependent.

The most prominent tendency tones in Western tonal styles are *ti* (not *te*) and *le* (not *la*).

Generally speaking, when *ti* appears it tends to be followed by *do* in the same voice. In a harmonic context, this tendency is strongest when *ti* occurs in a dominant-functioning chord, and the "resolution" of that tendency comes upon change of function (to tonic or subdominant).

Likewise, when *le* appears, it tends to be followed by *sol* in the same voice. This tendency is less dependent on function.

Exceptions to these tendencies include:

- When *ti* is in the middle of a stepwise descent (*re–do–ti–la–sol*, for example), it can progress down by step. (Note that *step inertia* here diminishes the effect of an "unresolved" tendency tone. Because there are two conflicting tendencies in play, in this case, either can be "resolved" unproblematically.)
- When *ti* is in an inner voice, it can progress down to *sol* if necessary to accomplish good voice-leading in the other voices and ensure complete chords. This is called a *frustrated leading-tone*.
- When *ti* is a functional dissonance of a tonic-functioning chord (see below) it should progress down by step.

Functional dissonances

Some tendencies, such as the tendency for *le* to progress down, are relatively context-independent. Others are heavily contextualized. The primary contextual tendency for how melodic notes progress is the concept of *functional dissonance*.

Keep in mind from the Harmonic functions resource that chords tend to cluster in one of three functional groups (**T**, **S**, or **D**) When pitches fuse into a chord expressing one of these three functions, the pitches that comprise that have certain tendencies of progression that they may or may not have in other contexts.

Following are the scale degrees which act as dissonances for their respective functions:

FUNCTION	DISSONANCES
T or Tx	7, 5 when 6 is also present
S	3, 1 when 2 is also present
D	4, 6

In purely diatonic music (triads and seventh chords, no chromatics), these will include *the seventh of every seventh chord*, *the fifth of vii^o or VII* (*fa*), and *the fifth of III or iii* (*ti/te*).

Keep in mind that only sometimes do these functional dissonances express themselves in chords or intervals that are acoustically dissonant. However, they do introduce a degree of tension that, like an acoustically disonant interval in species counterpoint, requires a smooth introduction and a specific resolution.

When one of these scale degrees is present in a chord with the corresponding function, the dissonant scale degree has a strong tendency to *resolve down by step over the next change in function*. In strict composition, we will *always* follow these tendencies.

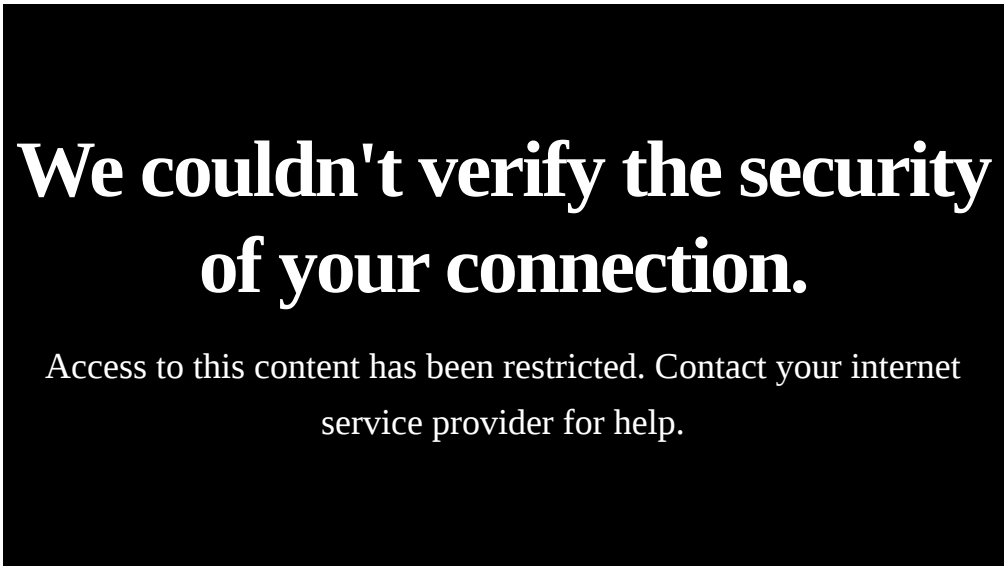
In strict keyboard style, these functional dissonances should be "prepared" (approached) by common tone or by step. Thus, though they are proper members of the chord, melodically they will look like one of the three dissonance types of species counterpoint: a *passing tone* or *neighbor tone* dissonance that is approached by step, or a *suspension* dissonance that is approached by a common tone. The suspension type is preferred.

Once a functional dissonance is introduced, it must be resolved down by step in the same voice when the function changes. The dissonance can also be *transferred* to another voice before resolution—for instance, if there are multiple chords in a row exhibiting the same function, a dissonance that appears in the alto can be transferred to the tenor in the following chord, and then resolve in the tenor when the function changes. (It is more typical, and smoother sounding, to transfer dissonances between inner voices or from an inner voice to an outer voice than from an outer voice to an inner voice. Once a dissonance appears in the melody or bass, where it is more noticeable, it tends to resolve in that voice.)

Functional dissonance resolutions often cause conflicts with other principles of voice leading. Except in special cases such as *schemata* (standard patterns that are common enough to sound appropriate, even if they follow different rules), the functional dissonance resolution takes precedence over other principles such as the *law of the shortest way*, contrary motion with the bass, and preferring common tones and steps to melodic leaps. A dissonance resolution is never an excuse for illegal parallels, and only rarely will lead to non-standard doublings.

2.13: Strict Four-Voice Composition - Realizing a Figured Bass in Strict basso continuo Style

The following video demonstrates the realization of a figured bass line in strict *basso continuo* style.



Realizing a thoroughbass in strict basso continuo style on Vimeo.

2.14: Strict Four-Voice Composition - Melodic Keyboard-Style Voice-Leading

Strict melodic keyboard-style voice-leading involves the composition of two primary musical lines—the melody and the bass line. The inner voices are secondary and serve largely as harmonic "filler." *All principles of good basso continuo voice-leading hold* for melodic keyboard-style writing. However, because of the inclusion of a melody, several additional principles of composition must be observed.

The *outer voices* (melody and bass) draw the most attention, and therefore they should make good counterpoint with each other. The melody should largely follow the principles of composing a cantus firmus or a first-species counterpoint line. In a strict keyboard-style melody that means:

- The melody should begin on a member of the tonic triad.
- The melody should end on *do*.
- The melody should have a single climax and good, smooth shape.
- The melody should be "singable" (even though it will be played on the keyboard).

These melodic constraints may make following the *law of the shortest way* and contrary/oblique motion with the bass difficult, and at times impossible. When that happens, keep the voice motion as smooth (and playable) as possible, and be very careful not to compose voice-leading errors such as forbidden parallels.

In general, if you follow the figures, double the correct chord tone, move the upper voices as little as possible and in contrary or oblique motion to the bass, and take special care when the melody makes the latter impossible, your voice leading will sound smooth and will be fairly easy to perform. Those are the goals of strict keyboard-style voice-leading.

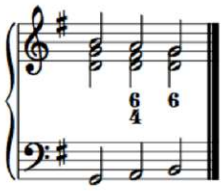
A number of specific situations come up frequently enough that they are worth tucking away as "stock patterns" to be pulled out when appropriate. See the Keyboard-style voice-leading schemata resource.

2.15: Strict Four-Voice Composition - Keyboard-Style Voice-Leading Schemata

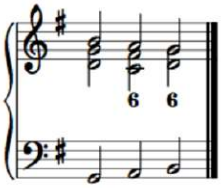
Following are a number of *schemata* for keyboard-style voice-leading. Some of these are patterns that are common enough to warrant special attention (and memorization). Others require non-default voice-leading or doublings. In any case, these are worth memorizing to assist both in composition/arranging and in recognition of standard patterns. (Some will also come in handy for chorale-style voice-leading.)

Voice exchange

A *voice exchange* occurs when the melody and bass lines exchange pitches over the course of a simple contrapuntal prolongation. For example, in the progression **T1 D2 T3**, the bass begins on *do* and ends on *mi*. In a voice exchange, the melody would reverse this, starting on *mi* and ending on *do*. This common pattern can use a $\mathbf{V^{6/4}}$, $\mathbf{V^{4/3}}$, or a $\mathbf{VII^{6/3}}$ chord for **D2**:



T(1 D2p 3)

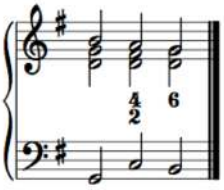


T(1 D2p 3)

Using this voice exchange pattern will ensure smooth voice-leading throughout the prolongation.

Note that the *fa* in the **D2** passing chord (a functional dissonance) of the second example does *not* resolve down to *mi*. This is permissible because *mi* is required of the bass line but cannot be doubled, and because the smooth outer-voice counterpoint and stepwise inner-voice motion counteract any harshness perceived by the unresolved dissonance.

The voice exchange can also be used with a **D4** substitution chord. Note that the upper voices will be exactly the same as using a $\mathbf{V^{6/4}}$ for **D2**.

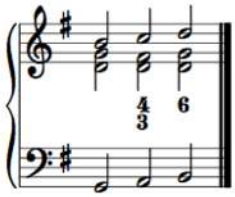


T(1 D4i 3)

These patterns can be used in major or minor, transposed to any key, and the **D2** voice exchanges can be used in reverse, as well—**T3 D2 T1**. They can also be used to prolong S and D: **S4 T5 S6** or **D5 S6 D7**, for example.

Parallel tenths

Do–re–mi in the bass is also frequently accompanied by *mi–fa–sol* in the melody, making *parallel tenths*.



T(1 D2p 3)

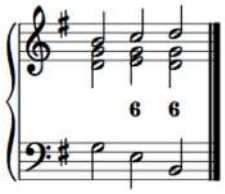
Note here that, like the *fa* in the **D2** voice exchange, the *fa* in the melody is an unresolved functional dissonance. In this case, the voice leading once again is so smooth that it overrides the need for the functional dissonance to resolve.

This pattern can also be used in major or minor, transposed to any key, and in reverse. It almost always uses a $\mathbf{V^{4/3}}$ for **D2**.

Champagne progression

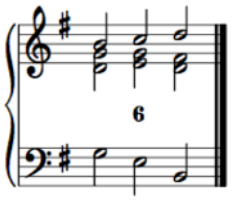
While **T(1 D2p 3)** is a perfectly acceptable way to accompany *mi–fa–sol* in the melody, a more interesting (and also more involved) way to harmonize that melody is what theorist Gene Biringer called the *champagne progression*: **T1 S6 T3**. (He called it this because it is "the progression you use when you want to impress a date.")

The champagne progression is very nice, but must be treated carefully. *Only* use it with *mi–fa–sol* (or *me–fa–sol*) in the melody, and *always* use the following voice-leading (note the non-standard doubling of the bass—*la*/*le*—in the **S6** chord).



T(1 S6d 3)

The standard champagne progression (above) uses a $\mathbf{I^6}$ chord for **T3**. Following is a variant using **III** for **T3**, which Biringer dubbed "pink champagne," because it is especially nice. It should also be especially *rare*, or it loses its punch.

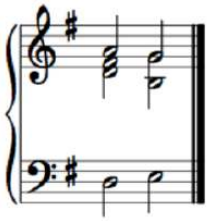


T(1 S6d 3)

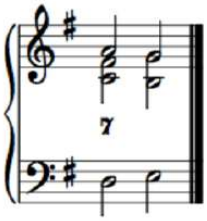
The champagne progression should only be used to prolong tonic function.

Deceptive resolution

A *deceptive resolution* occurs When a **D5** (**V** or $\mathbf{V^7}$) chord does not progress, as expected, to **I** to form an authentic cadence, but instead progresses to **VI**. In the deceptive resolution, it is important for *ti* to resolve to *do*—as it would in an authentic cadence—not *la*/*le*. This fulfills its role as a tendency tone, helps the "deception" to work, and avoids the dissonant augmented second *ti–le* in minor. This results in a non-standard doubling of VI (*do*, rather than the bass).



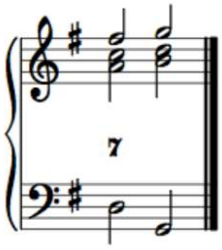
D5 Tx6



D5 Tx6

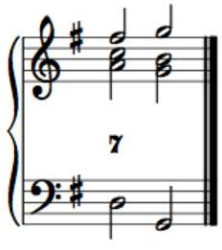
Leaving out the fifth

When *ti–do* appears in the melody of an authentic cadence involving **V**^{7}, it is impossible to fully voice both chords *and* resolve the functional dissonance.



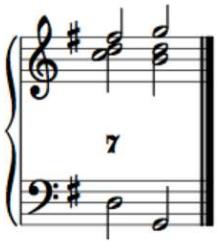
D5 T1

It is imperative to resolve this functional dissonance, as that resolution is an important contributor to the goal-oriented motion and the releasing of harmonic tension into the cadential arrival. In order to do so, either leave out the fifth of the **I** chord (and triple the bass):



D5 T1

or leave out the fifth of the **V**^{7} chord, and double the bass:

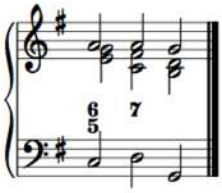


D5 T1

The incomplete **V**^{7} is preferable to the incomplete **I**, but voice-leading into the **V**^{7} will usually dictate which option you choose.

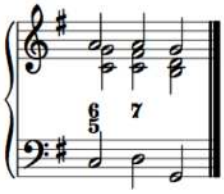
Leaving out the third

When an **S4** progresses into a **D5**, and both are *seventh chords*, it can be impossible to prepare and resolve the functional dissonances of both chords while fully voicing them.



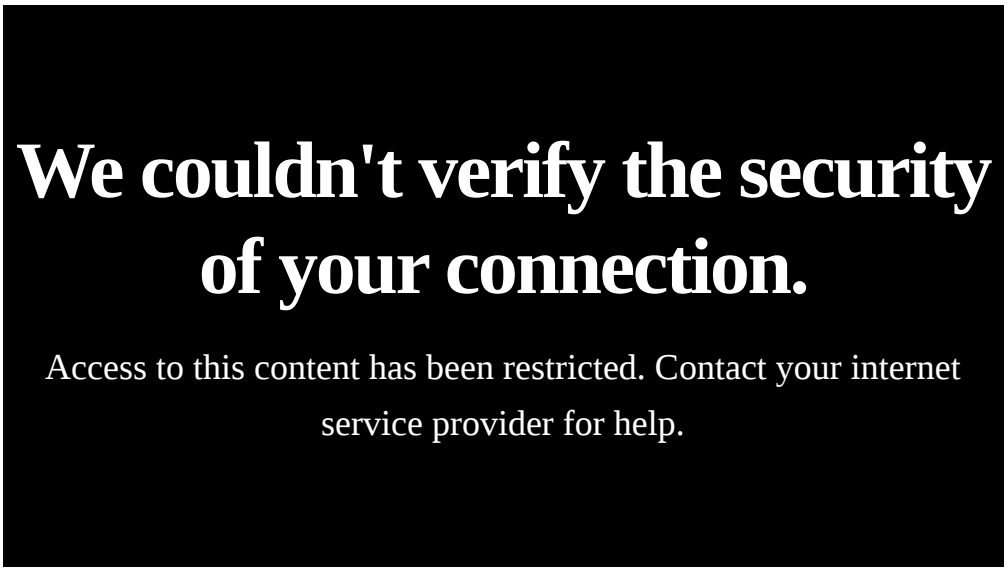
S4 D5 T1

Instead, leave *la*/*le* out of the **S4** chord and double the bass. This will retain the trigger and bass note *fa*, as well as the two pitches making the dissonance (*do* and *re* or *mi*/*me* and *fa*), and will allow a second *fa* in an upper voice that can prepare the seventh of the **D5** chord.



S4 D5 T1

2.16: Strict Four-Voice Composition - Realizing a Figured Bass Line in Melodic Keyboard Style

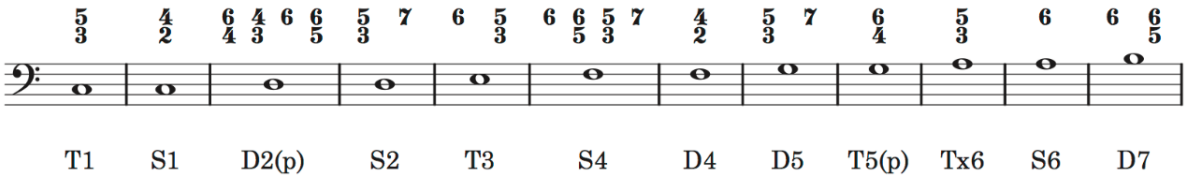


Realizing a figured bass in melodic keyboard style from Kris Shaffer on Vimeo.

2.17: Strict Four-Voice Composition - Realizing an Unfigured Bass Line

To realize an unfigured bass, first determine the harmonic functions projected by the scale-degree progression in the bass. Then choose figures for each bass note consistent with those functions. Lastly, realize the resulting figured bass according to the usual procedures.

The following chart provides the most common functions for each diatonic scale degree and the most common figures for each functional bass type. Keep in mind that once you have determined the functional progression, you may change the specific figures to smooth out the voice leading in the final realization.



View chart full size.

2.18: Strict Four-Voice Composition - Embellishing Tones

Passing Tone (PT)

A passing tone is a melodic embellishment (typically a non-chord tone) that occurs between two stable tones (typically chord tones), creating stepwise motion. The typical figure is *chord tone – passing tone – chord tone*, filling in a third (see example), but two adjacent passing tones can also be used to fill in the space between two chord tones a fourth apart. A passing tone can be either accented (occurring on a strong beat or strong part of the beat) or unaccented (weak beat or weak part of the beat).

Complete Neighbor Tone (NT)

Like the passing tone, a complete neighbor tone is a melodic embellishment that occurs between two stable tones (typically chord tones); however, a complete neighbor tone will occur between two instances of the same stable tone. Also like the passing tone, movement from the stable tone to the neighbor tone and back will always be by step. A complete neighbor can be either accented or unaccented, but unaccented is more common.

Double Neighbor Figure (DN)

Like the complete neighbor figure, the double neighbor figure begins and ends on the *same* stable tone (typically a chord tone). Between those two instances of the stable tone are two embellishing tones — one a step above and the other a step below the stable tone being embellished. Though individually we may consider each of the two embellishing tones to be incomplete neighbors (below), working together in the double-neighbor figure they balance each other out and create a contiguous whole, with the overall stability of a complete neighbor. A double neighbor figure is typically unaccented.

Incomplete Neighbor Tone (INT)

The incomplete neighbor tone is an unaccented embellishing tone that is approached by leap and proceeds by step to an accented stable tone (typically a chord tone). Broadly speaking an incomplete neighbor tone is any embellishing tone a step away from a stable tone that proceeds or follows it (and is connected on the other side by leap), but other kinds of incomplete neighbor tones have special names and roles that follow below.

Appoggiatura (APP)

An appoggiatura is a kind of incomplete neighbor tone that is accented, approached by leap (usually up), and followed by step (usually down, but always in the opposite direction of the preceding leap) to a more stable tone (typically a chord tone).

Escape Tone (ESC)

An escape tone, or *echappée*, is a kind of incomplete neighbor tone that is unaccented, preceded by step (usually up) from a chord tone, and followed by leap (usually down, but always in the opposite direction of the preceding step).

Anticipation (ANT)

An anticipation is essentially an otherwise stable tone that comes too early. An anticipation is typically a non-chord tone that will occur immediately before a change of harmony, and it will be followed on that change of harmony by the same note, now a chord tone of the new harmony. It is typically found at the ends of phrases and larger formal units.

Syncopation (SYN)

Syncopation occurs when a rhythmic pattern that typically occurs on strong beats or strong parts of the beat occurs instead on weak beats or weak parts of the beat. Like the anticipation, the syncopated note is an early arrival — it tends to belong to the chord on the

following beat. Unlike the anticipation, the syncopation is tied into a note in that chord; it is not rearticulated. Rather than anticipating a note in the chord that follows, a syncopation is simply an early arrival.

Suspension (SUS)

A suspension is formed of three critical parts: the *preparation* (accented or unaccented), the *suspension* itself (accented), and the *resolution* (unaccented). The preparation is a chord tone (consonance). The suspension is *the same note* as the preparation and occurs simultaneous with a change of harmony. The suspension then proceeds down by step to the resolution, which occurs over the same harmony as the suspension. The suspension is in many respects the opposite of the syncopation: if the anticipation is an early arrival of a tone belonging to the following chord, a suspension is a lingering of a chord tone belonging to the previous chord that forces the late arrival of the new chord's chord tone. However, in composition and improvisation, the suspension must be treated with a great deal more care than the syncopation. The most common suspensions (and their resolutions) in upper voices form the following intervallic patterns against the bass: 9–8, 7–6, 4–3. (With the exception of 9–8, the pitch class of the resolution tone should never sound in another voice simultaneous with the suspended tone.) Instead of *SUS*, it is more typical to notate the intervallic pattern in the thoroughbass figures.

Retardation (RET)

A retardation is essentially an upward-resolving suspension. It is almost always reserved for the final chord of a large formal division (or a movement), and it frequently appears simultaneously with a suspension (as seen in the example). Instead of *RET*, it is preferable to notate the intervallic pattern in the thoroughbass figures.

CHAPTER OVERVIEW

3: Harmony

3.1: Introduction to Musical Functions
3.2: Harmonic Functions
3.3: Harmonic Syntax - The Idealized Phrase
3.4: Harmonic Syntax - Prolongation
3.5: Performing a Harmonic Analysis
3.6: Classical Cadence Types
3.7: Chromatically Altered Subdominant Chords
3.8: Applied Chords
3.9: Modal Mixture
3.10: Modulation
3.11: Handouts and Charts

3.1: Introduction to Musical Functions

The concept of musical functions is foundational to musical analysis, and essential to the understanding of musical styles.

A musical *function* describes the role that a particular musical element plays in the creation of a larger musical unit. Function is tied very much to the idea of expectation: given a certain element in a certain context, what element(s) is/are likely to come next? Likewise, how does a given element fulfill or deny the expectations set by what came before it?

A musical function typically has two defining features: the characteristics of the musical elements that tend to belong to that function (what notes tend to be found in the chord, for example), and the kinds of elements (or functions) that tend to precede or follow it in a succession of musical elements. Note that this is entirely dependent on the typical patterns of a musical *style*. Different styles of music may exhibit different functions or different behaviors for the same functions. The study of function and the study of style are inextricably linked.

The two musical traits most commonly studied for their functional properties in Western art and popular music are *harmony* and *form*. The study of both harmonic functions and formal functions will lead to an understanding of harmonic and formal *syntax*: the norms or principles according to which musical elements are combined into meaningful and stylistically appropriate successions. The study of harmony or form, then, is not a matter of learning to label chords, phrases, and modules correctly. It is a matter of *interpreting the role that chords, phrases, modules, etc. play in the larger context in which they are found*. That, of course, requires fluency in identifying (and thus labeling) individual musical elements. But identification is only the beginning of a much bigger, and more interesting, process of analysis. And it is that analytical work that will lead to true understanding of the pieces of music analyzed, and the styles to which they belong.

3.2: Harmonic Functions

If a musical function describes the role that a particular musical element plays in the creation of a larger musical unit, then *a harmonic function describes the role that a particular chord plays in the creating of a larger harmonic progression*. Each chord tends to occur in some musical situations more than others, to progress to some chords more than others. These tendencies work together to create meaningful harmonic progressions, which can in turn form the harmonic foundation for musical *phrases*, *themes*, and larger formal units.

Generally speaking, the function of a chord concerns the notes that belong to it (its *internal characteristics*), the chords that tend to precede and follow it, and where it tends to be employed in the course of a musical phrase.

A theory of harmonic functions is based on three fundamental principles:

- Chords are collections of scale degrees.
- Each scale degree has its own tendencies.
- The collective tendencies of a chord's scale degrees in combination is the chord's function.

(Note the absence of *root* and *quality* from consideration here.)

Because tendency is style-specific, the same chord can have different functions in different musical styles. For instance, the kinds of functions we find in classical music are different from those we find in pop/rock songs from the Billboard charts. And though there are some general harmonic traits that are common to most eighteenth- and nineteenth-century Western composers (what we call the "common practice"), when we look in closer detail, we find some significant differences in the way Bach, Mozart, Brahms, and others compose their harmonic progressions.

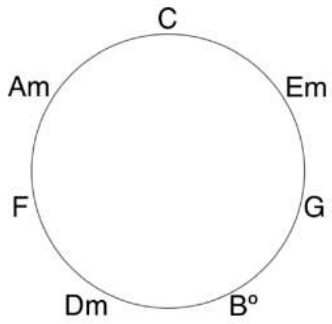
Our initial exploration of harmonic functions will engage the general "common practice" that is shared by most eighteenth- and nineteenth-century Western composers. As we explore specific genres, composers, and works within that common practice, we will have opportunity to explore the more nuanced differences between composers, as well as to move beyond common-practice Western art music to include other styles, such as pop/rock.

The three common-practice harmonic functions

In common-practice music, harmonies tend to cluster around three high-level categories of harmonic function. These categories are traditionally called *tonic* (**T**), *subdominant* (**S** — also called *predominant*, **P** or **PD**), and *dominant* (**D**). Each of these functions has their own characteristic scale degrees, with their own characteristic tendencies. And each of these functions tend to participate in certain kinds of chord progressions more than others.

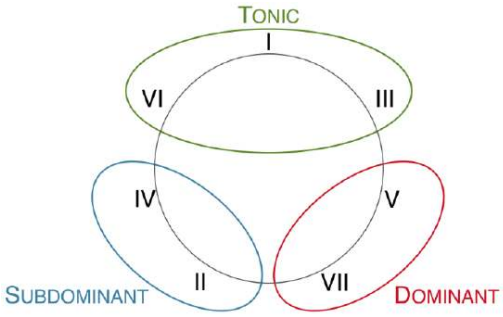
If you are already comfortable with Roman numerals, you can generally think of **I**, **III**, and **VI** as *tonic*, **II** and **IV** as *subdominant*, and **V** and **VII** as *dominant*. (Though, as you will see below, there is more to it than that.)

To visualize these functional categories, think of the usual triads in C major arranged on a circle of thirds. Note that each chord sits between the two triads that share the most tones in common — C major (C, E, G) sits between E minor (E, G, B) and A minor (A, C, E), both of which share two tones in common with C.



Convert these chords to Roman numerals (in C major), and we can see the functions. Since the function is determined by the tendencies of the tones that they share, and since on this graph chords are grouped together by notes they have in common, they are

also grouped together by function.



Triads arranged on the circle of thirds, labeled by harmonic functions.

Interestingly, in common-practice music, a chord's function can be determined solely by its internal characteristics (the notes that make up the chord). This is not true of all styles. For example, in pop/rock music a **IV** chord can exhibit very different functional tendencies depending on its context. But in classical music, simply knowing the notes in a chord is enough to determine its general harmonic function and the general tendencies of that chord and its individual notes.

The syntactic properties of these functions will be covered elsewhere. What follows simply explains how to determine the function of a chord in common-practice music with greater specificity.

Finding the function of a chord

Each of the three harmonic functions — *tonic* (T), *subdominant* (S), and *dominant* (D) — have characteristic scale degrees. Tonic's characteristic scale degrees are 1, 3, 5, 6, and 7. Subdominant's characteristic scale degrees are 1, 2, 3, 4, and 6. Dominant's characteristic scale degrees are 2, 4, 5, 6, and 7.

Ian Quinn (a music theorist at Yale University) further distinguishes these scale degrees, using the categories of functional *triggers*, functional *associates*, and functional *dissonances*. These categories help us understand the functional properties of chords whose scale degrees belong to more than one function, as well as how certain notes behave within a chord. They also help us understand which scale degrees are more or less characteristic of a function — something that will help determine function when a complete chord is not present.

FUNCTION	TRIGGERS	ASSOCIATES	DISSONANCES
T	1 and 3	5 and 6	5 (if 6 is also present) and 7
S	4 and 6	1 and 2	1 (if 2 is also present) and 3
D	5 and 7	2	4 and 6

In terms of moveable-*do* solfège:

FUNCTION	TRIGGERS	ASSOCIATES	DISSONANCES
T	*do* and *mi*/*me*	*sol* and *la*/*le*	*sol* (if *la*/*le* is also present) and *ti*/*te*
S	*fa* and *la*/*le*	*do* and *re*	*do* (if *re* is also present) and *mi*/*me*
D	*sol* and *ti*/*te*	*re*	*fa* and *la*/*le*

To determine the function of a chord, find the function that includes all the scale degrees of a chord (regardless of chromatic alterations — that is, treat ♯4 the same as regular scale-degree 4). If more than one function contains all the scale degrees, take the function with the most triggers in the chord.

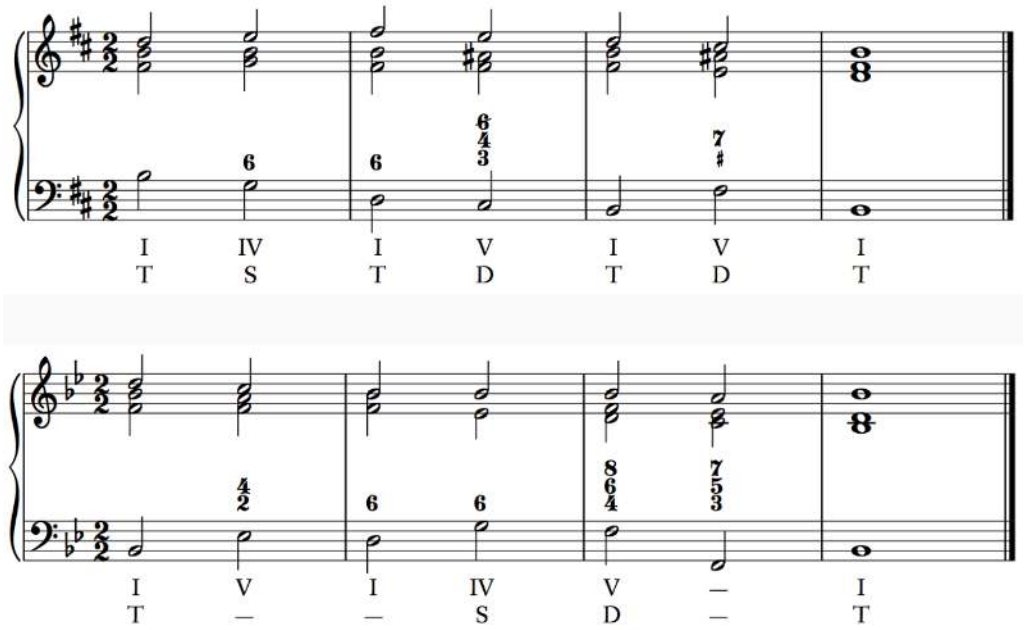
There is one exception to this (for now): a chord with scale degrees 6, 1, and 3 is a special kind of tonic chord, called a *destabilized tonic*. Quinn uses the special functional label is **Tx**, rather than simply **T**, for this chord.

Also note that because the III^7 chord's scale-degrees do not wholly belong to any of the three functions, it can behave similar to **T** and **D** chords, depending on context. It is a rare chord in its diatonic form.

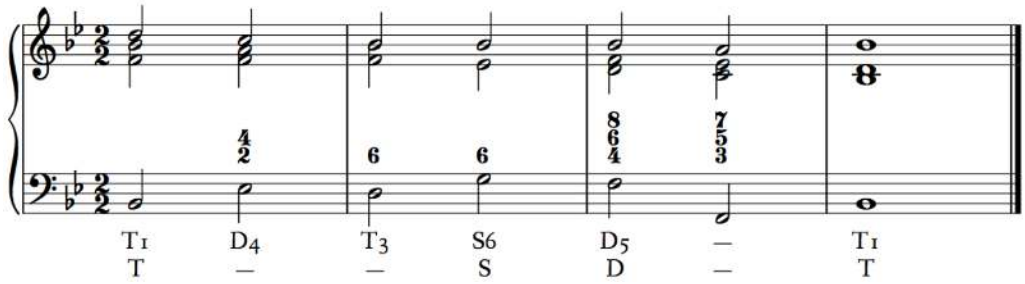
This handout will help you determine the function of a chord from the bass scale degree and/or the Roman numeral.

Labeling chords

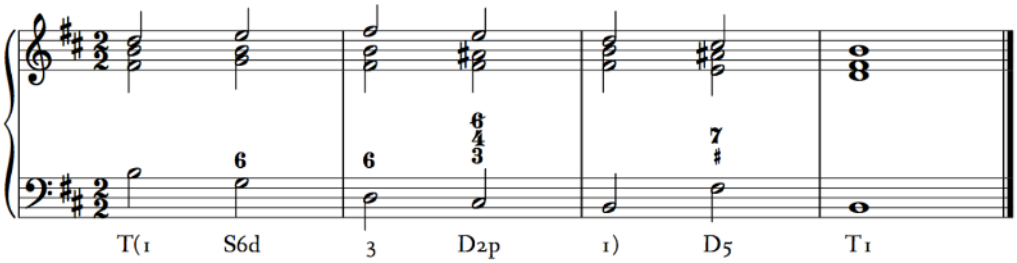
There are two ways in which we will label chords according to function. The first is to label chords with Roman numerals, thoroughbass figures, and functional labels. When doing so, place the appropriate Roman numeral *below* the bass line, the thoroughbass figure *above* the bass line (since it represents the upper voices), and place a functional label **T**/**S**/**D** below the Roman numeral (no **Tx**; simply call a **VI** chord **T**). For now this label can simply apply T, S, or D to individual chords; in the future, we will alter this practice slightly in order to show functional prolongation. The first example shows individual chord functions, and the second example shows functional prolongation.



The second way to label a harmonic progression is what Quinn calls *functional bass*. Functional bass symbols combine a chord's function (**T**, **S**, **D**, or **Tx**) with an Arabic numeral denoting the scale degree of its bass note. A tonic chord with *do* in the bass is **T1**, a dominant chord with *ti* in the bass is **D7**, etc. If the bass note is chromatically altered, use a + or **–** to denote raised or lowered (*la* and *ti* in minor do not count, since *le*, *la*, *te*, and *ti* all belong to minor, but you can use +/– for clarity if you like). And if there is a chromatically altered note anywhere in the chord, put the functional bass symbol inside square brackets: **[S6]**, **[S+4]**, **[T–7]**, etc. (See Chromatically altered subdominant chords, Applied chords, and Modal mixture for more information on common chromatically altered chords.)



Quinn also advocates using what I call *interpreted functional bass*. This nomenclature uses the same symbols, but uses parentheses to denote *contrapuntal prolongation* and lower-case postscripts to explain the contrapuntal role of the embellishing chord (p for passing, n for neighbor, i for incomplete neighbor, d for divider, e for embellishing — all of these refer to the voice-leading pattern in the bass voice). Following is an example of interpreted functional bass.



In this text, we primarily use the first method of Roman numerals and (prolonged) harmonic functions, since it is the most common in North American music theory. However, functional bass can be helpful for identifying categories of chords that belong together. For example, in a dictation or transcription task, we might hear *re* in the bass but not know what specific chord it is. If context tells us it is likely a dominant chord, rather than subdominant, we can label it **D2**. This rules out **II** (a subdominant chord) but keeps open multiple dominant options like $\mathbf{V^{6/4}}$ or $\mathbf{VII^{6}}$ until we are able to make a final determination. Similarly, when composing, there are patterns that might take an **S4**, with the specific chord (**IV** or $\mathbf{II^{6}}$) determined by voice-leading rather than harmonic syntax, but where a **D4** chord ($\mathbf{V^{4/2}}$) would be syntactically inappropriate, regardless of voice-leading.

Thus, when referring to specific chords, we will use Roman numerals to label the chords and functional labels to interpret their role in context. When referring to broader categories of chords, we will more often use functional bass.

3.3: Harmonic Syntax - The Idealized Phrase

Harmonic syntax concerns the norms or principles according to which harmonies (chords) are placed into meaningful successions. These norms include progressions that are more or less common than others. Those norms generate expectations for listeners familiar with the style: if **IV–V** is more common than **IV–VI**, the appearance of a **IV** chord generates an expectation that the next chord is more likely to be **V** than it is to be **VI**.

In Western classical music, harmonies generally group into three *harmonic functions* — tonic (T), subdominant (S), and dominant (D) — and these functions group together chords that progress to and from other chords in similar ways. For example, since **II** and **IV** are both subdominant chords, they will participate in many of the same kinds of chord progressions, and at times can be substituted for each other with only a minimal change to the musical effect.

On a local level (chord-to-chord progressions), we can summarize the tendencies of these functions with the cycle **T–S–D–T**. That is, harmonies tend to progress through a cyclical progression of those three functions:

> ***T → S → D → T →*** *and so on . . .*

That does not rule out T progressing to D, D progressing to S, etc. But it does mean that those progressions tend to be less common, at least in classical music.

Higher-level musical structures also impact the norms according to which these harmonic functions progress. For now, we will consider one higher-level structure that influences chord-progression tendencies — the phrase — and we will limit our study to isolated, complete, self-sufficient phrases. This is an idealized, oversimplified setting — like strict voice-leading — that is useful for learning the basics. Some such phrases even exist in real music! But most of the time there are a number of competing factors that influence the chord-progression strategies employed by a composer at any given moment. However, the idealized phrase is a helpful starting point. Future study will explore how classical composers employ harmonic progressions in larger musical works that combine multiple phrases (which are not self-sufficient) into larger themes and movements.

The idealized phrase

The *idealized phrase* (also called the *phrase model*) is a single musical phrase that progresses through an entire cycle of harmonic functions, beginning and ending on tonic. (Strict voice-leading exercises are such phrases.) These phrases begin with a point of stability (tonic), move away from that stable point, and then eventually lead to a point of high tension and resolution (an *authentic cadence*). This pattern of stability–instability–stability, or rest–motion–rest, with a single goal at the end, should be familiar both from species counterpoint and from strict keyboard-style voice-leading. (This pattern also governs large-scale formal structures in classical music.)

The simplest phrase that exhibits this complete harmonic cycle is a tonic-dominant-tonic progression: **I–V–I.** This phrase begins and ends with the most stable harmony (**I**), and includes an *authentic cadence* (**V–I**). The **V** is the high point of instability, containing the tendency tone (*ti*) that most strongly points to the final point of arrival (*do*, or tonic).

This harmonic cycle can be expanded by inserting a subdominant chord, a destabilized tonic chord, or both, as in the following examples:

> ***I IV V I***
> ***I II V I***
> ***I VI V I***
> ***I VI II V I***

In *functional bass* terms, any harmonic progression that follows the pattern

> ***T1 → (S_) → D5 → T1***

can serve as the basis for a complete idealized phrase. (Harmonies in parentheses are optional.)

Phrases are seldom 3–5 chords long, however, and a harmonic function can be expressed by more than a single chord. Thus we can understand the harmonic functions not simply as chords, but as *zones* of varying length in a phrase, which can be created by a

number of chords or short chord progressions. More generally, then, our idealized musical phrase contains a single progression of functional zones **T** → **(S)** → **D** → **T**, begins with **T1**, and ends with an authentic cadence (**D5–T1**), as seen in the example below.

Triggering and prolonging harmonic functions in an idealized phrase

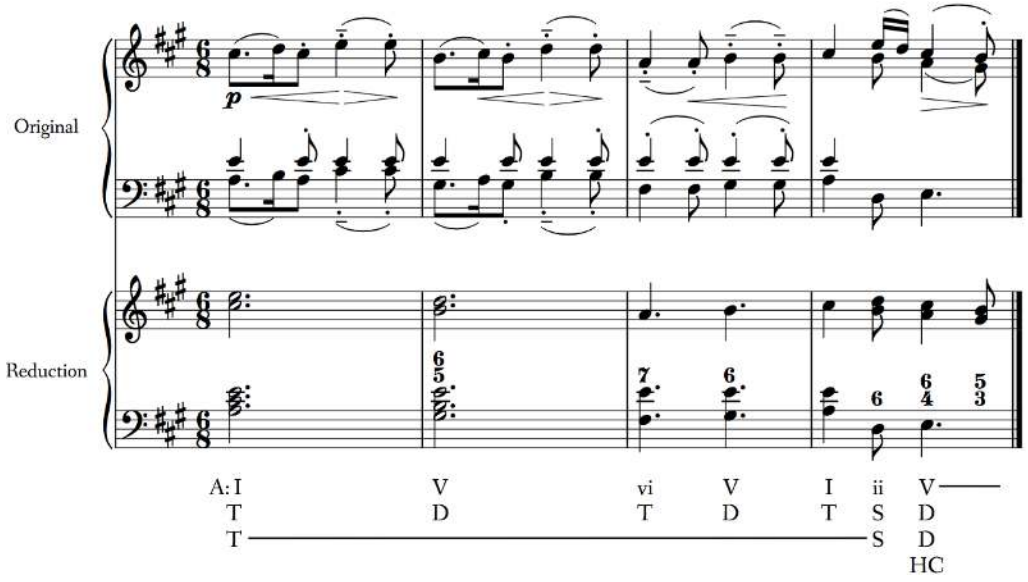
To establish, or trigger, a harmonic functional zone, composers tend to use *a fixed scale degree in the bass*. In other words, tonic tends to be triggered by **T1** (always **I**), subdominant by **S2** or **S4** (including a variety of **II** and **IV** chords, in in root position or inversions, with and without sevenths), and dominant by **D5** (**V**, with or without a seventh, or a *compound cadence*). These four categories of chords — **T1**, **S2**, **S4**, and **D5** — are called *functional chords* (because they trigger the function) or *cadential chords* (because they can participate in a cadence).

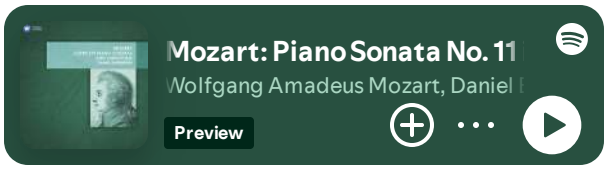
Other chords are often called *contrapuntal chords* or *embellishing chords*, and are typically used to *prolong* a function throughout the zone.

Functional prolongations are shown in a harmonic analysis by writing/typing T, S, or D underneath the individual chord labels (Roman numerals or functional bass) and extending a line from the beginning of the functional zone to the end.

The following excerpt is from Mozart's Piano Sonata in A Major, K. 331, I., mm. 1–4, with a harmonic reduction and analysis provided below the original score. Such an analysis is called an *interpreted* harmonic analysis, because the harmonies are interpreted according to the way they behave in the phrase, rather than merely labeled. In this phrase, note the following:

- The tonic zone is triggered by a root-position tonic triad (**I** or **T1**).
- Contrapuntal dominant chords (**D7** — first-inversion dominant chords) create a passing bass motion between the opening **I** chord, the **vi** in m. 3, and the return of **I** in m. 4.
- The cadential progression begins in m. 4 with the move from **I** to **ii^6** (**S4**) and then to the cadential six-four and dominant triad (**D5**). Note that the entirety of the cadential progression in m. 4 is made up of *cadential chords* — chords with fixed scale degrees in the bass.
- In contrast, the entire tonic-prolongation zone is made up of *contrapuntal chords* — variable scale degrees in the bass — with the exception of the **I** chord that triggered the tonic function.
- The **vi** chord is a root-position chord, but still an embellishing chord, while the **ii^6** is an inverted chord, but still a functional/cadential chord. The difference is not the inversion, but the scale degree of the bass.





Not all classical phrases as neatly fit the general trends outlined in this resource. As discussed in Style and tendency, the principles of harmonic syntax are both reliable and bendable/breakable, and it is often the music that bends/breaks the "rules" in interesting ways that we care about the most. So in your own analyses, keep these principles in mind as *general* principles, and simultaneously look for where composers meet these expectations as well as where they break them.

For more details on the triggering and prolonging of harmonic functions in a classical phrase, see Harmonic syntax – prolongation.

3.4: Harmonic Syntax - Prolongation

Following are the primary techniques used to prolong functional zones in an idealized classical phrase. Examples of specific progressions and notational conventions are provided.

Change-of-figure prolongation

A *change-of-figure prolongation* occurs when the bass repeats (or is sustained, or drops an octave) while one or more of the upper voices change. The function remains the same (T/S/D), but the Roman numeral may change.

Examples include progressions like **V–V^7** (both **D5**) or **IV–II^6** (both **S4**).

Change-of-bass prolongation

A *change-of-bass prolongation* occurs when two chords of the same function appear back-to-back, but with different bass pitch classes. In some cases, these are changes of inversion: **I–I^6**, for example. In other cases, the root changes: **I–III** or **IV–II**, for example. What makes these progressions prolongations is that the function remains the same. **I–I^6** prolongs tonic function (**T1–T3**), and **IV–II** prolongs subdominant function (**S4–S2**).

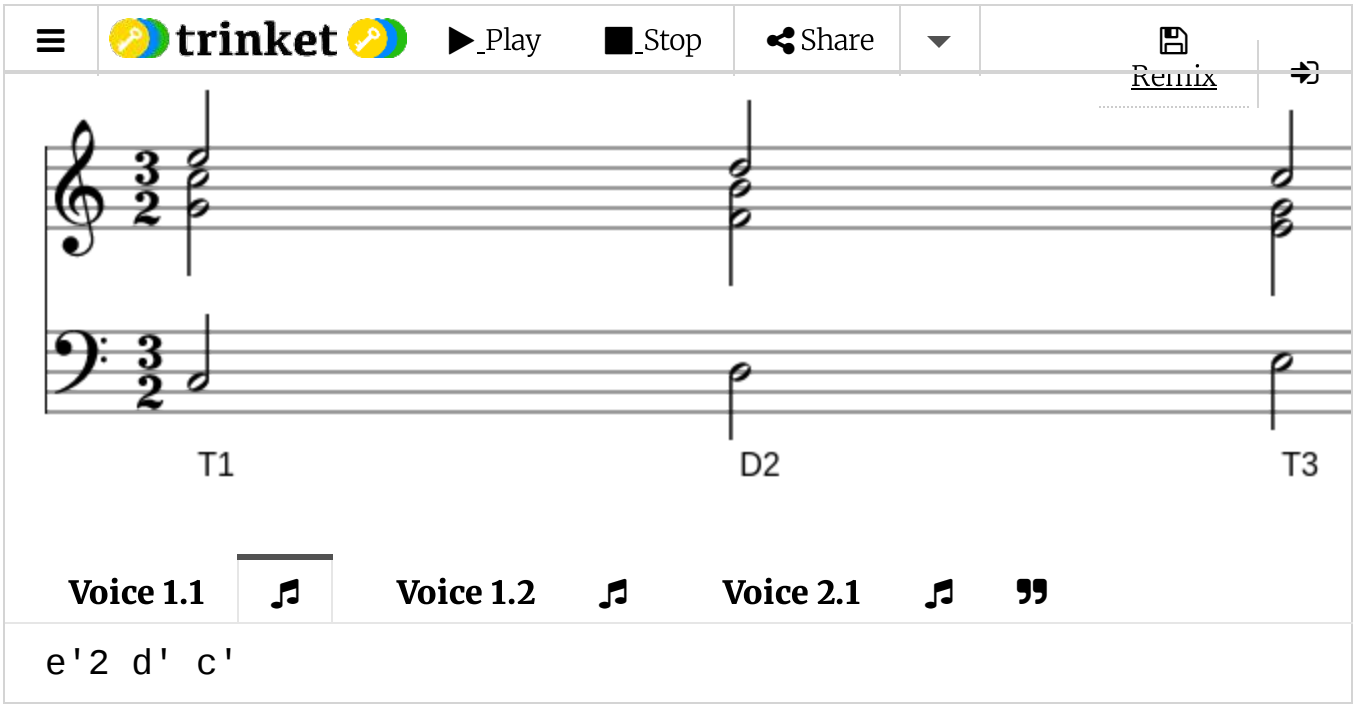
Contrapuntal prolongation – passing chord

Many change-of-bass prolongations involve a skip of a third in the bass, such as **I–I^6** (**T1–T3**). Just as in second-species counterpoint a melodic third from downbeat to downbeat invites the use of a weak-beat passing tone, a melodic third in the bass between these two chords invites the use of a *passing chord*.

The bass note of a passing chord will fill in the third with stepwise motion. The melody will also often contain passing motion.

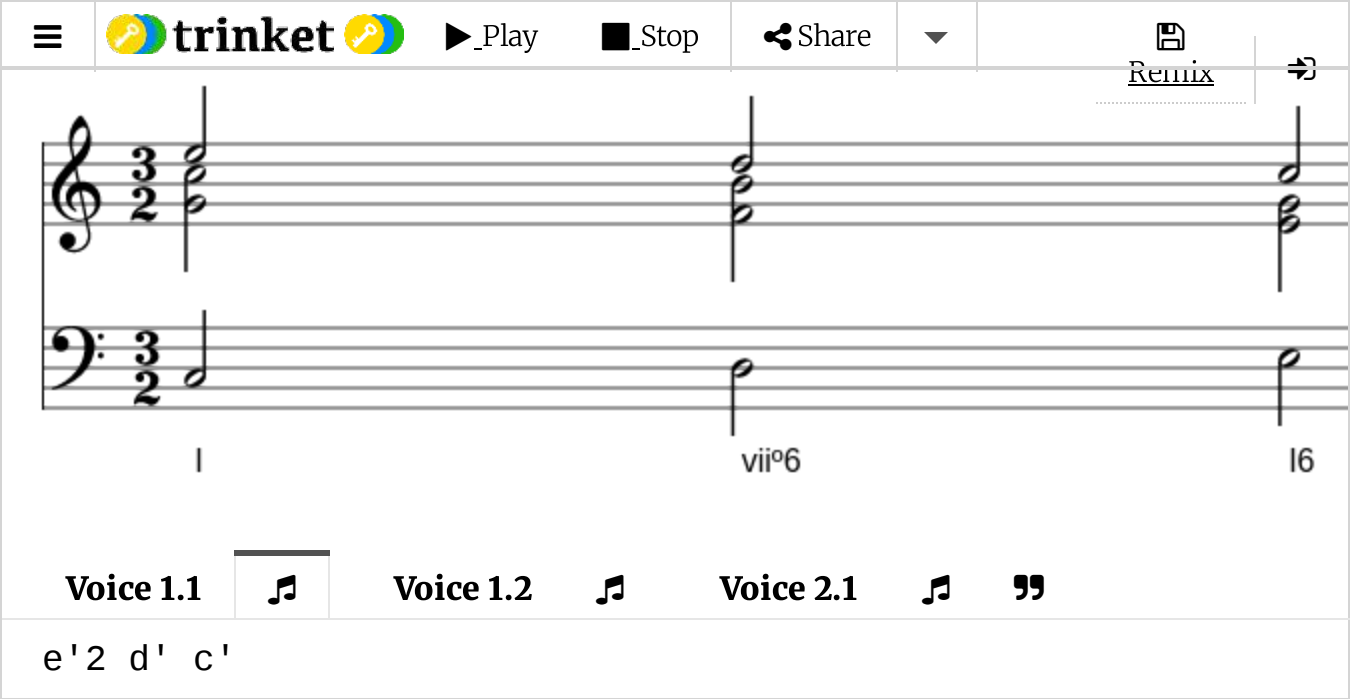
A function is typically prolonged by contrapuntal chords belonging to the function that precedes it in the standard cycle. T is prolonged by D, D by S, and S by T.

A passing chord that prolongs the above **T1–T3** progression would then be a dominant chord (D precedes T) with scale-degree 2 in the bass (the passing tone between scale degrees 1 and 3): **D2**.



Common **D2** chords are **V$^{6/4}$**, **V$^{4/3}$**, and **VII^6**. Thus, a **I–I^6** prolongation can involve those as passing chords. The following **T1 D2 T3** progression uses a **vii^{o}6** to prolong tonic. Listen to this example, and then try to change the progression to a properly voiced **I**

$\mathbf{V^{6/4}\ I^{6}}$ progression.

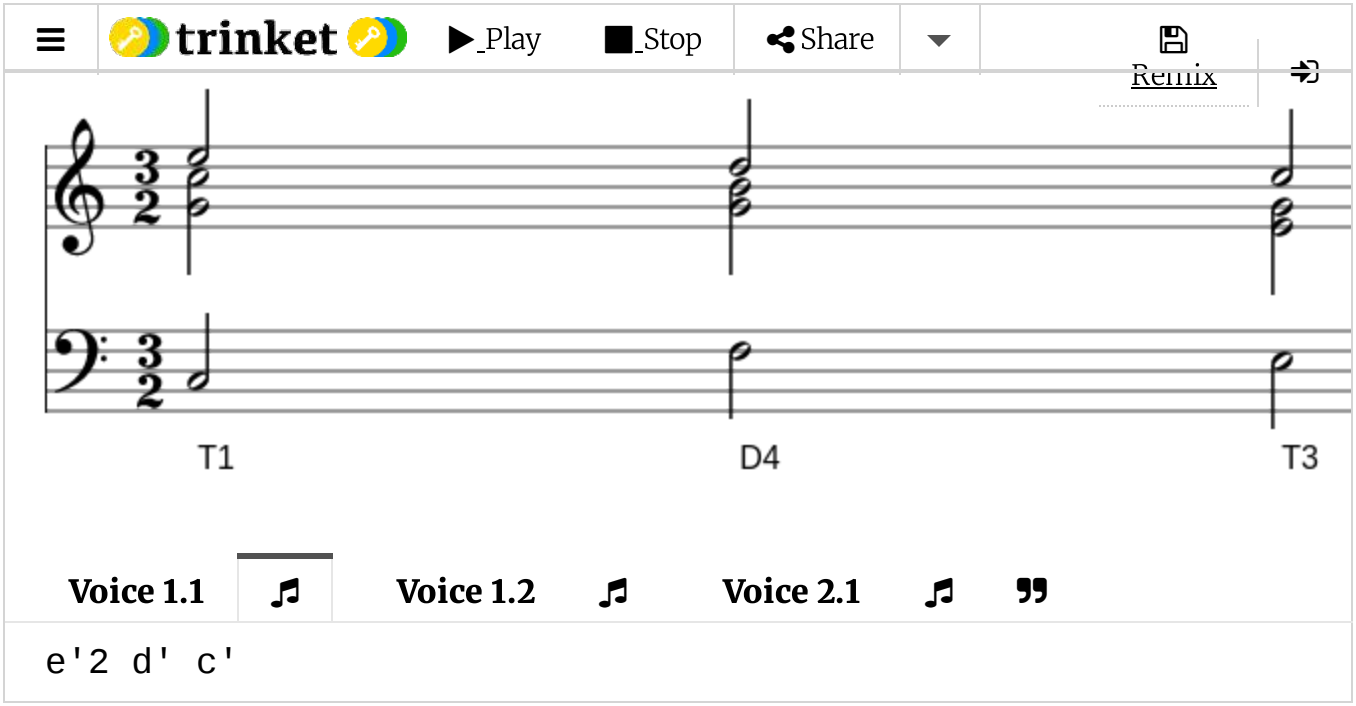


Note that while scale-degree 2 in the bass can support a **II** chord, **II** is subdominant, and so it is *not* used as a passing chord to prolong tonic.

Contrapuntal prolongation – incomplete neighbor chord

In second-species counterpoint, variety could come by using a *substitution* in place of a passing tone. This leap of a fourth followed by step in the opposite direction still outlines a third from downbeat to downbeat, but offers a break from too much stepwise motion in the counterpoint.

In harmonic writing, the same effect is obtained by an *incomplete neighbor chord*. The bass follows the same incomplete-neighbor pattern as the second-species counterpoint, and the function of the contrapuntal chord is the same as its passing-chord counterpart. Thus instead of a passing motion of **T1 D2 T3**, a substitution pattern in the bass would produce **T1 D4 T3**. (In Roman numerals, that progression would almost invariably be $\mathbf{I\ V^{4/2}\ I^{6}}$, as it is in the following example.)

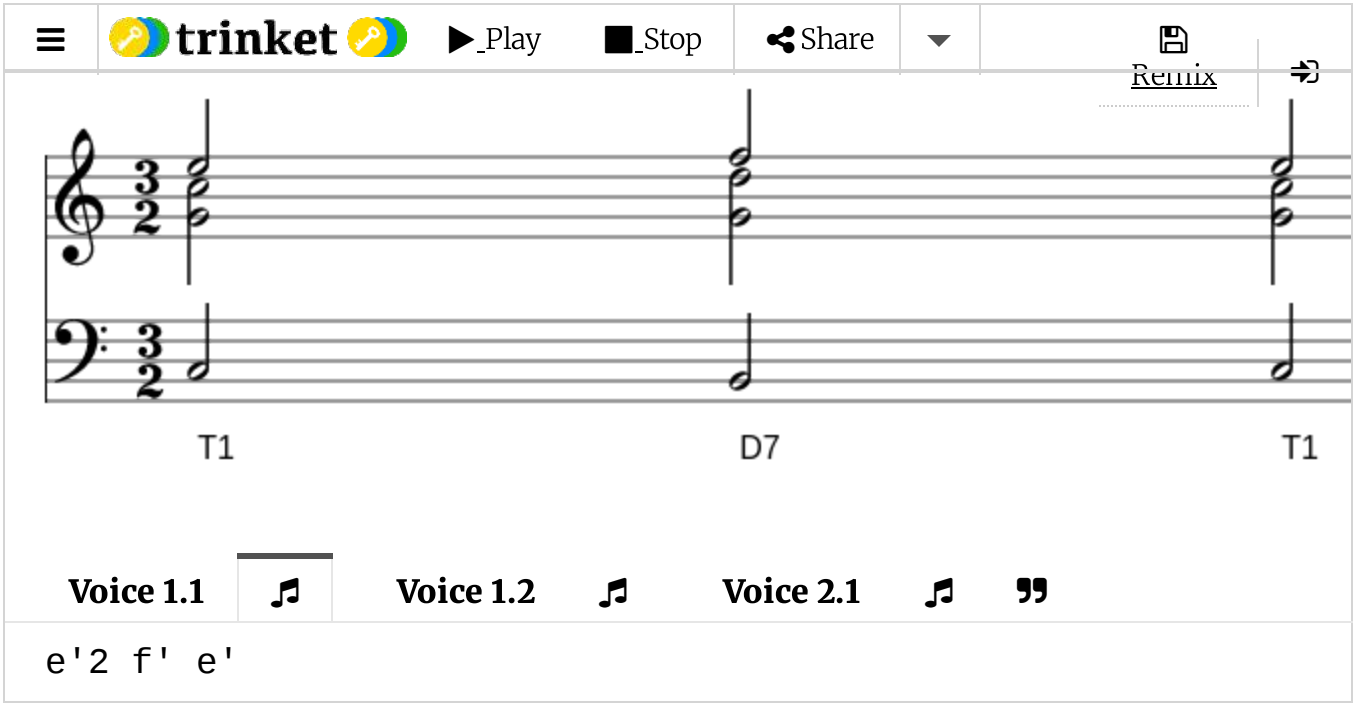


Contrapuntal prolongation – complete neighbor chord

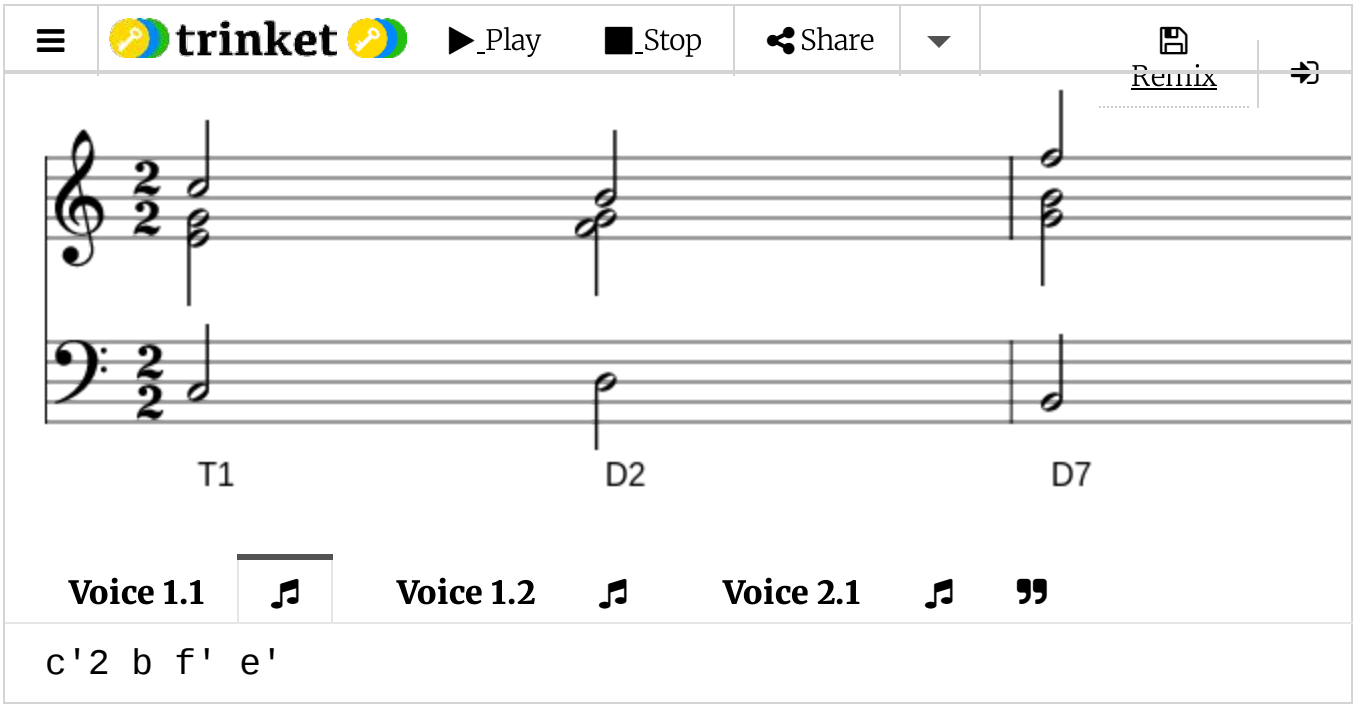
Just as a *neighbor tone* in second- or third-species counterpoint could be used to ornament a single tone and return to it, a *neighbor chord* uses a neighbor-tone motion in the bass to prolong a function and return to the original bass pitch. The function of a neighbor chord follows the same principle as the passing or incomplete neighbor chord. Following are some examples of neighbor-chord prolongations:

- **T1 D7 T1**
- **T3 D4 T3**
- **S4 T3 S4**
- **D7 S6 D7**

Here is a **T1 D7 T1** neighbor prolongation in strict keyboard style. What is the Roman numeral and figured bass for the **D7** chord? What is the least number of changes you can make to it in order to transform it into **T3 D4 T3**?



Just as third-species counterpoint has a *double neighbor* figure, harmonies can be prolonged by two chords using a double-neighbor figure in the bass. The most common double-neighbor prolongation is **T1 D2 D7 T1** (commonly **I V4/3 V6/5 I**).



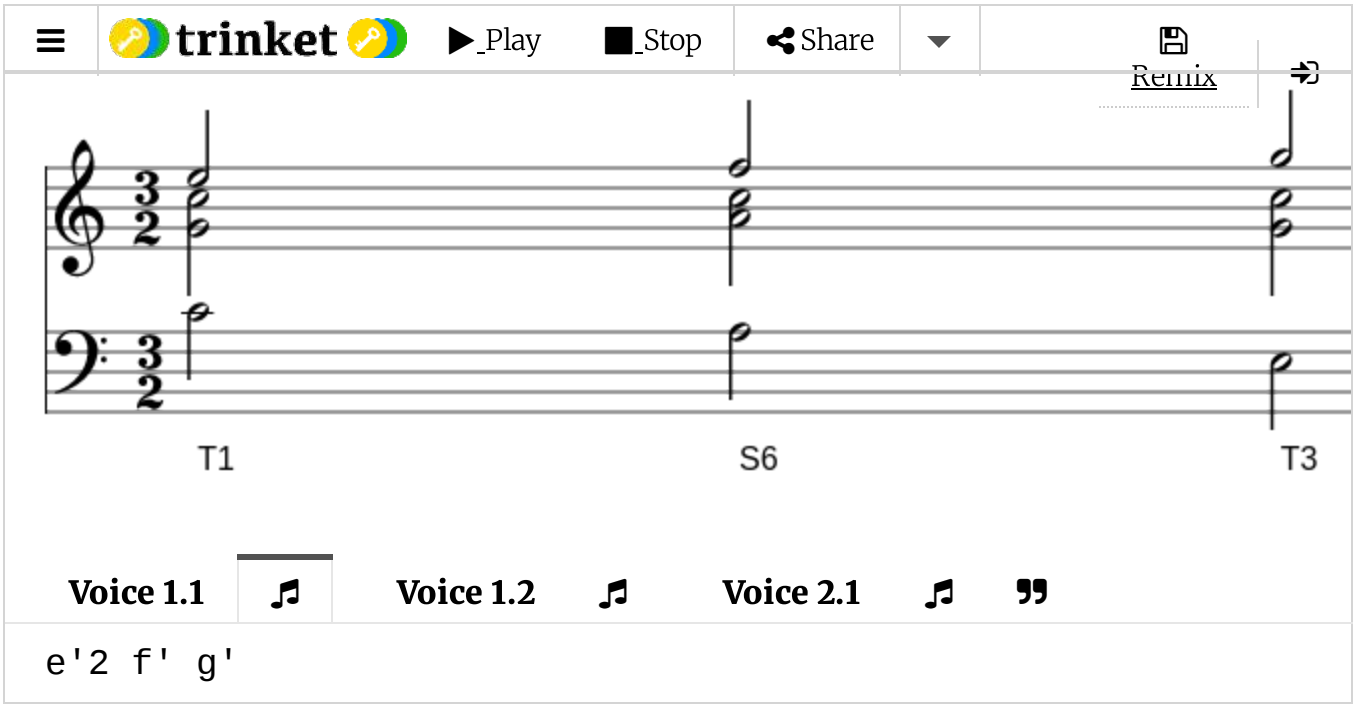
Contrapuntal prolongation - divider and embellishing chords

In second-species counterpoint, an *interval subdivision* divided a large leap between downbeats into two smaller leaps. Likewise, a *divider chord* takes a large leap between bass notes in a change-of-bass prolongation (or a simple octave leap in the bass) and divides it into two smaller leaps.

Divider chords almost always prolong tonic function, and can do so using either subdominant or dominant dividers. The most common divider-chord prolongations are:

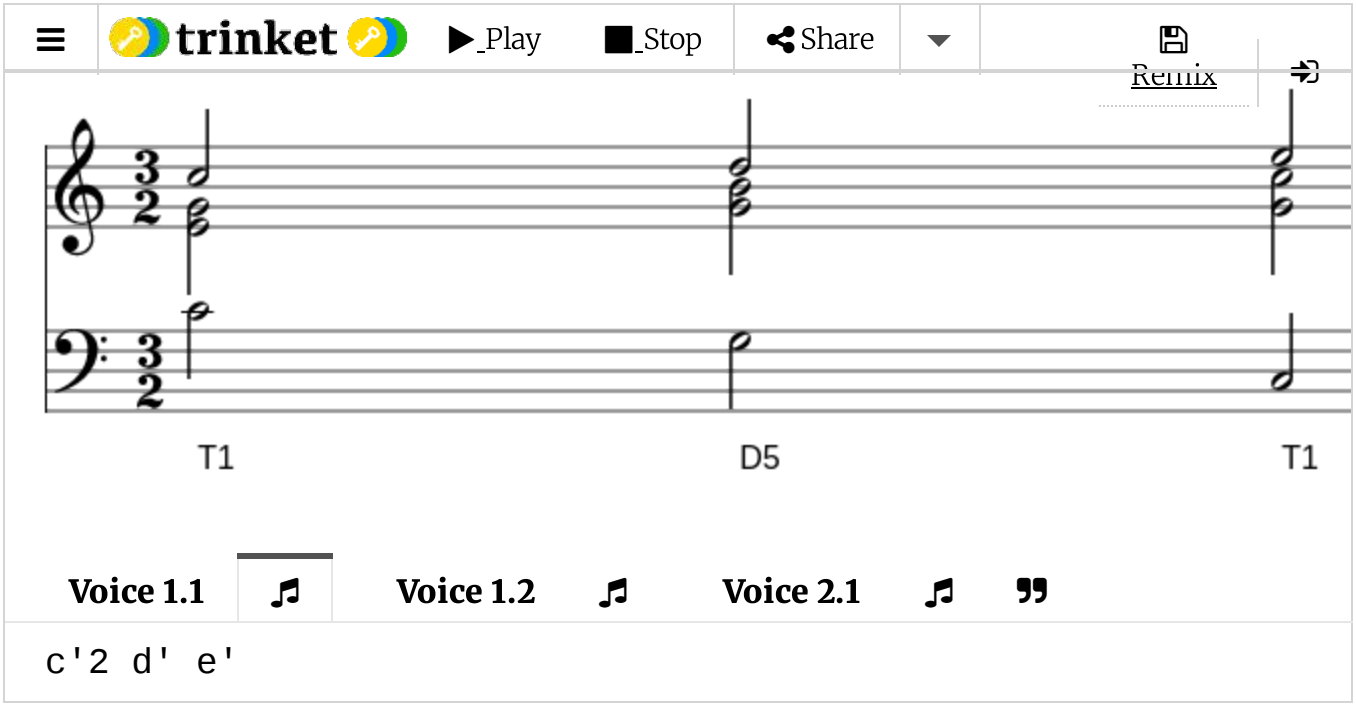
- **T1 D5 T1** (**I V$^{(7)}$ I**), where the bass ascends or descends an octave between **T1** chords.
- **T1 S4 T1** (**I IV I**), where the bass ascends or descends an octave between **T1** chords.
- **T1 S6 T3** (**I IV^6 I^6** or **I IV^6 III**), dubbed the *champagne progression* by theorist Gene Biringer, because it is "the progression you pull out when you want to impress a date."

Following is a champagne progression. Which version is it (**I^6** or **III**)? What one thing must change in order to form the other version? What default voice-leading rule is "broken" in this progression? (Note, because of rule conflicts, this progression will always break that rule, and it will always have these scale degrees in the melody.)



In the case of **T1 D5 T1** and **T1 S4 T1**, the same harmonic progression can occur without the bass changing register. In other words, the bass leaps from *do* to *sol* or *fa*, but returns to the original bass note. Instead of dividing a large leap, the bass note of the intervening chord looks like an *embellishing tone* from third species. (In third-species counterpoint, an *embellishing tone* ornaments another tone by leaping to another consonance — usually a third or fourth away — and returning to the original tone.) Thus, what would otherwise be a *divider chord* is instead an *embellishing chord*.

Following is a **T1 D5 T1** *divider* prolongation. What single change can make it an *embellishing chord* prolongation?



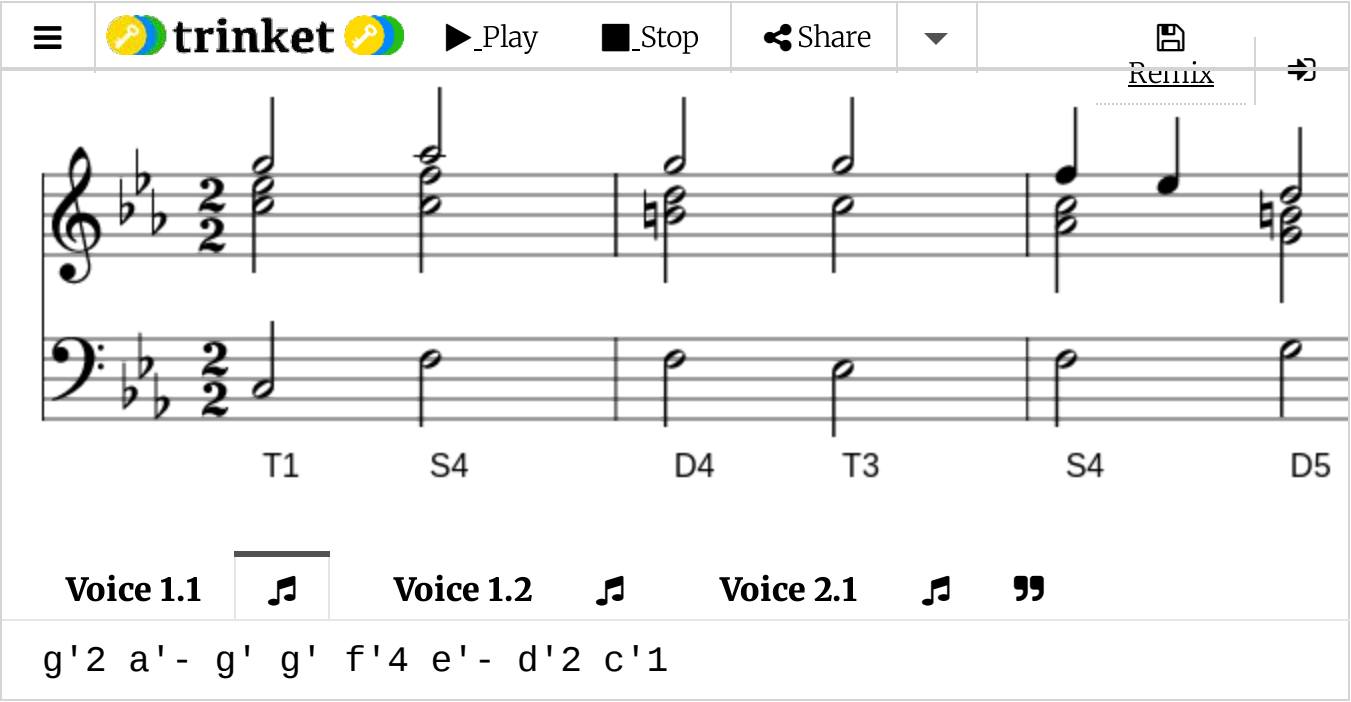
Subsidiary harmonic progressions

The last type of prolongation is not contrapuntal, but instead involves weak versions of the typical **T–(S)–D–T** progression. When such a progression fails to produce a proper cadence — that is, it ends with contrapuntal chords such as **D7–T1** or **D4–T3**, or uses a "deceptive resolution" **D5–T6** (**V–VI**) in place of the cadential **D5–T1** — the progression is called a *subsidiary harmonic progression* (this term comes from Edward Aldwell & Carl Schachter; Steven Laitz calls the same progression an *embedded phrase model*). It is "subsidiary" (or "embedded") because instead of occupying the whole phrase, it is subsidiary to (or embedded in) a larger progression.

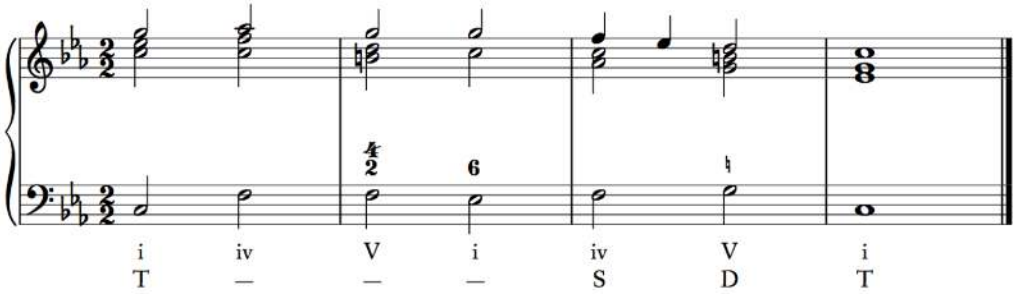
These subsidiary progressions *always prolong tonic*. They are labeled in an analysis by following the initial T with a line:

> ***T*———————**

For instance, consider the following possible harmonic progression for a phrase:



The first progression through the **T–S–D–T** cycle does not produce a cadence when it returns to T. However, it cannot be said to be a contrapuntal prolongation because it follows the normal functional cycle perfectly. Thus, it is a subsidiary progression.

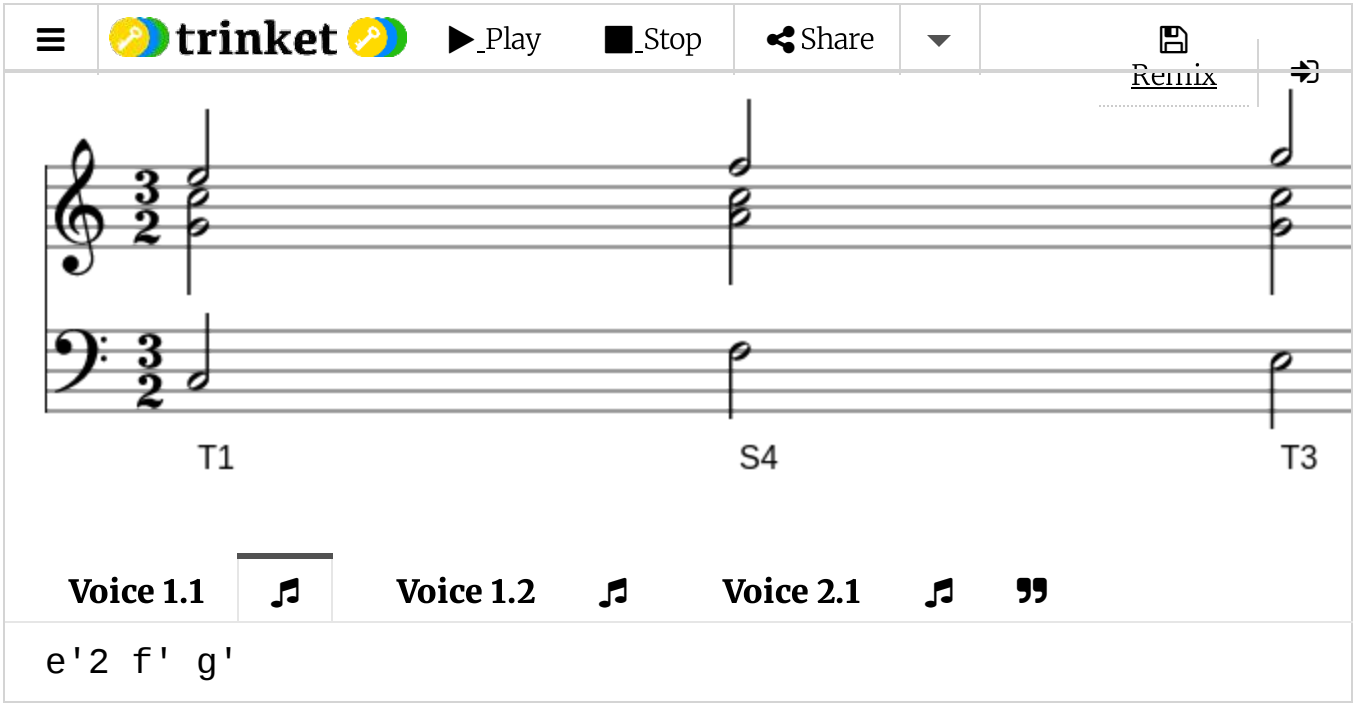


Plagal progressions

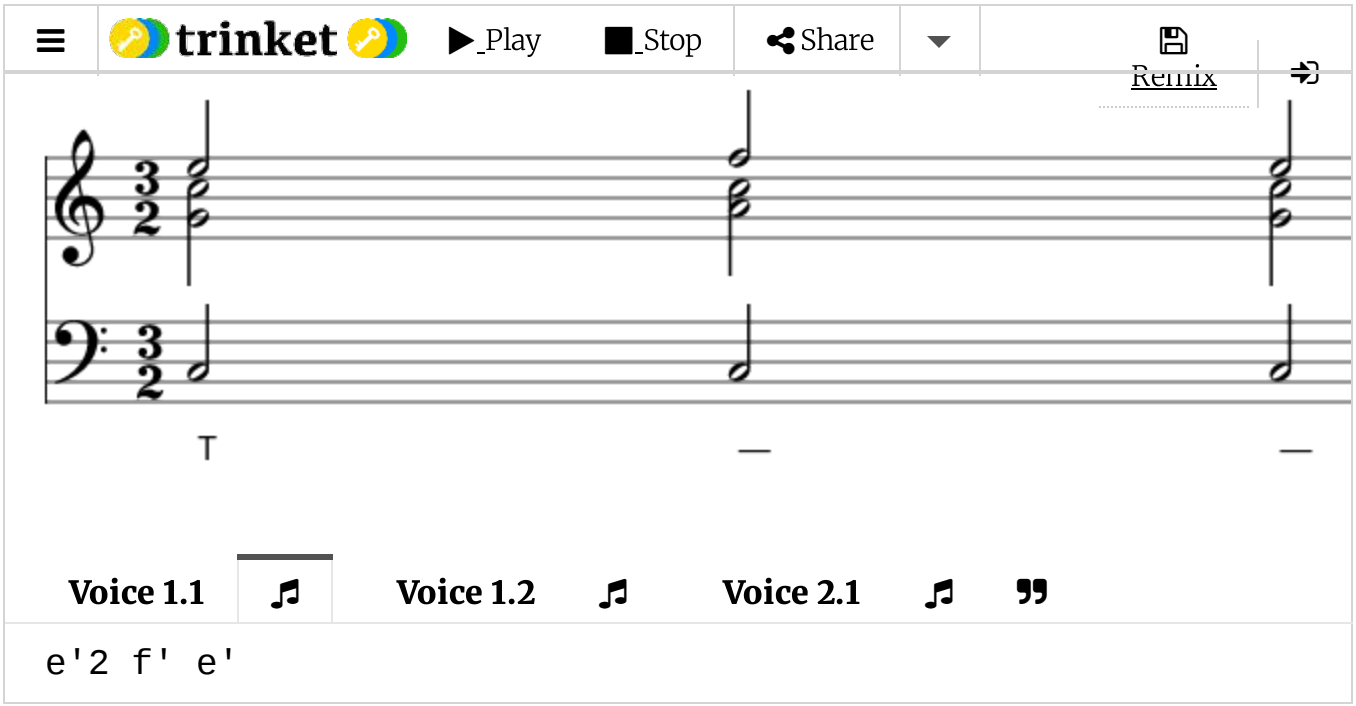
As a rule, **T** is used for contrapuntal prolongation of **S**, **S** prolongs **D**, and **D** prolongs **T**. However, there are some common patterns in which **S** is used to prolong **T**.

The *champagne progression* (**I–IV^6–I^6** or **I–IV^6–III**) is one. Another is the **S4** divider, as well as the related **S4** embellishing chord. All are described above.

One other common pattern is to use **IV** (**S**) as a complete or incomplete neighbor to **I^6** (**T**). Common progressions include **I IV I^6** and **I^6 IV I^6**.



Also common is a *change-of-figure* prolongation of **T1**: **I–IV$^{6/4}$–I**. The **IV$^{6/4}$** can be considered an **S** chord, but it is often more appropriate simply to consider the sixth and fourth above the bass in that chord to be neighbor tones to the fifth and third. Simply label such a progression **T———** underneath the Roman numerals.

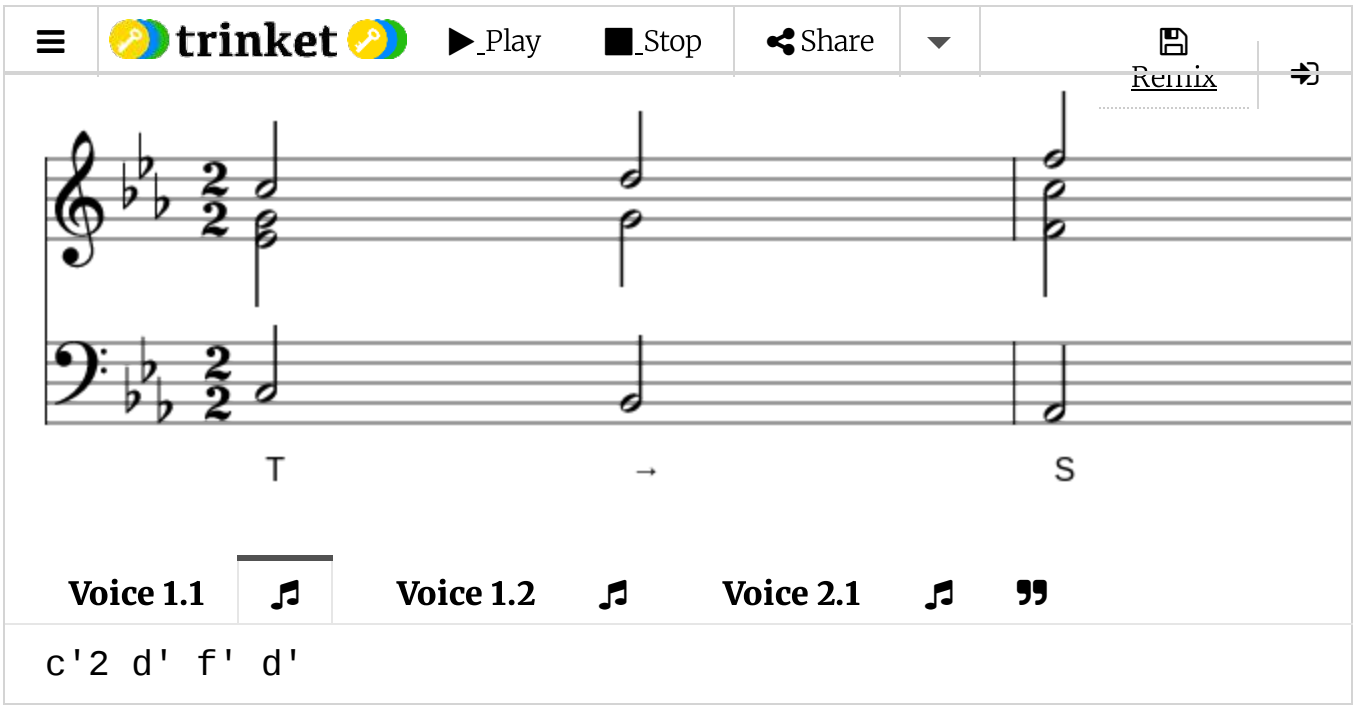


Prolonging a progression

Occasionally, a contrapuntal chord is used not to prolong a single function, but to connect chords of different functions — in other words, to prolong a progression.

The most common occurrence is when a bass line moves down by step from *do* to *sol*, which is especially common in minor. The bass line *do–te–le–sol* is harmonized by **T1 D7 S6 D5** (usually **i v^6 iv^6 V** — the chord qualities are important in this progression,

called the “lament”). In this progression, the **S6** is a functional subdominant leading to the cadential **D5**. The **D7** chord, then, is simply a passing chord that connects **T1** with **S6**. To notate this, draw and arrow between **T** and **S** underneath the Roman numeral analysis.



3.5: Performing a Harmonic Analysis

Analyzing harmony in a piece or passage of music involves more than labeling chords. Even the most basic analysis also involves *interpreting* the way that specific chords and progressions function within a broader context. Ultimately, no analysis is complete until individual musical elements are interpreted in light of the work as a whole and the historical setting in which the piece occurs. But this resource simply walks through the steps of performing a basic harmonic analysis, interpreting each chord and chord progression in light of the musical phrase in which it occurs.

The first step in a harmonic analysis is to *identify phrases*. For the most part, that means beginning by identifying *cadences*. However, not every type of phrase ends with a cadence, so sensitivity to theme types is important. In classical instrumental music, that means listening for period- and sentence-like structures. In classical or romantic music with text, that means listening in particular for the ends of poetic lines and melodic phrases.

Once you have identified the musical phrases, it can be helpful to perform a harmonic reduction (thoroughbass reduction, for example) for each phrase. Below the score/thoroughbass line, write the appropriate Roman numeral, **T/S/D** label for each chord, and/or an uninterpreted functional bass symbol for each chord (**T1 T3 S4** etc.). This handout can help you determine the functions of chords in the thoroughbass reduction.

Next identify the general harmonic structure of each phrase. Typical phrases in classical music will do one of the following:

- prolong tonic without a cadence (a classical *presentation* phrase, for example)
- progress toward an authentic cadence (ending with $\mathbf{V^{(7)}\ I}$, **D5 T1** in functional bass)
- progress toward a half cadence (ending with **V**, **D5** in functional bass)

If the phrase prolongs tonic (no cadence), label the *entire* phrase **T——.**

If the phrase ends with a cadence, identify the *cadential progression*. This includes the last chord of the tonic zone, optionally followed by a subdominant chord or zone (most often a single chord), and a required dominant zone (most often a single chord or compound cadence formula). Half-cadence phrases end there. Authentic-cadence phrases continue on to a final tonic zone (usually a single chord).

The the **(S) D T** of the cadential progression should be labeled as such. Once the cadential progression is identified, everything before it is labeled as tonic prolongation. Regardless of whether it is contrapuntal prolongation, a subsidiary progression, or a combination of the two, it will be labeled **T——.** (See Harmonic syntax – prolongation if those terms are unfamiliar to you.)

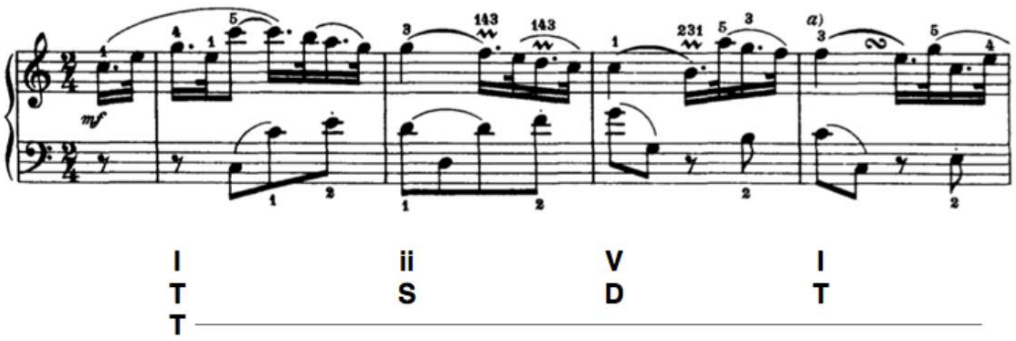
Thus a phrase ending with a half cadence will have a functional analysis that looks like:

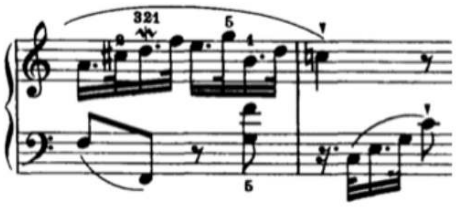
> *T————————— (S) D*

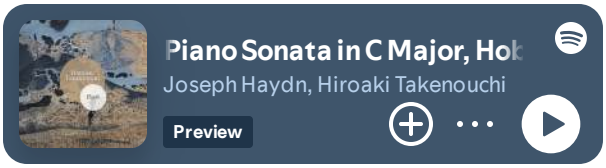
A phrase ending with an authentic cadence will have a functional analysis that looks like:

> *T————————— (S) D T*

Following is an excerpt from the opening of Haydn's Piano Sonata in C Major, Hob. HVI:21, I. Chords are labeled with Roman numerals and a **T/S/D** functional label for each chord. The tonic prolongation is shown below that with a T followed by a line for the duration of the tonic zone. The cadential progression is comprised of the last tonic chord (m. 4) through **S D T** to the **PAC** in m. 6.







3.6: Classical Cadence Types

A *cadence* is a point of arrival that punctuates the end of a musical unit, such as a phrase, theme, large formal section, or movement. A cadence is at once a harmonic, melodic, rhythmic, and formal event, but cadences tend to be grouped according to different ways in which harmony and melody articulate that point of arrival.

Authentic and half cadences

These unit-ending points of arrival are first grouped into *authentic cadences* and *half cadences*. An authentic cadence occurs when a formal unit ends with the progression **D5–T1** (**$V^{(7)}$–I**, *sol* to *do* in the bass voice). If the melody accompanying this harmonic progression arrives on *do*, it is called a *perfect authentic cadence*; it the melody ends on *mi* or *me* (or more rarely *sol*), it is called an *imperfect authentic cadence*.

Phrases that end on **V** without progressing to **I** are called *half cadences*. These cadences typically contain *re* in the melody, though *ti* and *sol* are also possible points of melodic arrival. The **V** is almost invariably a triad, rather than a seventh chord, and it is always in root position (**D5**).

Differentiating between *perfect authentic cadences* (PAC), *imperfect authentic cadences* (IAC), and *half cadences* (HC) by ear and with a score is essential both to formal analysis and model composition.

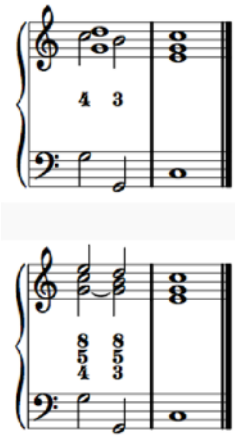
Simple, compound, and double cadences

Writers of Italian keyboard treatises like Furno and Fenaroli (and, more recently, American historical theorists like Robert O. Gjerdingen) differentiate cadences according to the voice-leading found over the dominant harmony. These distinctions do not replace the above PAC/IAC/HC distinctions; rather they add another level of detail that is particularly helpful in model composition. These voice-leading distinctions provide three more cadence categories to complement PAC, IAC, and HC: the *simple cadence*, the *compound cadence*, and the *double cadence*.

A *simple cadence* occurs when the dominant harmonic function is articulated by a single chord—either a triad or a seventh chord. The simple cadence can be used in a PAC, IAC, or HC construction, though the seventh-chord version is typically only found in authentic cadences.

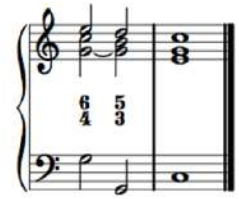
A *compound cadence* occurs when the bass note *sol* of the cadential dominant is repeated, often with the second *sol* an octave lower than the first. The compound cadence comes in three specific forms.

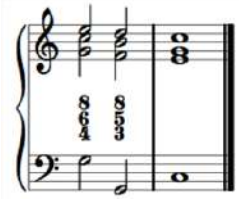
The first type of compound cadence involves a 4–3 suspension—*do* to *ti*—over the *sol* bass of the dominant harmony. In a four-voice texture, the other two voices sustain a fifth above the bass and an octave above the bass. The *thoroughbass* figure is typically the abbreviated 4–3, which stands for 8/5/4–8/5/3 in four voices. The 4–3 suspension can occur over the cadential dominant of a PAC, IAC, or HC.



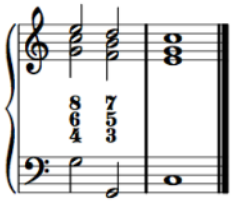
The second type of compound cadence adds a *mi/me* to *re* voice (6–5) to the above 4–3 suspension. In a four-voice texture, the bass is doubled. The typical thoroughbass figure is 6/4–5/3, leading to the common name for this progression, the *cadential six-four*.

The complete figure is 8/6/4–8/5/3. The cadential six-four can occur over the cadential dominant of a PAC, IAC, or HC.

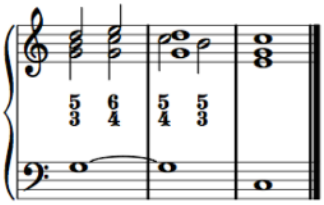




The last type of compound cadence is a special case of the cadential six-four, where the fourth voice introduces a seventh over the second dominant chord, rather than simply doubling the bass for both chords. This compound cadence type requires four voices and complete thoroughbass figures of 8/6/4–7/5/3. This figure rarely occurs over the dominant of a half cadence and is instead reserved primarily for authentic cadences.



A *double cadence* is a four-stage pattern over the cadential dominant used almost exclusively in perfect authentic cadences. Though it had expired from common use by the time of Mozart and Haydn, it was a staple for earlier *galant* composers and *Classical* treatises on composition and accompaniment. The four-stage pattern over the dominant is 5/3–6/4–5/4–5/3. In four voices, the bass is also doubled, or a seventh can be applied to any *chord of the fifth* (i.e., not the 6/4).



Voice-leading in strict keyboard style

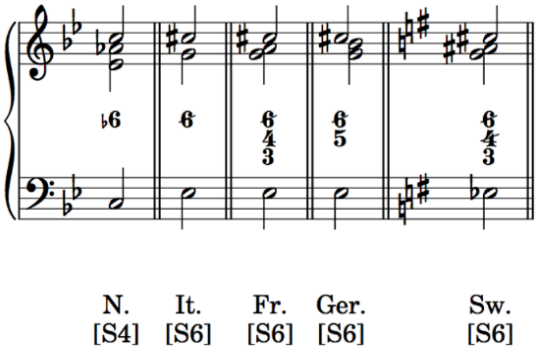
In strict melodic keyboard style, always end an idealized phrase with a perfect authentic cadence (PAC). Approach the melody's final *do* by step whenever possible, from *re* or *ti*, preferably from *re*. When using compound or double cadences, use the orientation of upper voices shown in the above figures (transposed to the appropriate key, of course).

In *basso continuo* style, the top voice can end with any member of the tonic triad. As much as possible, use the voices provided in the figures above, but invert them (move the tenor line to the top, making the melody and alto the alto and tenor, for example). Simply make sure that if *ti* occurs in the top voice before the final tonic chord, it resolves its tendency up to *do*.

In either case, pay special attention to the cadential six-four version of the compound cadence. Despite forming a consonant triad with the bass, both the sixth and the fourth of the first chord act like suspensions, and therefore *must resolve down by step* and be prepared smoothly (by common tones or steps). This is true no matter which part is in the melody, alto, or tenor.

3.7: Chromatically Altered Subdominant Chords

The most common chromatically altered subdominant chords (aside from the applied dominant of V) are the *Neapolitan chord* and the various *augmented-sixth chords*.



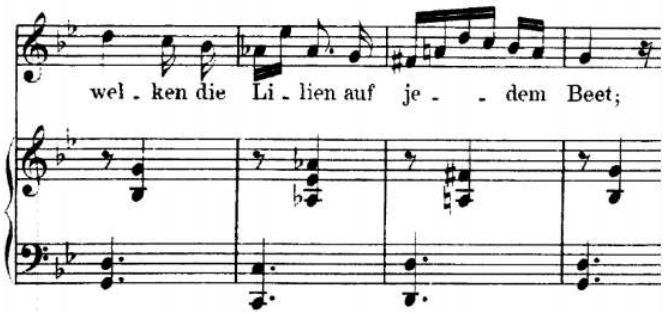
Neapolitan chord

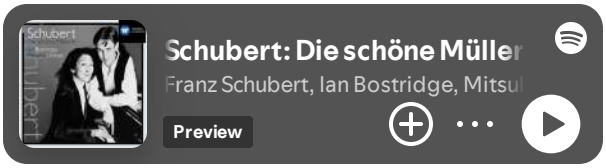
The Neapolitan chord contains lowered scale-degree 2, along with scale-degree 4, and lowered scale-degree 6: *ra*, *fa*, and *le*. It is a major triad, and it usually appears with *fa* in the bass (first-inversion), which is also doubled in a four-voice texture.

In a Roman numeral analysis, **N.** (or **N.^{6}**) substitutes for a Roman numeral (that is, it is not labeled a flat-II chord in classical music). As a chromatically altered subdominant chord, it always expresses subominant function (**S**).

In a functional bass analysis, **N.** is placed below the functional designation of **[S4]**.

Several prominent Neapolitan chords occur in "Der Müller und der Bach" from Schubert's song cycle, *Die schöne Müllerin* (song no. 19). On the score below (mm. 7–10 of the song), the tonic triad (G minor) is followed by a Neapolitan, then a dominant-seventh chord, and then tonic: T – S – D – T.





Augmented-sixth chords

Augmented-sixth chords are so named because of the augmented sixth that occurs between *le* and *fi*, two scale-degrees that are present in every augmented-sixth chord. The other pitch(es) in the chord determine which kind of augmented-sixth chord is present.

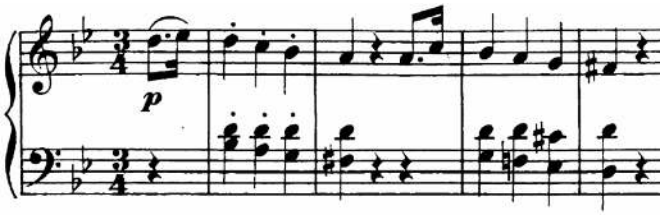
Italian augmented-sixth chord

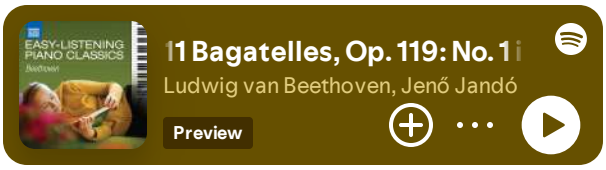
The *Italian augmented-sixth chord* is the simplest augmented-sixth chord, with only three members: *le*, *do*, and *fi*. *Le* is typically the bass note, and in a four-voice texture, *do* is typically the pitch that is doubled. (Keep in mind that you do not double the bass in a chord of the sixth, nor a chromatically altered tone such as *fi*. Thus, *do* remains as the only tone that can be doubled in strict style, and this doubling typically carries into freer styles, as well.)

In a Roman numeral analysis, **It.** replaces a Roman numeral. The figured bass is a simple slashed "6." It expresses subdominant function **S**).

When *le* occurs in the bass, the functional-bass designation is **[S6]**. Under that functional bass symbol, we also label the chord **It.**

The following example is from Beethoven's Bagatelle, Op. 119, No. 1, mm. 1–4. In m. 3, the Italian augmented-sixth chord falls on beat 3, immediately before the dominant chord.





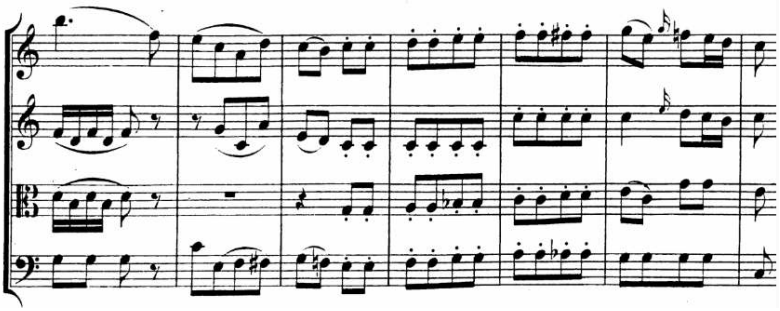
French augmented-sixth chord

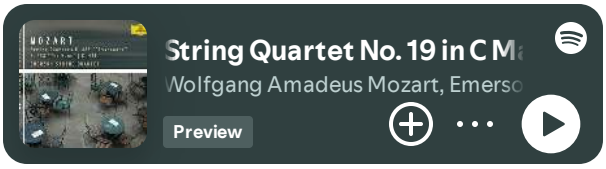
The *French augmented-sixth chord* has four members: *le*, *do*, *re*, and *fi*. As in the Italian sixth, *le* is typically the bass note.

In a Roman numeral analysis, **Fr.** replaces a Roman numeral. The figured bass is a slashed "6" with a "4" and a "3." It expresses subdominant function **S**).

When *le* occurs in the bass, the functional-bass designation is **[S6]**. Under that functional bass symbol, we also label the chord **Fr.**

The following example is from Mozart's String Quartet, "Dissonance," K. 465, iv., mm. 10–16. The French augmented-sixth chord occurs on beat 2 of m. 14. In this passage, a "milder" subdominant chord (**IV^6**) progresses to the more intense French sixth, which progresses into the cadential 6/4 before the final **V–I.**





German augmented-sixth chord

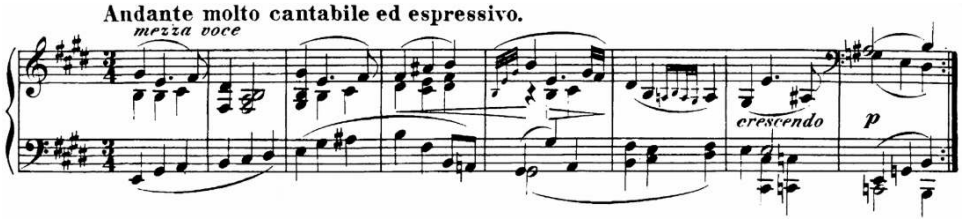
The *German augmented-sixth chord* has four members: *le*, *do*, *me*, and *fi*. As in the other augmented sixth chords, *le* is typically the bass note.

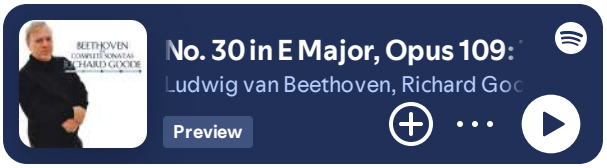
In a Roman numeral analysis, **Ger.** replaces a Roman numeral. The figured bass is a slashed "6" with a "5." It expresses subdominant function **S**).

When *le* occurs in the bass, the functional-bass designation is **[S6]**. Under that functional bass symbol, we also label the chord **Ger.**

The German sixth is almost always used in minor and followed by a cadential 6/4 chord, with *me* and *do* carrying over into the cadential 6/4.

In Beethoven's Piano Sonata in E Major, Op. 109, iii., a German augmented-sixth chord occurs on the last beat of m. 7 and carries over into m. 8 before releasing tension into the half cadence at the end of m. 8.





Swiss augmented-sixth chord

The *Swiss augmented-sixth chord* has four members: *le*, *do*, *ri*, and *fi*. This chord is named "Swiss" because it sounds German but is spelled like the French. (*ri* in place of *me*) (Switzerland has a mixture of German-, French-, Italian-, and Romansch-based languages, with German and French being the largest.) *Le* is typically the bass note.

In a Roman numeral analysis, **Sw.** replaces a Roman numeral. The figured bass is a slashed "6" with a slashed "4" and a "3." It expresses subdominant function **S**).

When *le* occurs in the bass, the functional-bass designation is **[S6]**. Under that functional bass symbol, we also label the chord **Sw.**

Like the German sixth, the Swiss augmented-sixth is almost always followed by a cadential 6/4 chord. However, the Swiss chord tends to appear in major keys, with *ri* proceeding to *mi* and *do* carrying over into the cadential 6/4.

3.8: Applied Chords

Tonicization is the process of momentarily emphasizing a non-tonic chord by using chords borrowed from the key in which that chord is tonic. Unlike *modulation*, there is no cadence in a new key, only a short progression of chords borrowed from another key.

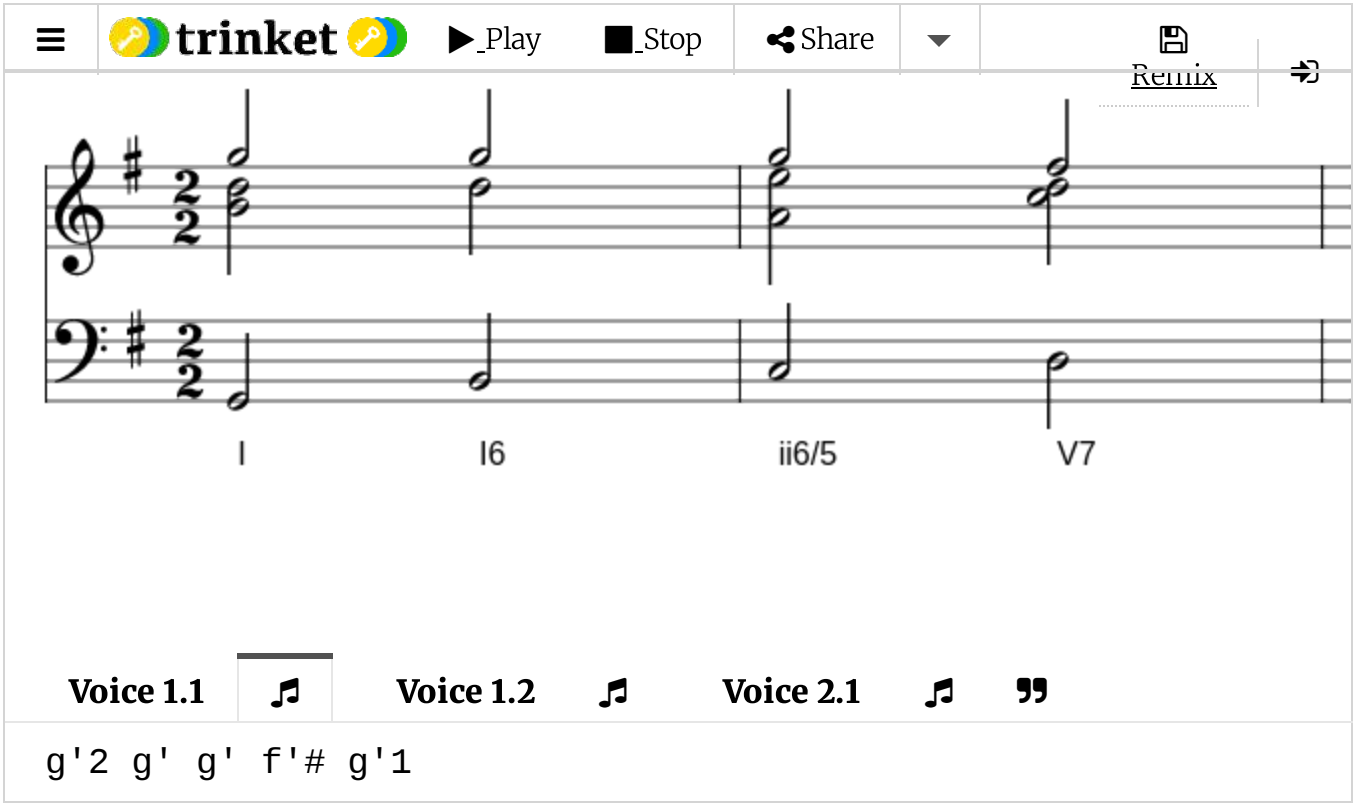
The chord that is tonicized is typically a chord that belongs to the present key. The chords that emphasize it are usually the chords borrowed from another key. And these chords are usually chromatic alterations of chords native to the present key.

The most straightforward example is when a subdominant chord is chromatically altered by changing *fa* to *fi*, and then progresses, like usual, to the dominant chord. This alteration of *fa* to *fi* turns a regular subdominant chord into a chord that has a dominant function in the "key of the dominant."

For example, take the chord progression **F–G–C** in C major. We would label this progression as **IV–V–I** with Roman numerals. If we change *fa* (F) to *fi* (F#) in the F chord, we get **F#dim–G–C**. In the key of C, we might analyze this progression as **#ivº V I**, noting the change in root and quality. However, we can also note that F#-dim is native to G major; it is a dominant-functioning chord (**viiº**) in the key of G—the key in which the following chord is tonic. In other words, we are borrowing the dominant chord from the key of G and *applying* it to the G-major triad. Thus, we can re-interpret the F#dim as an *applied dominant* of the G chord, which we label **viiº/V**—read "seven of five." Thus this progression is labeled **viiº/V V I**.

Note, however, that though we "borrowed" or "applied" a dominant chord from G major, that chord is acting in the context of C major. Its scale degrees are *fi*, *la*, and *do*: an alteration of scale degrees that clearly express subdominant function. Thus, in C major, the progression **F#dim–G–C** still expresses the functional progression **S–D–T**. (In functional bass—see below—this progression would be analyzed as **[S+4] D5 T1**.)

Exercise: change one note in the following excerpt to turn the subdominant chord into an applied chord. What Roman numeral and functional bass would you give that chord?



Such borrowing of chords can happen for *any major or minor triad in the home key*. Any diatonic triad can take an applied chord—a chromatically altered chord that also functions as a dominant chord in which the following chord is tonic. Thus, the example

progression of **F#dim–G** can occur in any key to which the G-major triad belongs: G major, C major, D major, B minor, A minor, or E minor.

Two things will always be true of the applied chord:

- The chromatically altered chord will function as a dominant chord in the key of the chord that follows it (**V** or **VII**).
- The chromatically altered chord will be an alteration of the function that logically precedes the function of the chord that follows it.

On the latter point, if the tonicized chord has tonic function in the current key (such as *mi–sol–ti* or *la–do–mi*), the applied chord will be an altered dominant of the current key. If the tonicized chord has dominant function in the current key, the applied chord will be an altered subdominant of the current key. If the tonicized chord has subdominant function in the current key, the applied chord will be an altered tonic of the current key.

APPLIED CHORD		TONICIZED CHORD
altered T	→	S
altered S	→	D
altered D	→	T

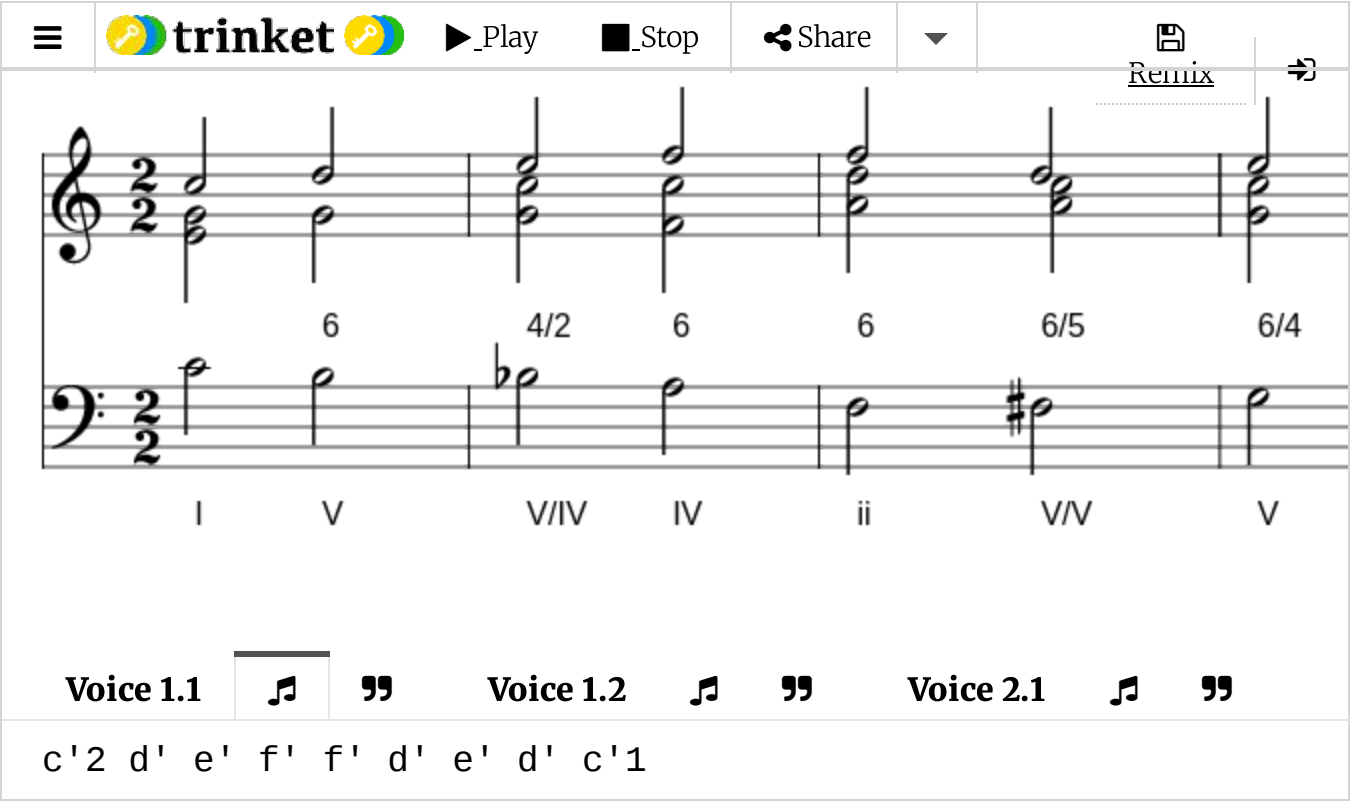
Analytical notation

Applied dominant chords will always make use of *slash notation*. Rather than **#IV**, **#V**, etc., in the Roman numerals, convention is to express its identity in the key that it is borrowed from. If in the key of E-flat, an F-dominant-seventh chord is used to tonicize a B-flat triad, we label the **F7** chord as $\mathbf{V^7/V}$, rather than $\mathbf{II^7}$. This goes on the same line as the Roman numerals for diatonic chords.

Underneath the slash notation, we label its harmonic function (**T**, **S**, or **D**). Here we show the way the chord is functioning in the *home* key, not the key from which it is borrowed. So while **F7** may be **V/V** in E-flat, it is a chromatically altered **S**, and so belongs in the **S** harmonic zone.

This distinction is important. Applied chords are employed within the context of a tonal phrase, and without a cadence in a new key (a modulation), these borrowed chords still play a role within the original key. So while we reflect their borrowedness via slash notation in the Roman numerals, it is also important to reflect their role in the broader harmonic context of the phrase by means of *non*-modulating functional labels.

Following is a short keyboard-style passage that includes two different applied chords, notated with Roman numerals.

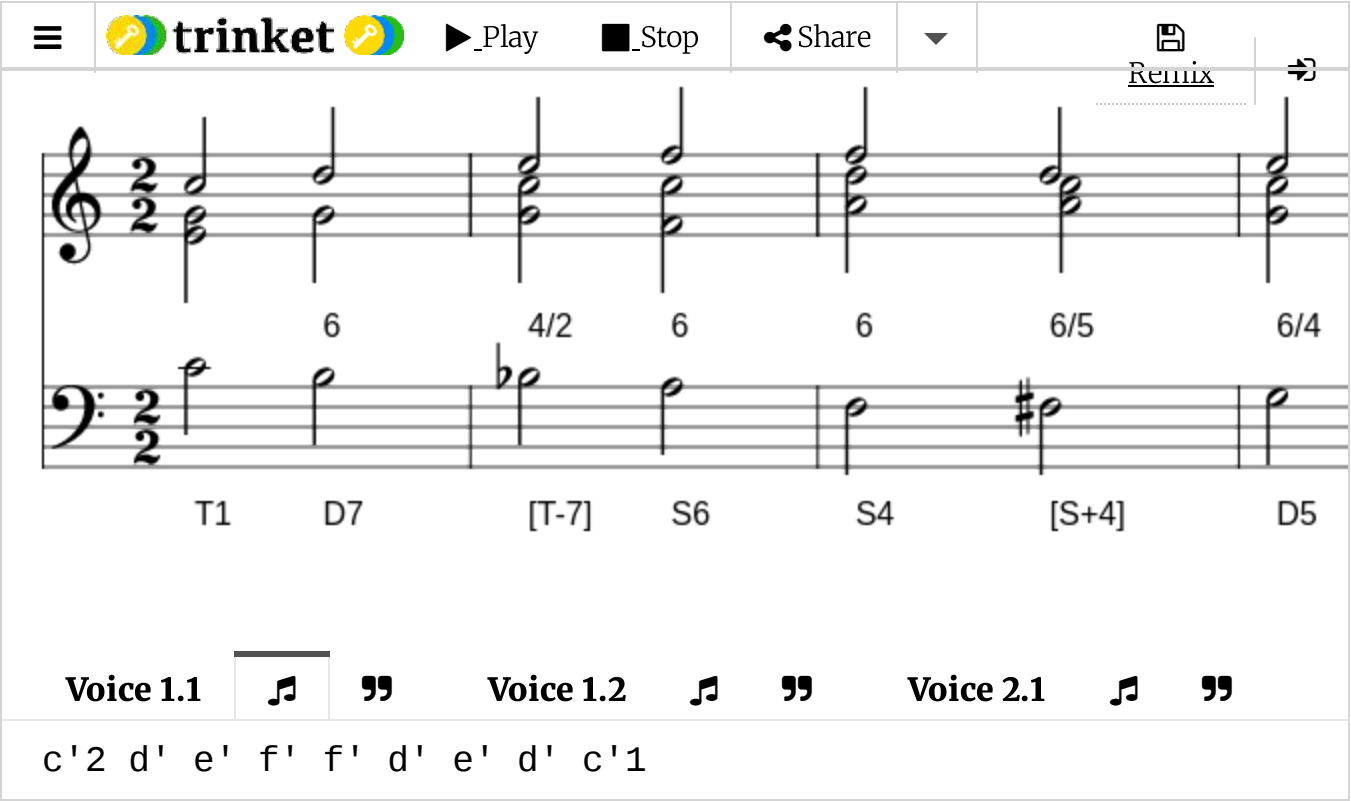


Notes on functional-bass notation

Like chromatically altered subdominant chords, every applied chord will have two elements to its functional bass symbol. First, on the normal line of functional bass analysis will be a symbol showing its function in the current key and the scale degree of the bass note (with "+" or "–" for altered bass pitches), surrounded by square brackets to signify that the chord is chromatically altered. (The square brackets are necessary no matter in which voice the chromatic alteration occurs.) Second, below the normal line of functional bass analysis will be a symbol denoting the key from which it is borrowed and the functional bass symbol the chord would have in that key.

In our above example of **F#dim–G–C** in the key of C, the regular functional bass line would read **[S+4] D5 T1**, and below the **[S+4]** would be the symbol **D7/V**. The latter symbol uses a slash to denote "in the key of" and a Roman numeral to denote the tonic of that key *relative to the current key*. We will use Roman numerals similarly when studying modulation to denote tonics of key areas to which the music modulates. Roman numerals, however, are *never* used to denote chordal roots in the context of a functional bass analysis.

Here is the same example above, but with the top layer of functional bass analysis replacing the Roman numerals. (Trinket only supports one layer of lyrics/harmonic analysis.) What chords would require a second layer of functional bass analysis? What would those symbols be?



(You can find the interpreted functional bass version here.)

Scale degrees in applied chords

Just as the various dominant functioning chords in a key will contain some combination of the dominant-functioning scale degrees —*sol*, *ti*/*te*, *re*, *fa*, and/or *la*/*le* (usually *le*)—each category of applied dominant chords will have their own set of usual scale degrees. They are as follows.

D/II — *di*, *mi*, *sol*, *la*, and *te*.
D/lowered-III (minor) — *re*, *fa*, *le*, and *te*.
D/III (major) — *ri*, *fi*, *la*, *ti*, and *do*.
D/IV — *mi*, *sol*, *te*, *do*, and *ra*.
D/V — *fi*, *la*, *do*, *re*, and *me*.
D/lowered-VI (minor) — *sol*, *te*, *ra*, and *me*.
D/VI (major) — *si*, *ti*, *re*, *mi*, and *fa*.
D/lowered-VII (minor) — *la*, *do*, *me*, and *fa*.

Functional dissonances in applied chords

Since tonicization temporarily borrows a chord from another key, and since that chord is made up of scale degress from that other key, an applied chord involves *borrowing scale-degree tendency from that other key*. In other words, in an applied chord, judge functional consonances (triggers and associates) and dissonances, as well as tendency tones like *ti*, relative to the key borrowed from, not the home key.

As a shortcut, that usually means the seventh of a seventh chord or the fifth of a diminished chord are functional dissonances. (In a half- or fully-diminished-seventh chord, both the fifth and seventh tend to be functional dissonances.) Also as a shortcut, the chromatically raised tone tends to be the leading-tone of the tonicized key.

In functional bass, use the functional label before the slash and the Roman numeral after the slash to determine functional dissonances more reliably. Consider a **D5/V** (altered **S2**) chord in G major. In the home key, the chord contains *re* (A), *fi* (C-sharp),

la (E), and *do* (G). But those pitches are *sol*, *ti*, *re*, and *fa* in the key of V (D major). Thus, the C-sharp should be treated like a leading-tone, and the G (*fa* in D) like a functional dissonance of dominant function.

Exercise: In the examples above, find the functional dissonance in each applied chord. What pitch is it? How does it progress into the next chord?

Exercise: on the bullet list above, determine which solfège syllable(s) are the functional dissonance for each applied chord.

3.9: Modal Mixture

Modal mixture (also called *modal borrowing*) refers to the use of chords belonging to a parallel key—for example, a passage in F major incorporating one or more chords from F minor. Note that, like with the use of applied chords, this does not necessarily constitute modulation. Only a cadence can confirm a new key. Without a cadence in a new key, the non-diatonic chords are simply "borrowed."

Note that the use of the leading-tone in place of the subtonic, or a melodic-minor figure (*sol–la–ti–do*) in a minor key does *not* constitute modal mixture. Those are considered "native" to the minor mode.

Roman numeral notation

When the root of a borrowed chord belongs to the home key (e.g., using an E-minor chord instead of an E-major chord), the Roman numeral remains the same, since the Roman numeral simply represents the scale-degree of the chordal root. If chord quality is reflected in the Roman numeral, then adjustments must be made to ensure that the borrowed chord's quality is reflected. For example, if a piece in minor ends with a *Picardy third* (a major tonic triad), the Roman numeral is **I** instead of **i**. (The thoroughbass will also be altered to reflect the chromatic change.)

If the root is altered relative to the home key, use a flat or sharp in front of the Roman numeral to designate the alteration: flat to designate *lowered* (that is, a semitone below normal), sharp to designate *raised* (a semitone above normal). For example, a *le–do–me* chord in a major key is **♭VI**. (Again, alter the thoroughbass as necessary.)

Functional bass notation

Chords borrowed from parallel keys are chromatically altered chords, and therefore their functional bass symbols should be enclosed in square brackets. For example, if an **S4** chord in major is borrowed from the parallel minor (*fa–le–do* instead of *fa–la–do*), the functional bass symbol is **[S4]** not **S4**. If the bass note is not altered, this is the only change to the functional bass (but be sure to alter the thoroughbass figure as well).

If the bass note is chromatically altered, that must be reflected in the functional bass with a plus or minus before the numeral (as well as the square brackets). For example, if a passage in a major key incorporates a 5/3 chord over *le* (*le–do–me* instead of *la–do–mi*), the functional bass is **[Tx–6]**.

3.10: Modulation

Tonicization occurs when a chord or short succession of chords are borrowed from another key in order to emphasize—or *tonicize*—a chord in the home key. (See analyzing applied chords.) *Modulation* occurs when a longer succession of chords emphasizes a new tonic, leading to the perception of a new key. The principal difference between tonicization and modulation is the presence or absence of a cadence: tonicization does *not* incorporate a cadence in the tonicized key; modulation *does* incorporate at least one cadence (PAC, IAC, or HC) in a new key.

There are several ways in which a composer can effect a modulation. The most common are described below.

Direct/phrase modulation

A *direct modulation* occurs when a chord in the previous key is followed directly by a chord in the new key. In other words, there is no smooth transition or overlap between keys, just a direct movement from one key to the next. This often happens at phrase boundaries, with the old-key tonic ending one phrase and the new-key tonic beginning the next. When a direct modulation happens across a phrase boundary, it is also called a *phrase modulation*.

Examples of phrase modulations abound at the point between the end of the exposition in a minuet or a sonata and the beginning of the repeat of the exposition (if an exposition repeat is present).

A direct modulation is noted in a harmonic analysis by following the last chord in the old key with the new key, followed by a colon, and then the first chord in the new key.

> *G: I II V I Am: I . . .*

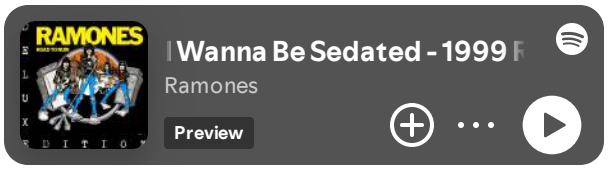
or

> *G: T1 S4 D5 T1 Am: T1 . . .*

Step-up/pump-up modulation

In the pop literature, direct modulations by whole- or half-step are common near the end of the song. Direct/phrase modulations by step from old-key tonic to new-key tonic in pop music are also called *step-up* or *pump-up modulations*. A step-up modulation is notated like a direct modulation.

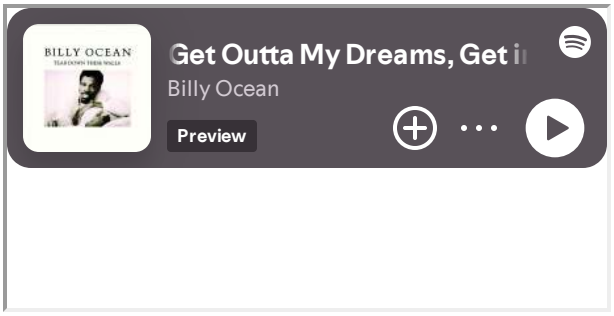
“I Wanna Be Sedated” by the Ramones includes an obvious *step-up* modulation (1:10).



Truck-driver modulation

A *truck-driver* modulation is a direct modulation that moves from the old key (usually the tonic chord) to the dominant chord of the new key to prepare that tonic arrival, again common in pop music. The idea behind the name (coined by Walter Everett) is that the music loses energy briefly while in “neutral” (the new key dominant) before moving to a higher state of energy (the new-key tonic, a step above the old-key tonic). A truck-driver modulation is notated like a direct modulation.

Billy Ocean’s “Get Outta My Dreams” contains a classic truck-driver modulation (3:55).

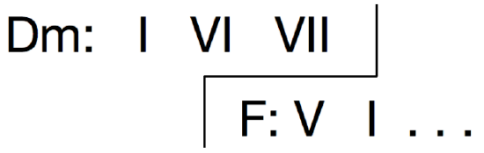


Pivot-chord modulation

A *pivot-chord* modulation makes use of at least one chord that is native to both the old key and the new key. It is the most common type of modulation in common-practice tonal music. The smoothest type of pivot-chord modulation uses a pivot-chord that expresses the same function in both keys — commonly subdominant function, but other functional arrangements are possible and commonly used.

When a chord expresses dominant function in the new key and is an applied chord in the old key, it is not a pivot chord. Instead, that chord is effecting a direct or truck-driver modulation. A pivot chord must belong to the diatonic collection of both keys (keeping in mind that in minor, both *la* and *le*, and both *ti* and *te* are "native" to the minor key).

A pivot-chord modulation is notated in a special way. The pivot chord receives its analytical symbol for the old key, as usual. Below that symbol is the new key, colon, and the analytical symbol for the pivot chord in the new key. When using notation software, a two-layered analysis is fine: use the lyrics tool to create multiple "verses" of harmonic analysis, one for each key, overlapping on the pivot chord. When analyzing by hand, use a bracket like the one shown in the following example.



3.11: Handouts and Charts

Lead-sheet and figured-bass symbols.

Harmonies (Roman numerals and functional bass) by bass scale degree.

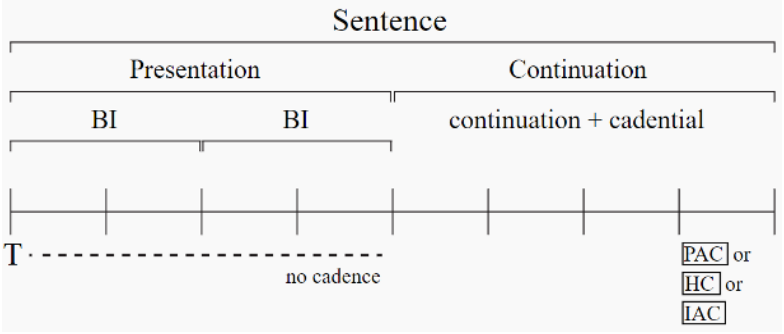
CHAPTER OVERVIEW

4: Form (I) - Thematic Structure in the Classical Style

4.1: Classical Theme Types - The Sentence
4.2: Classical Theme Types - The Period
4.3: Classical Theme Types - Hybrid Themes
4.4: Classical Theme Types - Compound Period
4.5: Classical Theme Types - Compound Sentence
4.6: Classical Theme Types - The Small Ternary
4.7: Classical Theme Types - The Small Binary
4.8: Classical Theme Types - Reference
4.9: Classical Theme Types - Thematic Function Reference
4.10: Techniques of Phrase Rhythm - External Expansions
4.11: Techniques of Phrase Rhythm - Internal Expansions

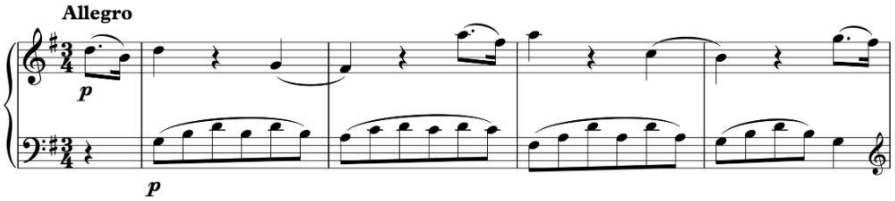
4.1: Classical Theme Types - The Sentence

The prototypical sentence is eight measures long and contains two four-measure phrases. The first of these is called the *presentation phrase* and the second is the *continuation phrase*.



Presentation phrase (mm. 1–4)

The presentation phrase begins the sentence and has two primary components, one melodic and the other harmonic. Melodically, it contains two repeated *basic ideas* (BI). Harmonically, it prolongs the tonic, by means of either a subsidiary harmonic progression or contrapuntal chords.



PRESENTATION: MOZART, K. 283, I., MM. 1–4

Here, the basic idea begins with the pickup to m. 1 and ends with the F-sharp on the downbeat of m. 2. It's then repeated. Though a basic idea is often exactly repeated, this example shows that it need not be. Rather, a basic idea is defined more abstractly by its rhythm and melodic contour, and thus, varied repetitions like this are possible.

Harmonically, these four measures prolong tonic. Measures two and three are contrapuntal chords that are surrounded by the tonic:

> ***I V4/3 V6/5 I***
> *or*
> ***T(1 D(2 7)n 1)***

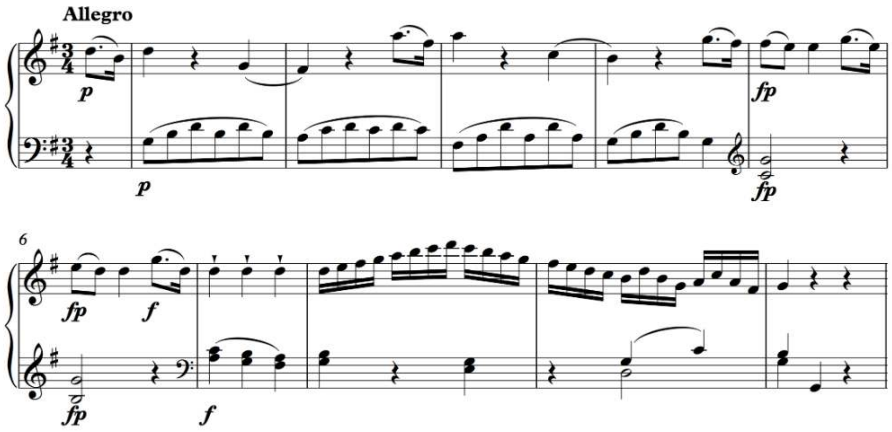
Altogether, the two expressions of the basic idea and the tonic prolongation in this phrase exhibit *presentation function*. Hence, the name "presentation phrase."

Continuation phrase (mm. 5–10)

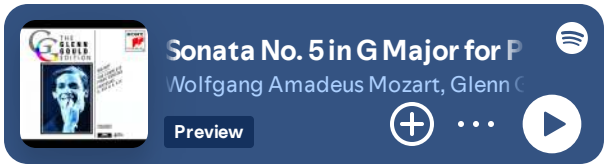
Continuation phrases acquire momentum and lead to the cadence that ends the sentence. Three types of cadence typically end a sentence: PAC, IAC, or HC.

Continuation phrases begin with *continuation function*, which has one or more (but not necessarily all) of the following five characteristics.

- Fragmentation: a breakdown in the size of melodic units
- Liquidation: removal of "characteristic" melodic figures
- Sequential repetition
- Accelerated surface rhythm
- Accelerated harmonic rhythm



PRESENTATION + CONTINUATION: MOZART, K. 283, I, MM. 1–10



This example exhibits all five characteristics. The basic idea creates a normative unit that is two measures in length. Beginning with the pickup to m. 5, that normative size is *fragmented* into one-measure units whose second half is *sequenced* one step lower. At m. 7 *increased surface rhythm* is matched with an *acceleration of harmonic rhythm* as the pianist's sixteenth notes occur above a hemiola in the pianist's left hand.

Sentences always end with cadential progressions that support *cadential function*. In this passage, while mm. 5–8 prolonged tonic by means of contrapuntal chords, mm. 8–10 employ a typical cadential progression:

> ***I IV6 Cad.6/4 V7 I***
> *or*
> ***T1 S6 D5 — T1***

And while mm. 5–8 employed fragments of the basic idea (the "characteristic" elements of the melody), mm. 8–10 *liquidates* those into elements unrelated to the basic idea (the "conventional" elements—scales and arpeggios, ending with a descending contour).

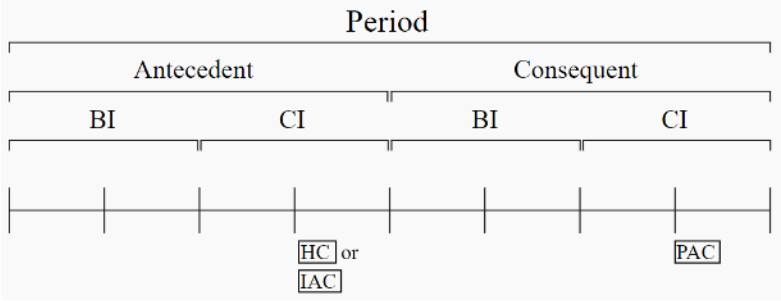
Phrase length

Note the length of the phrases in this example: a four-bar presentation phrase is followed by a *six-bar* continuation phrase. The prototypical phrase is four measures, but this is commonly expanded or even compressed by composers. In the sentence, continuation phrases are more likely to undergo expansions or contractions than are presentation phrases.

4.2: Classical Theme Types - The Period

A period is one type of theme, like the sentence, common to the Classical style.

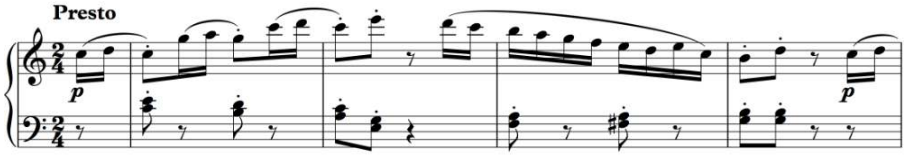
The period is generally eight measures long and contains two four-measure phrases, called *antecedent* and *consequent*.



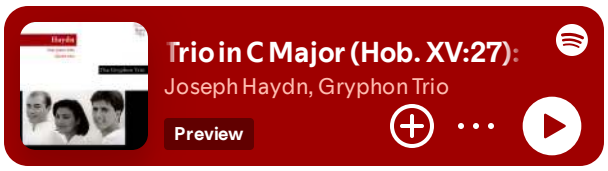
The period is characterized by balance and symmetry. Its antecedent phrase is initiated by a basic idea that recurs at the beginning of the consequent phrase. Unlike the sentence, which exhibits a single cadence, the period contains *two cadences*, a weak one to end the *antecedent* and a strong one to end the *consequent*.

Antecedent phrase (mm. 1–4)

Unlike the sentence, which contains a basic idea followed by a repetition, the two measure basic idea that begins the a period's antecedent is always followed by a two-measure *contrasting idea* (CI). That contrasting idea supports a cadential progression that ends the antecedent with a weak cadence, either a HC or an IAC.



ANTECEDENT: HAYDN, PIANO TRIO IN C MAJOR, HOB. XV:27, III, MM. 1-4



Note the contrast created between the basic idea and contrasting idea. While the BI ascends, outlining the tonic triad with leaps to each of its members, the CI descends stepwise leading to a weak I:HC. The emphasis on tonic in the melody of the BI is accompanied by a tonic prolongation in the harmony (a variant of the *Romanesca* schema):

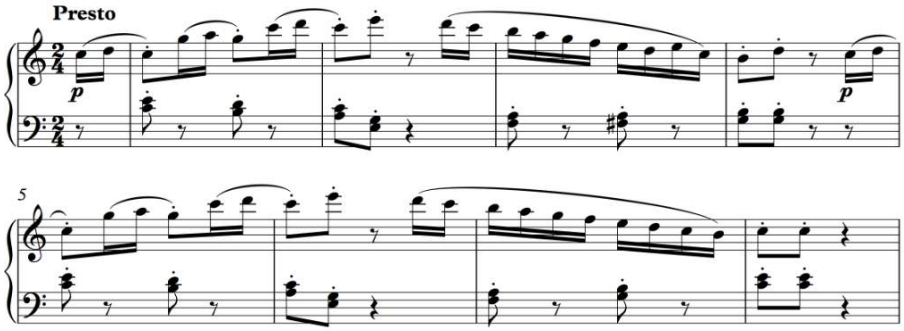
> ***I V6 VI III***
> *or*
> ***T(1 D7p x6 3)***

Supporting the CI is an expanded cadential progression:

> ***III IV $V^{6/5}$/V V***
> *or*
> ***T3 S(4 [+]) D5***

Consequent phrase (mm. 5–8)

Consequent phrases always begin with a restatement of the BI, occasionally varied, and end with a CI. A consequent phrase's CI often resembles the antecedent's, but slightly altered to accommodate a stronger cadence. It is also common for a consequent phrase's CI to be entirely new. While a sentence can close with a number of cadence types, the period's consequent phrase always ends with a PAC:



ANTECEDENT + CONSEQUENT: HAYDN, PIANO TRIO IN C MAJOR, HOB. XV:27, III, MM. 1-8

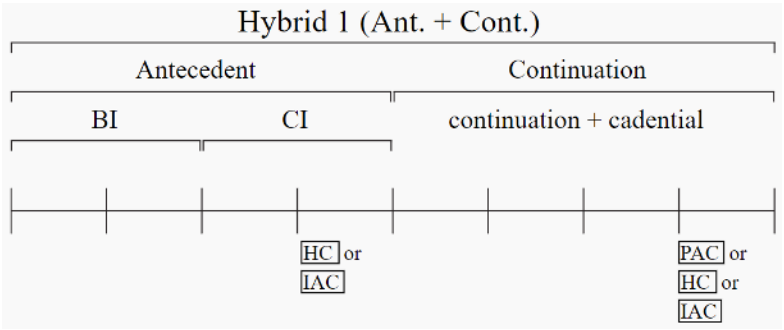
In this example, the BI is restated exactly at the beginning of the consequent. The concluding CI is a slight variation of the end of the antecedent, altered here to create a PAC.

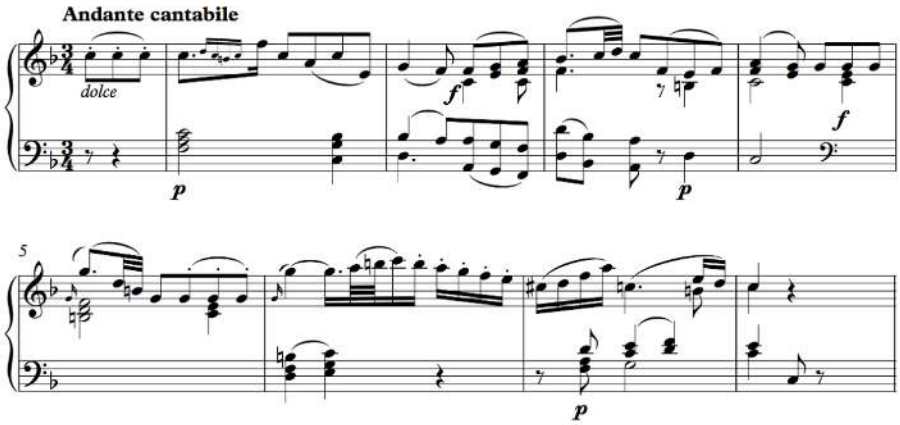
4.3: Classical Theme Types - Hybrid Themes

Hybrid themes mixes the functional features of sentences and periods. William Caplin has identified four primary types:

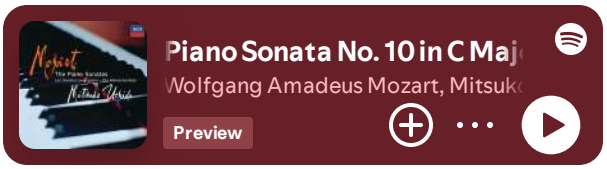
Hybrid 1

Hybrid 1 combines an antecedent phrase with a continuation phrase.





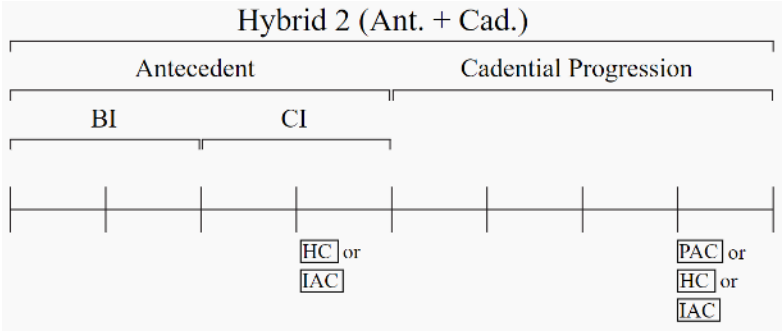
ANTECEDENT + CONTINUATION: MOZART, PIANO SONATA IN C MAJOR, K. 330 II, MM. 1–8

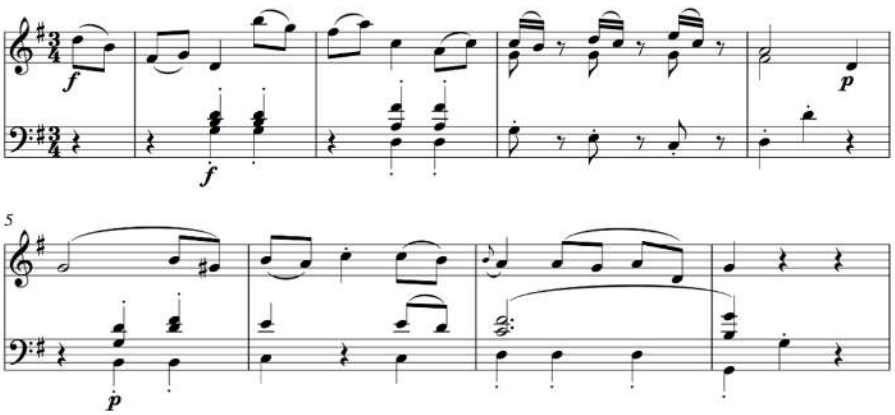


A prototypical example is found in the first eight measures of Mozart's Piano Sonata in C major, II. The antecedent phrase contains a basic idea characterized by the repeated notes forming its anacrusis. This is followed by a contrasting idea formed from a scalar ascent leading to the phrase's half cadence in m. 4. Following the antecedent phrase, the music begins to express continuation function, primarily through fragmentation and an increase in surface rhythm. In the middle of m. 6, the characteristic melodic motives are liquidated into conventional scalar figuration leading to a V:PAC.

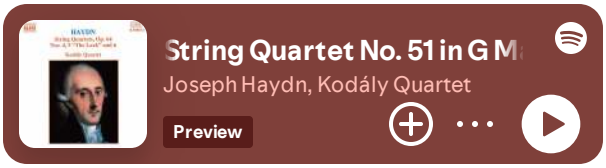
Hybrid 2

Hybrid 2 combines an antecedent phrase with a four-measure cadential progression.





ANTECEDENT + CADENTIAL: HAYDN, STRING QUARTET IN G MAJOR, HOB. III:66, II, MM. 1–8



Here, the four measures subsequent to the antecedent support a single cadential progression:

> ***I6 ii6/5 V I***

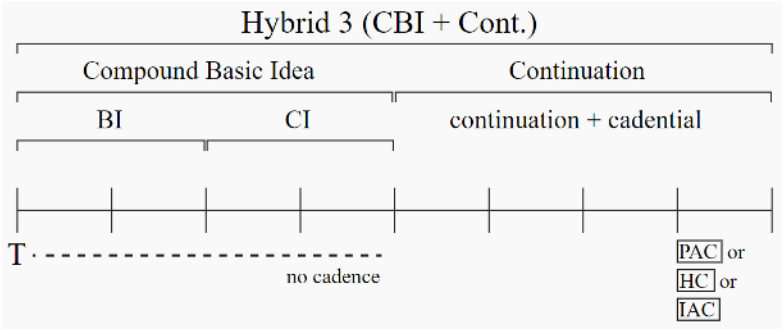
Notice that this four-measure phrase does not display any markers of continuation function.

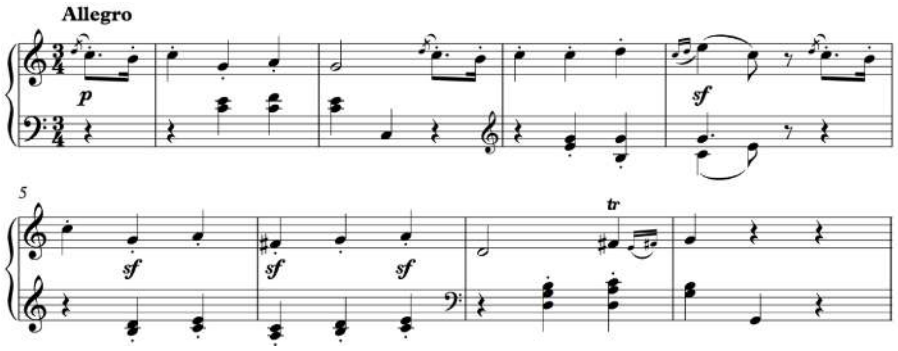
##The Compound Basic Idea

Just as we sometimes find composers combining different features of the two primary thematic types, we also often find combinations of different types of phrase. The "compound basic idea," or CBI, combines the melodic characteristics of the antecedent function with the harmonic characteristics of the presentation function. Like an antecedent, it presents a basic idea followed by a contrasting one. But like a presentation, the compound basic idea simply prolongs tonic, without ending in a cadence.

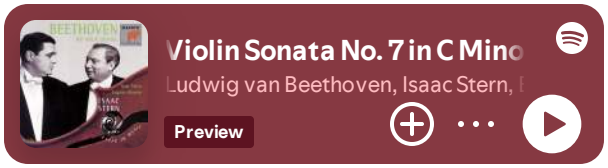
Hybrid 3

The third hybrid type strongly resembles the first hybrid. Rather than beginning with an initiating antecedent, however, its first phrase is a CBI. Following the CBI, Hybrid 3 concludes with a continuation that ends with a cadence.





COMPOUND BASIC IDEA + CONTINUATION: BEETHOVEN, VIOLIN SONATA, OP. 30, NO. 2, III, MM. 1–8

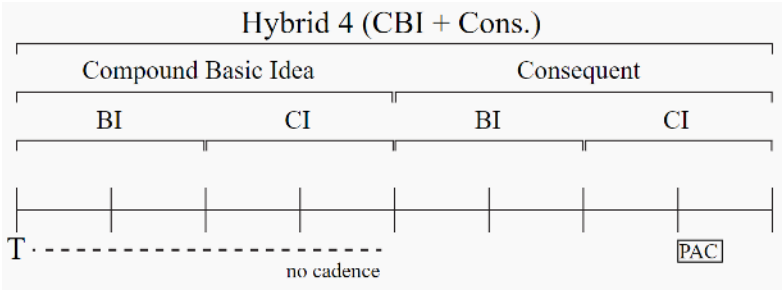


In this example, from Beethoven's Violin Sonata, Op. 30, the melodic structure of the initiating phrase contains two contrasting ideas, each of which begins with the same dotted figure. However, unlike a typical antecedent, the phrase only prolongs tonic as the V6 on the last beat of m. 3 only decorates the tonic through a lower neighbor motion rather than creating cadential articulation. Thus, the phrase is best understood as a "compound basic idea."

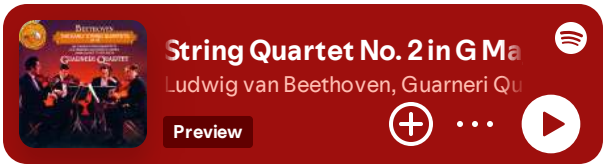
The concluding phrase is a typical continuation expressed through fragmentation, melodic sequence, and increased harmonic rhythm.

Hybrid 4

Hybrid 4 resembles the period, with the exception that the first phrase is comprised of a "compound basic idea" rather than an antecedent. Following the CBI, the concluding phrase expresses the function of a consequent, typically altering the return of the contrasting idea so that the theme ends with a strong cadence.



COMPOUND BASIC IDEA + CONSEQUENT: BEETHOVEN, STRING QUARTET IN G MAJOR, OP. 18/2, IV., MM. 1–8



The cello's presentation of the initiating phrase contains two distinct melodic ideas. But this phrase's conclusion, on the C4 in m. 4, is not sufficient to create cadential closure. When the remaining strings enter in m. 5, they work through the same basic and contrasting ideas, but are able to create a I:PAC to close the consequent phrase.

4.4: Classical Theme Types - Compound Period

The compound period (also called the *16-bar period* because its typical form is 16 bars long) is made of *two themes* instead of *two phrases*. Like an 8-bar period, the two halves of the compound period exhibit antecedent and consequent function. To distinguish them, we will call these “large antecedents” and “large consequents.”

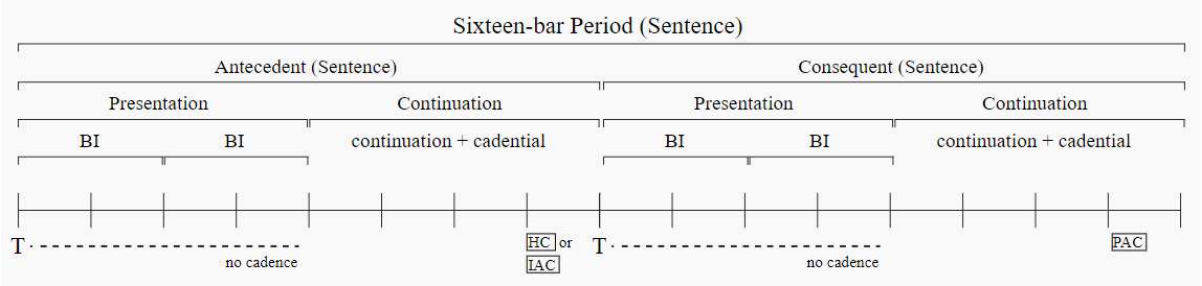
The thematic types available to the two halves of the compound period must be conducive to the functions of antecedent and consequent. Thus,

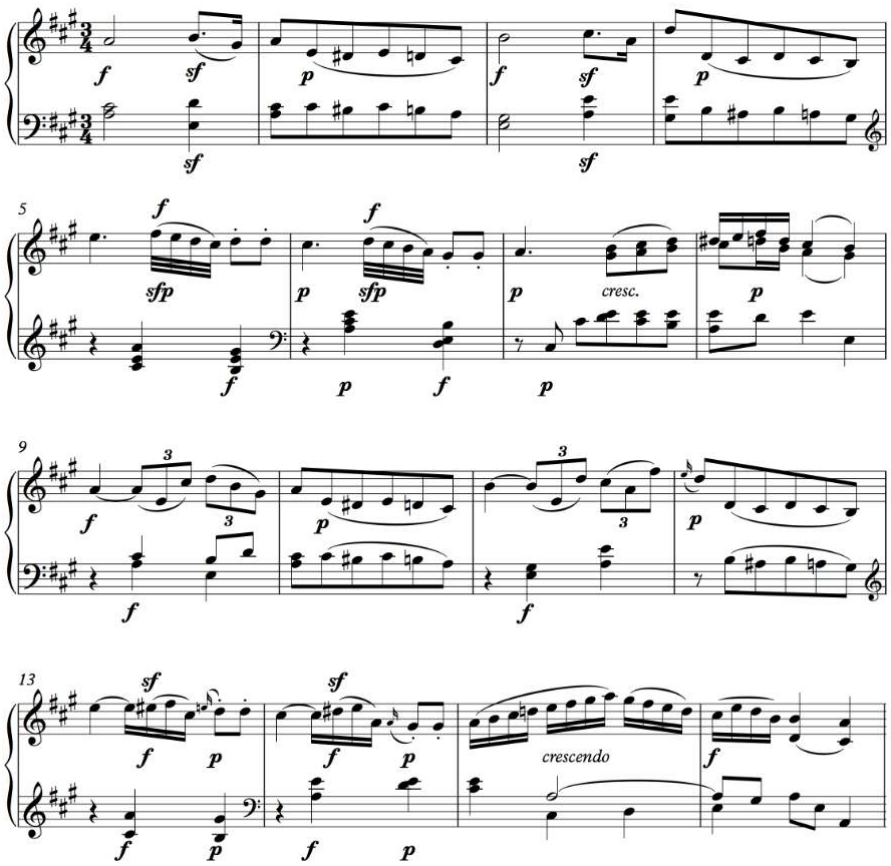
- the initiating phrase of the *large antecedent*, usually four bars long, will act as a basic idea - either presentation, antecedent, or compound basic idea;
- the concluding half, also typically four bars long, will act as a contrasting idea and will always be a continuation;
- the *large consequent* should return the BI from the first theme (often varied), and its concluding CI will end with a strong cadence.

These functional requirements tend to result in three types of compound period.

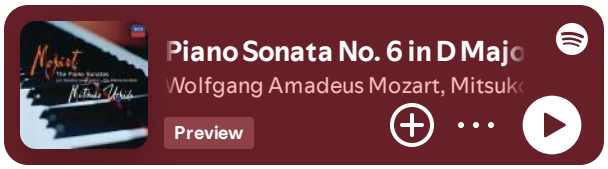
A Compound Period Comprised of Two Sentences

Both sentences in the compound period will have the same basic idea, each exhibiting presentation function. In the first sentence, the presentation is followed by a continuation that ends with a weak cadence. In the second, the continuation culminates in a strong cadence, most commonly a PAC.





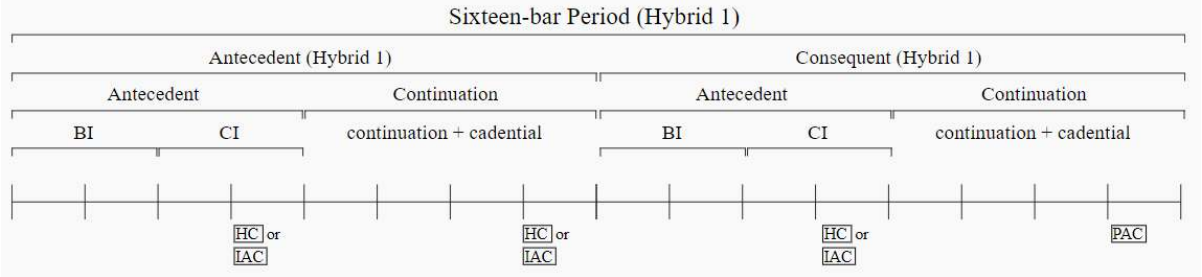
COMPOUND PERIOD (SENT. + SENT.): MOZART, PIANO SONATA IN D MAJOR, K. 284, II, MM. 1–8

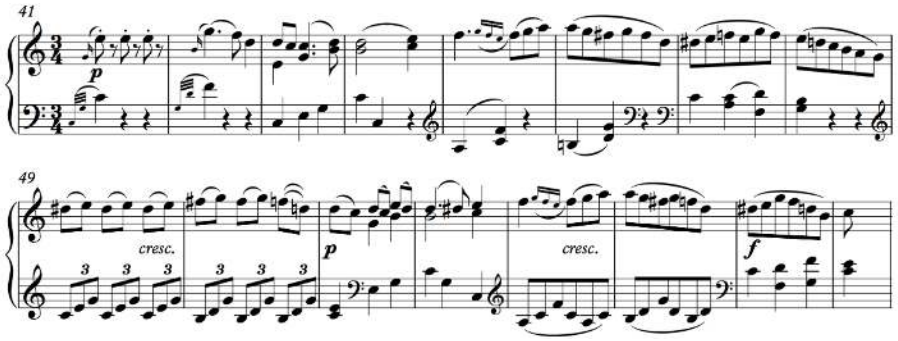


The large antecedent is constructed as a sentence whose basic idea is a presentation and whose contrasting idea is a continuation. Following the HC in m. 8, the next phrase restates the presentational basic idea in varied form. The final four measures culminate in a PAC.

A Compound Period Comprised of Two Hybrids

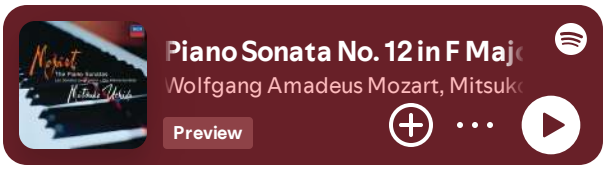
If the initiating phrase is composed of an antecedent, rather than a presentation, the 8-bar antecedent phrase will be a hybrid of the "antecedent + continuation" variety.



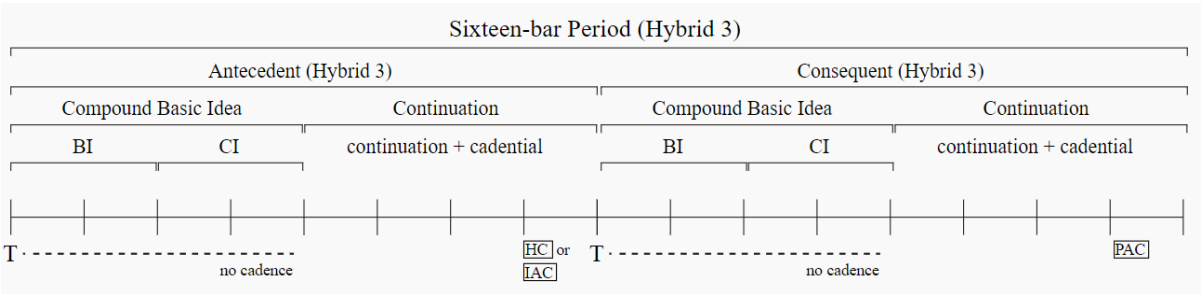


COMPOUND PERIOD (HYBRID 1 + HYBRID 1): MOZART, PIANO SONATA IN F MAJOR, K. 332, I, MM. 41–56

In this example the large antecedent begins with a small antecedent, comprising mm. 41-44, that acts as a basic idea. In the large consequent, this basic idea returns (mm. 49-52) in varied form.



By contrast, if the initiating phrase is composed of a "compound basic idea", the large antecedent will be a type-3 hybrid: compound basic idea + continuation. This type of compound period is *very similar* to the previous variety. The only distinction is that the initiating phrase will not culminate in a cadence, thus giving the theme's initiation a looser quality.

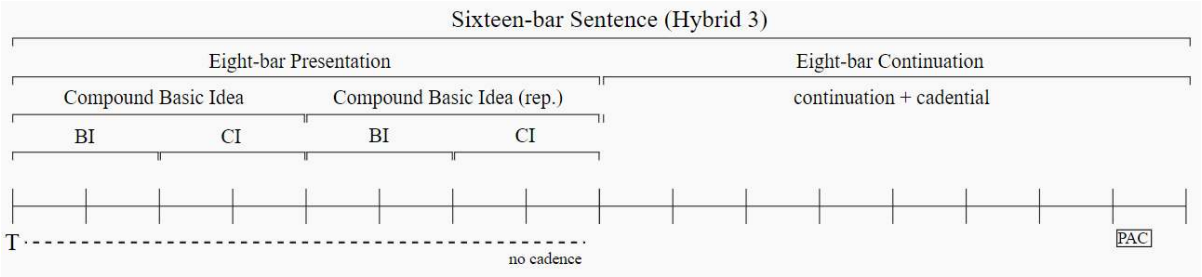


4.5: Classical Theme Types - Compound Sentence

The compound (or 16-bar) sentence expands both the presentation and continuation phrases of a regular sentence to a length of eight bars each.

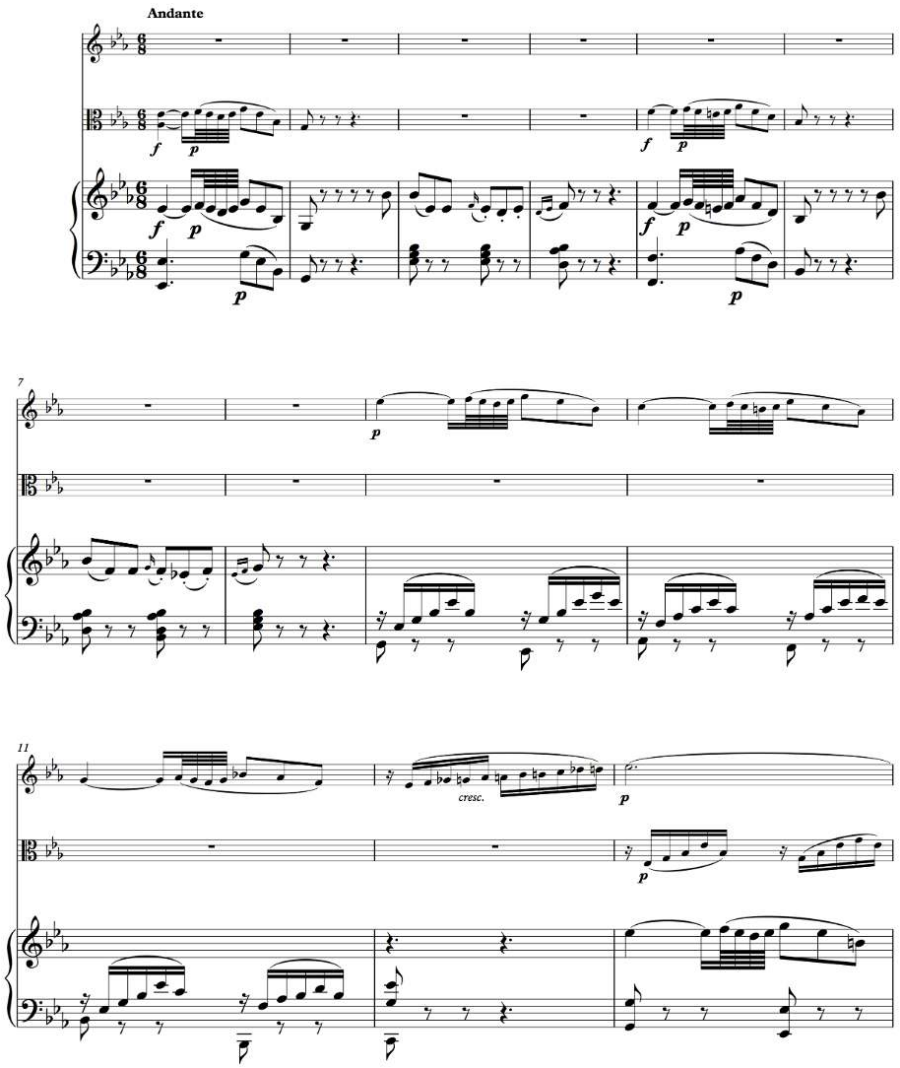
Each 2-bar basic idea is replaced by a 4-bar compound basic idea in the expanded presentation.

A “typical” continuation would have approximately four bars of continuation function followed by four bars of cadential function, but in a compound sentence, this varies greatly. The continuation is commonly shortened or expanded.

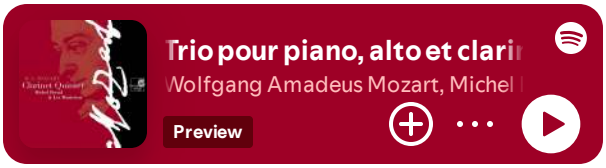


The eight bars that comprise the continuation of the main theme below are constructed from two compound basic ideas, the first beginning on tonic and moving to dominant (mm. 1-4), and the second beginning with dominant harmony and moving back to tonic (mm. 5-8).

Initially, the continuation seems as if it will end after only 4 bars, in m. 12. But the clarinet is missing at the the downbeat of m. 12, and instead begins a link to a four-bar repetition. In this repetition (mm. 13-16), the clarinet melody from mm. 9–12 is played by the piano, who cadences clearly with a PAC at the downbeat of m. 16.



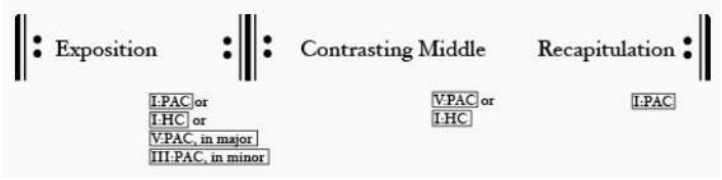
COMPOUND SENTENCE: MOZART, TRIO IN E-FLAT MAJOR FOR CLARINET, VIOLA, AND PIANO, K. 498, I, MM. 1-16



4.6: Classical Theme Types - The Small Ternary

Like the smaller sentence, period, and hybrid themes, the small ternary can act alone as the theme of a full-movement form. The small ternary is larger, however–constructed from themes just as the smaller theme types were constructed from phrases and sub-phrases. As a slightly larger structure, this theme type involves interesting questions about formal organization and perception–questions that stem from its historical pedigree among other things–that we will also find in the full-movement forms.

This theme type is normally expressed through three thematic functions: "exposition (A)," "contrasting middle (B)," and "recapitulation (A)."



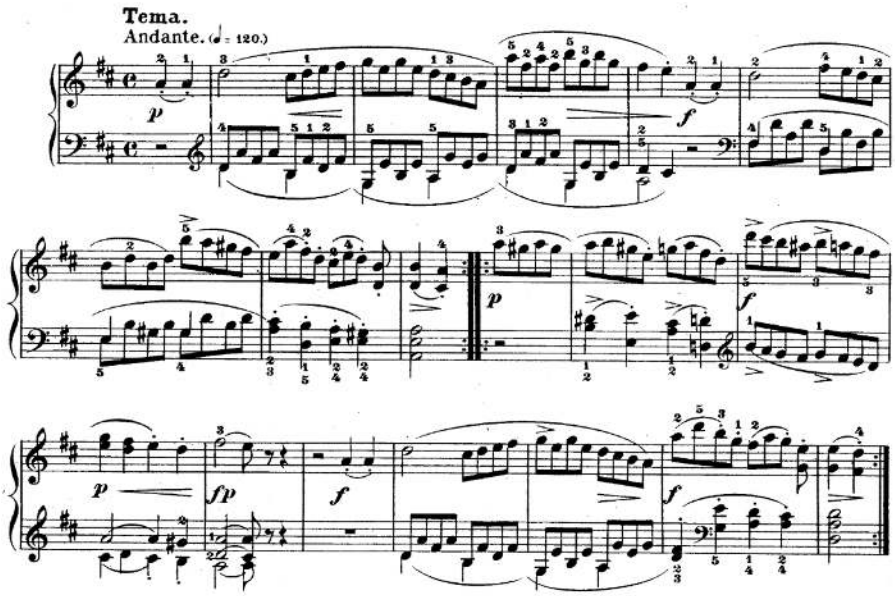
THE SMALL TERNARY

###Three thematic functions The *exposition* and *recapitulation* are "tight-knit" functions usually expressed by one of the smaller theme types. Each ends with a cadence. Most commonly, a small-ternary's *exposition* will end with a I:PAC, but the exposition may also modulate to a closely related key. In major-mode pieces, a typical modulation will yield an exposition ending with a V:PAC, while in the minor mode, the mediant (III:PAC) key area is more common.

A *recapitulation* follows the *contrasting middle* and is marked by a return of thematic material from the *exposition*. In the simplest examples, a *recapitulation* may simply copy the *exposition.* But more commonly, some changes are made, including expansions and contractions. Alterations are especially common–necessary, in fact–when the *exposition* cadences in a non-tonic key: *Recapitulation's* invariably close with a I:PAC, and thus, if the exposition has modulated, the recapitulation must be altered to end in tonic.

Located between the *exposition* and *recapitulation*, the *contrasting middle* is a "loose" formal region that provides melodic and harmonic contrast. Because it is a looser region, it is not commonly expressed by a theme type. If anything, unpredictability is typical. Nonetheless, we can often characterize such passages in terms of "loosening devices" like fragmentation, sequence, and modulation. And as a means of providing harmonic contrast, *contrasting middles* tend to emphasize dominant harmony. To mark their end, provide contrast, and create anticipation for the return of tonic in the *recapitulation*, these sections invariably have dominant harmony at their close. This may be expressed as a I:HC, V:PAC, or in simpler cases, the entire *contrasting middle* may prolong dominant harmony through a "standing on the dominant."

###An example



MOZART, PIANO SONATA IN D MAJOR, K. 284, "TEMA CON VARIAZIONE"

A prototypical example is given above–the “theme” of the variation movement closing Mozart’s Piano Sonata in D major, K. 284. Mozart’s *exposition* is a simple period whose second half modulates to the dominant, ending with a V:PAC. Following the repeat, the *contrasting middle* begins with a *fonte* sequence that leads to a fragmented, descending scalar passage that closes the section with a I:HC. (Note the motivic relationships to the *exposition*: the descending scale in m. 10 recalls the pickup to m. 7, and the *fonte* sets a melodic motive that resembles the first two beats of m. 7.) Finally, the recapitulation recalls the exposition. It presents only the *contrasting phrase*, however, altering it so that the theme ends with a I:PAC.

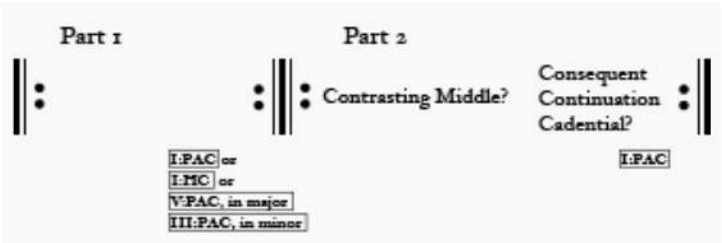
###Binary characteristics Mozart’s theme gives us an example of one of the most common characteristics of the small ternary: the repeat signs. Those repeat signs divide the form into *two parts*, and therein lies one of the most discussed (and perhaps, most controversial and confusing) features of this thematic type. Because on the largest scale the three parts of this theme are nested within *two reprises*, many music theorists prefer to label these passages as *binaries*. Since we have chosen to emphasize the functional characteristics of classical form, of which there are three in this passage, the ternary understanding is more appropriate here. Throughout the history of music, we also find examples without repeats (or with perhaps only one repeat), and those examples establish the repeat signs as a non-obligatory feature.

But rather than settling the question, sophisticated analysts tend to understand the ambiguity present here. As a common hedge, many music theorists label passages like Mozart’s (those with an *exposition*, *contrasting middle*, *recapitulation*, *and* repeat signs) as “rounded binaries.” The “rounded” description refers to the return of the exposition material at the form’s end, which has the effect of “rounding out” the structure.

4.7: Classical Theme Types - The Small Binary

The small binary often fulfills a structural role similar to that as the small ternary. It can be the main theme of any of the full-movement forms, but is most often found as the theme of a theme and variations, rondo, or the minuet and trio.

Small binaries have two parts, each of which is usually repeated. Unlike the "rounded binary," small binaries *do not* include a recapitulation of the material heard in the *first part*.

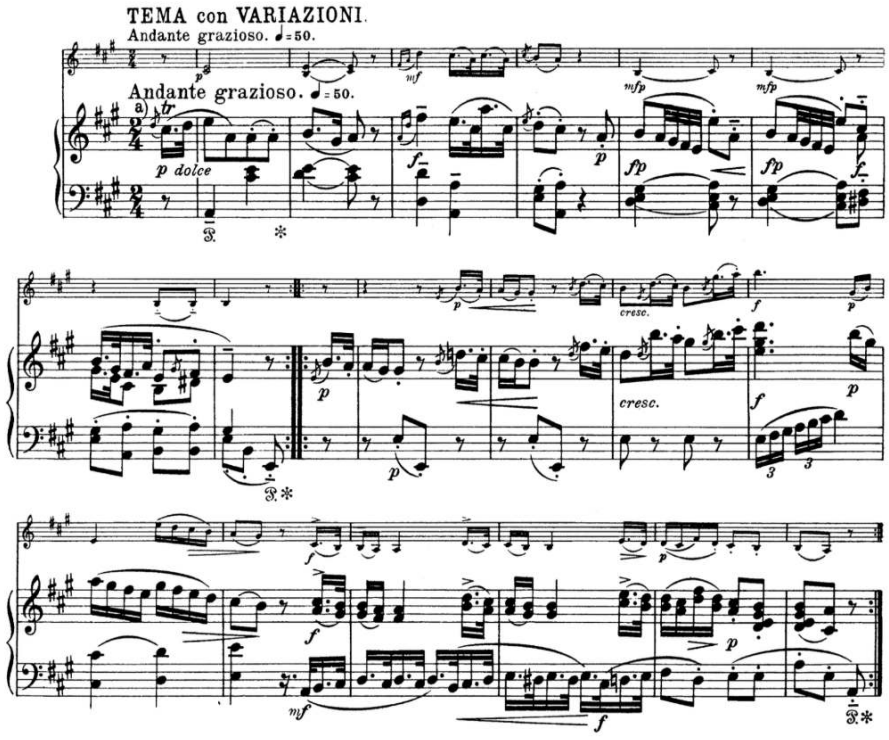


THE SMALL BINARY

###First part Typically constructed as tight-knit period, sentence, or hybrid, the *first part* ends with cadential articulation in the home key or a closely related one. Because a small binary is often smaller than that of the *small ternary,* it is not uncommon to find a I:HC at the close of the first part.

###Second part The *second part* of a small binary quite often begins like a contrasting middle. The material that *follows* the *contrasting middle*, however, is not a *recapitulation*. If it were, the theme would be a small ternary. Rather, this material takes on a variety of guises. Often, it resembles one of the common "after-phrases"–*continuation*, *consequent*, or *cadential*. In the classical style, the second part of a small binary will always close with a I:PAC.

###An example



MOZART, VIOLIN SONATA IN A MAJOR, K. 305

In this small binary, the *first part* is created by a simple period that modulates to and closes in the dominant key with a V:PAC. A *contrasting middle* follows, where we see a typical "standing on the dominant" to support a prolongation of V7. Notice that the

motivic material in the *contrasting middle* is quite similar to the motivic material we hear in the *first part*. This is typical of a small binary, whose *second part* does not contrast with the *first part* to such a high degree as in the *small ternary*. Following the *contrasting middle*, the final four measures of this example resemble a continuation: the melodic motive we hear in the *contrasting material* is fragmented and sequenced, and begins, with the pickup to the penultimate measure, a cadence.

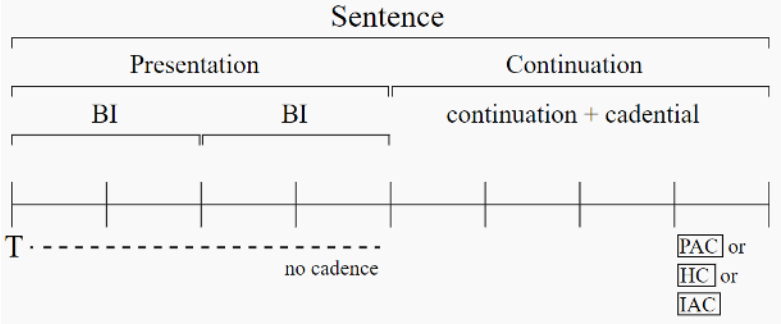
4.8: Classical Theme Types - Reference

The following diagrams outline the key internal characteristics and functional role of the various theme types presented in William Caplin's *Classical Form*. Follow the links below for further explanation and examples.

See also Classical theme functions.

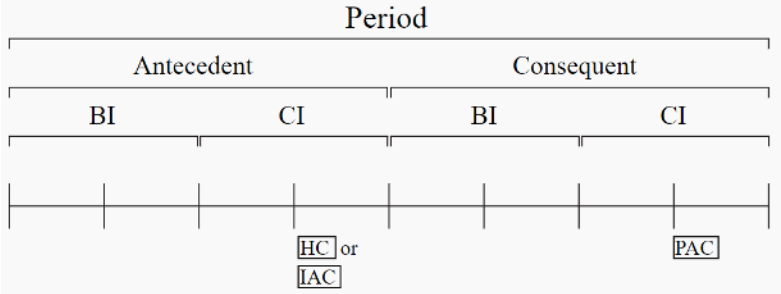
Sentence

For details, click here.



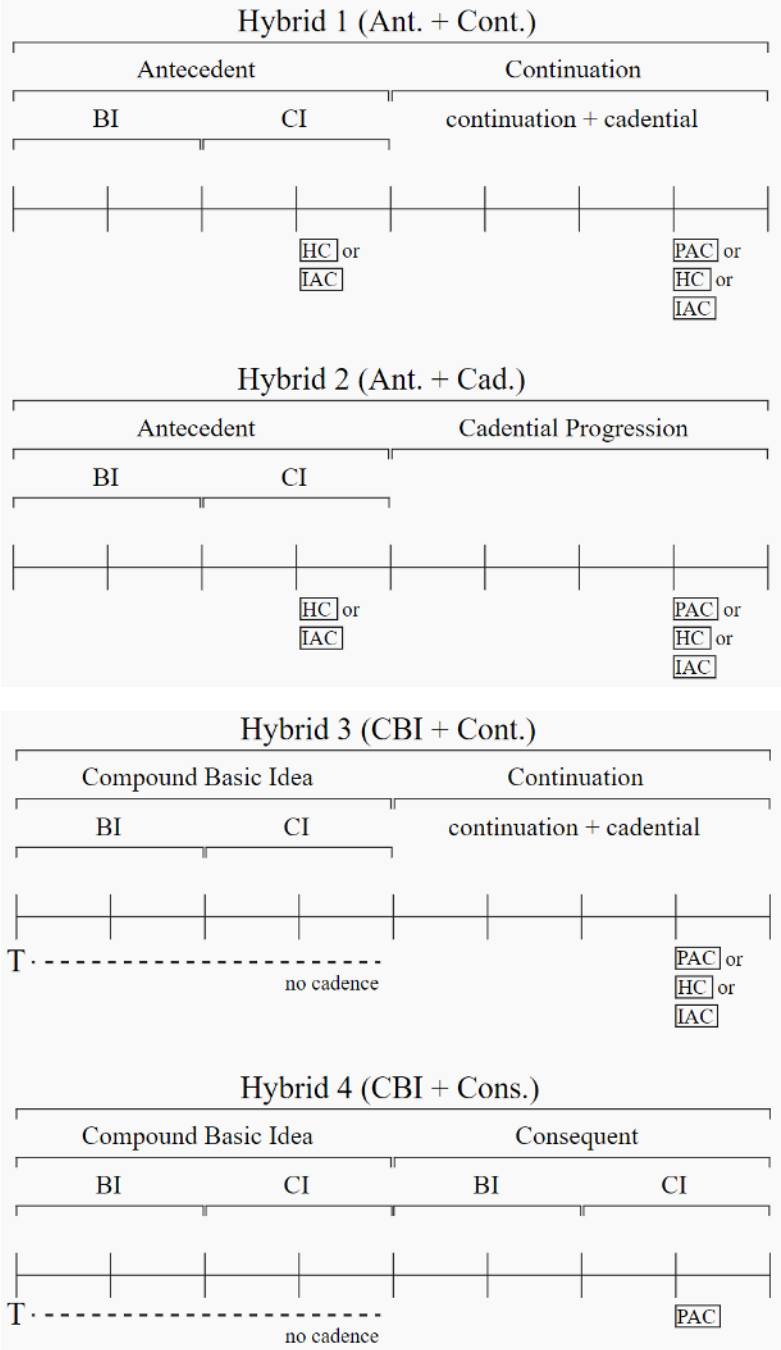
Period

For details, click here.



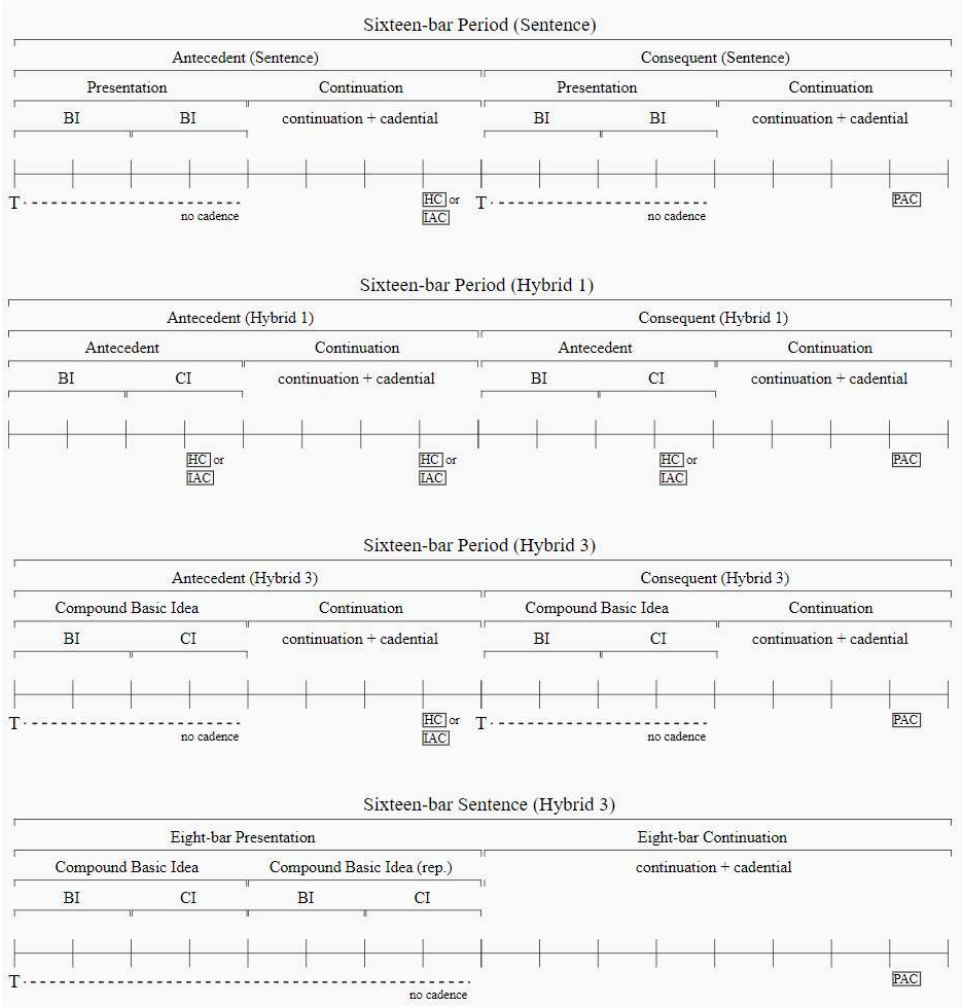
Hybrid themes

For further details, click here.



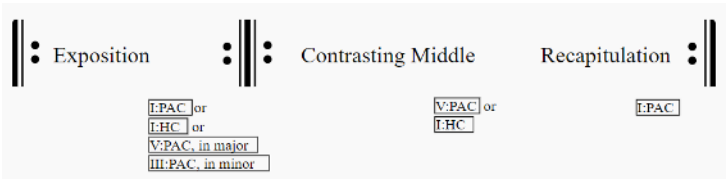
Compound themes

For further details, see Compound periods and Compound sentences.



Small Ternary

For further details, click here.



Small Binary

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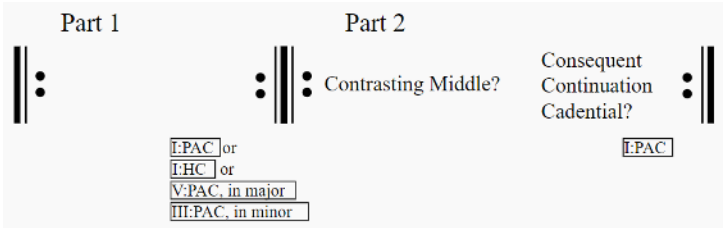


platform.

4.9: Classical Theme Types - Thematic Function Reference

This page is a quick-reference. For examples of these functions in musical contexts, see the resource on Classical theme types.

Initiating Functions

Presentation

Presentation function comes at the *beginning* of a theme or phrase. It involves the *establishment of the primary melodic material* (usually through the use of one or more statements of a *basic idea*) and the *establishment of the tonality of the theme* (usually through *tonic prolongation*).

Antecedent

Antecedent function comes at the *beginning* of a theme or phrase. It involves the statement of a *basic idea* followed by a *contrasting idea*. An *antecedent* should close with a weak cadence, usually a HC or IAC.

Medial Functions

Continuation

Continuation function comes in the *middle* of a phrase or theme. It typically involves the *breakdown of the primary melodic material* and *harmonic acceleration* towards the cadence.

Following are important terms/concepts associated with continuation function. Not all need be present for a passage to express continuation function, but some should be.

- *Fragmentation* – Breaking the melodic unit into smaller chunks (for example, following two-bar basic ideas in the presentation with one-bar melodic ideas). Note: fragmentation references the breakdown of the *size* of the units. Those units are not necessarily related melodically.
- *Liquidation* – Gradually replacing the *characteristic* or unique parts of a melody with *conventional* or common elements.
- *Sequential repetition* – Repeating the same melodic or harmonic element two or three times, transposed to different pitch levels. This is often used in conjunction with fragmentation.
- *Acceleration of melodic rhythm* – Changing from predominately quarter notes and eighth notes in the melody to predominately eighth notes and sixteenth notes, for example.
- *Acceleration of harmonic rhythm* – Chord changes coming more frequently (changing from one chord per bar to two chords per bar, for example).

#Closing Functions

Cadential

Cadential function comes at the end of a theme or phrase. It typically involves a *cadential harmonic progression* and a *conventional, descending melodic pattern*.

A classical cadential progression *begins with the last chord of tonic prolongation* and *ends with a cadential arrival*. The three typical types of cadential arrival in Classical music are the perfect authentic cadence (PAC), the imperfect authentic cadence (IAC), and the half cadence (HC).

A half-cadential progression will begin with the final **T** chord, progress (optionally) through **S**, and arrive on a cadential **D** chord (*always* **D5**: **V** or $\mathbf{V^7}$):

> ***T__ (S__) D5***

An authentic-cadential progression will begin with the final **T** chord, progress (optionally) through **S**, and end with the cadential **D T** progression (*always* **D5 T1**: $\mathbf{V^{(7)}}$ **I**):

> ***T_ (S_) D5 T1***

Consequent

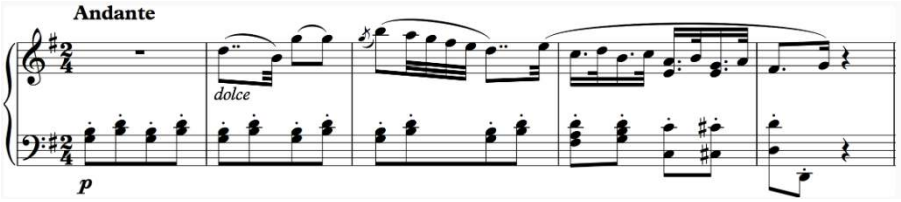
Consequent function resembles *antecedent function* in that it involves the presentation of a basic idea followed by a contrasting one. Unlike the *antecedent function*, however, *consequent function* brings completion to a thematic unit. Therefore, it ends with a strong cadence, typically a PAC.

4.10: Techniques of Phrase Rhythm - External Expansions

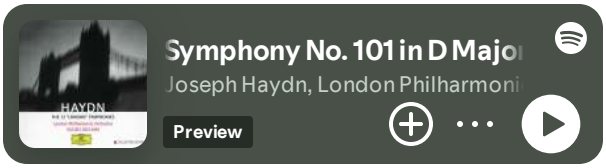
A theme is often preceded or followed by material outside of its typical boundaries, but which is clearly dependent on the theme. This material is *external* to the theme itself— “before-the-beginning” or “after-the-end,” as William Caplin as termed it.

Prefix

An *prefix* is a passage—short or long—that *precedes* a theme. Short prefixes lack distinct motivic material and/or harmonic progression. While connected to the theme that follows, when removed prefixes do not disturb the logic of the phrase itself.



PREFIX: HAYDN, SYMPHONY NO. 101, "CLOCK"



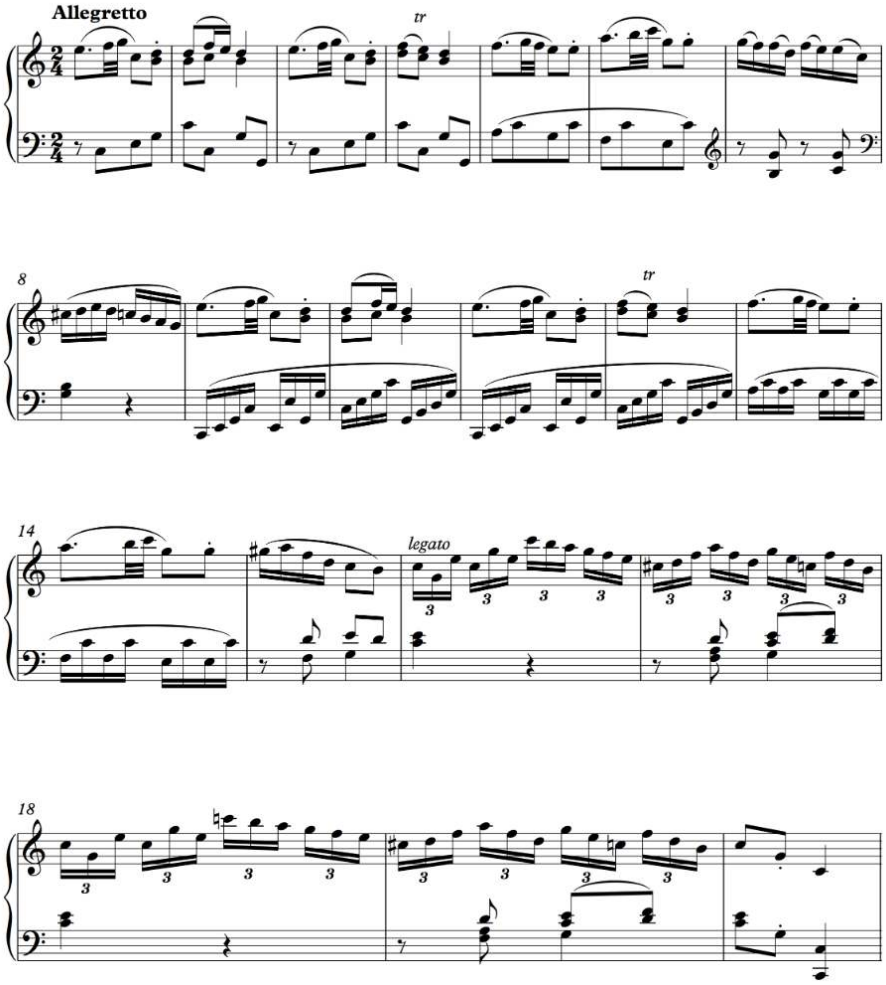
Here, a one-measure, accompanimental prefix prepares the four-measure antecedent phrase that begins in m. 2. The prefix lacks both a characteristic melody and harmonic progression.

Suffix

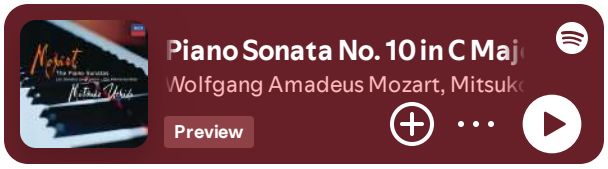
A suffix prolongs the harmony that closed the theme. Suffixes are described, and given different names, according to what kind of cadence, PAC or HC, ends the theme to which they are attached.

###Closing sections

Sometimes called *codettas*, *closing sections* follow themes that end with PACs.



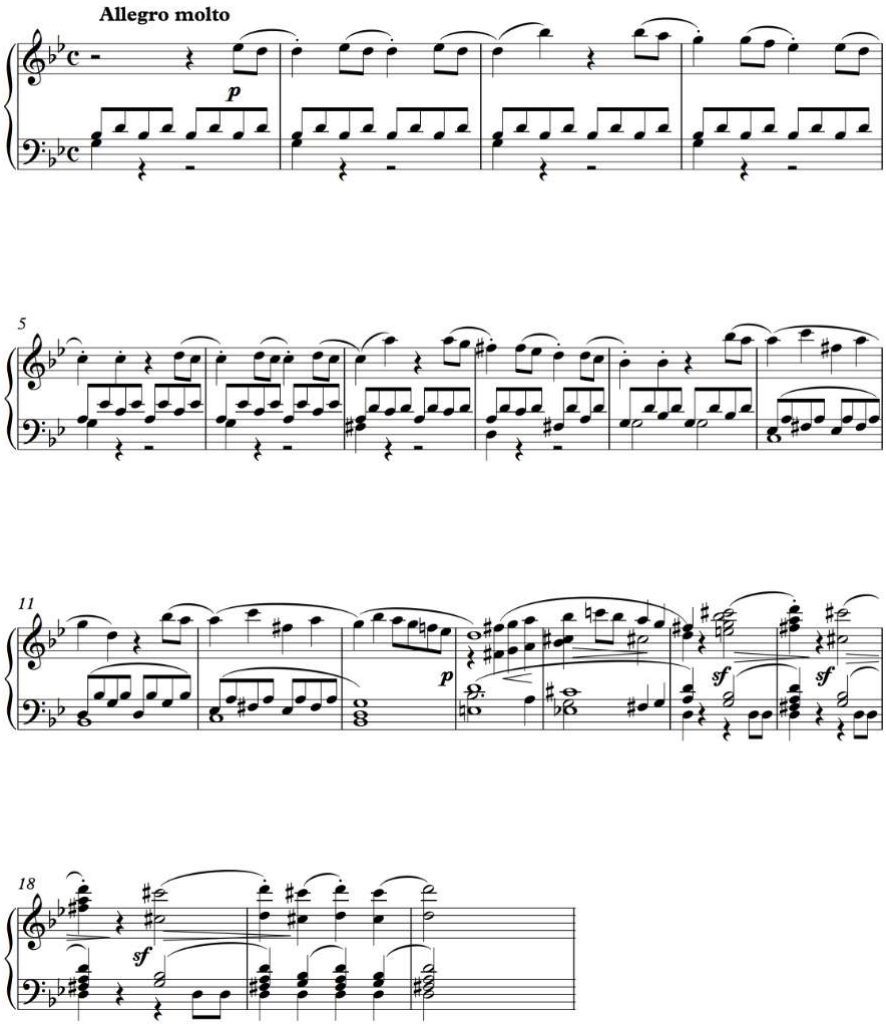
CLOSING SECTION: MOZART, PIANO SONATA IN C MAJOR, K. 330



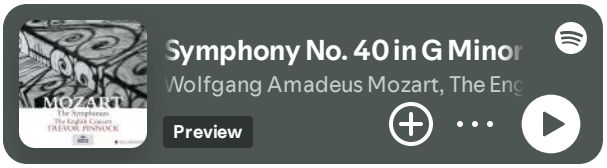
The compound period here ends with a PAC in m. 16. Following the cadence, a five-measure *closing section* serves to confirm it. Notice that the melody is centered around scale degree 1—a common feature of these passages—and that harmonically the ii–V-I cadential progression that ended the theme (see m. 15 and 16) is simply repeated.

###Standing on the Dominant

When a *suffix* follows a half cadence, we refer to it as *standing on the dominant*. These passages are often signals for thematic entrances (such as the second theme of a sonata form movement) or thematic returns (such as the recapitulation in a small ternary).



STANDING ON THE DOMINANT: MOZART, SYMPHONY NO. 40, K. 550, I



This famous example begins with a one-measure prefix followed a compound sentence. The compound sentence ends with a half cadence in m. 16. (Notice the augmented sixth chord that precedes it.) The succeeding measures *stand on the dominant*, prolonging the cadence by emphasizing dominant harmony with scale degree 5 embellished melodically.

4.11: Techniques of Phrase Rhythm - Internal Expansions

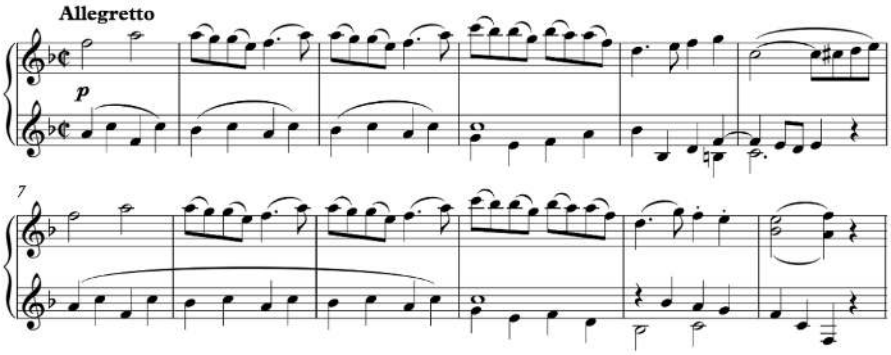
For many different reasons, a great deal of music written in the late eighteenth and nineteenth centuries exhibits metric patterning, at many different levels of hypermeter, that is duple in structure. Such was the tendency in the nineteenth century that William Rothstein, in *Phrase Rhythm in Tonal Music*, has memorably dubbed this "the Great Nineteenth-Century Rhythm Problem." It is "a danger," Rothstein says,

> *endemic in 19th-century music, of too unrelievedly duple a hypermetrical pattern, of too consistent and unvarying a phrase structure—the danger, in short, of submitting too complacently to 'the tyranny of the four-measure phrase.'*

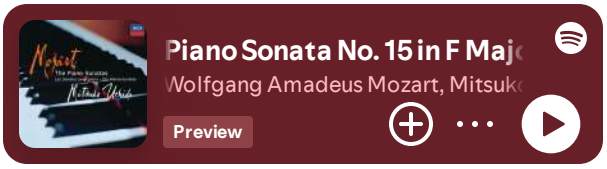
Music in the classical tradition was quite often less subservient to the two- and four-bar units. While this topic has been the subject of a great deal of musical theoretical exploration, here we will concentrate on a simple and common type of *sub-phrase* and *phrase expansion*.

##Sub-phrase Expansion##

When a two-measure basic idea or contrasting idea is expanded, that expansion is often accomplished through motivic repetition within the basic idea: a motive or other small melodic figure is repeated, either exactly or with simple embellishment, causing the overall length of the sub-phrase to be larger than the expected.



SUB-PHRASE EXPANSION: MOZART, RONDO, K. 494, MM. 1–12



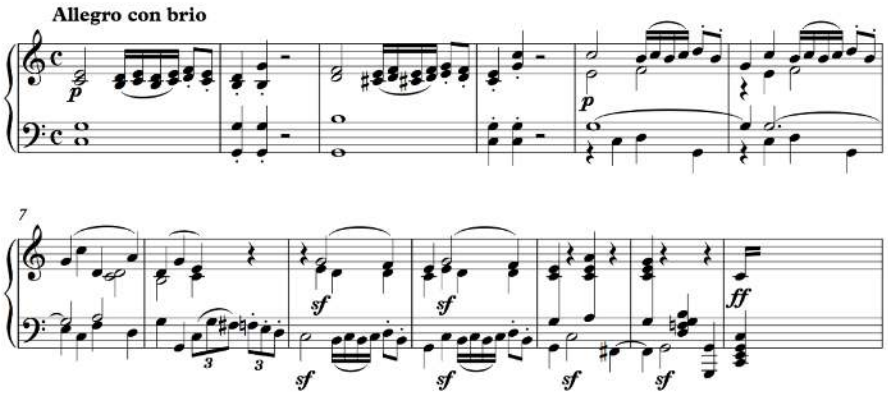
Mozart's Rondo in F begins with a period. A half cadence in m. 6 is followed by a consequent phrase that ends with a PAC in m. 12. The theme's exceptional length is caused in part by an *expansion* of the initial basic idea: in m. 3, the piano repeats m. 2. One could imagine a simple recomposition of the passage, omitting m. 3, that would restore the sub-phrase to a normal, 2-bar length.

The *contrasting idea* is also three bars long. But in this case, it is *less clear* if the greater length is due to *expansion.* There is *no repetition*, and it's difficult to imagine a two-measure recomposition of the *contrasting idea* that wouldn't destroy some aspect of its melodic or harmonic structure.

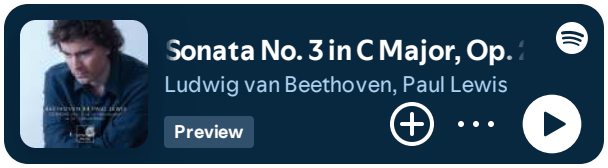
In other words, *irregular lengths* don't always indicate that an expansion has occurred.

##Phrase Expansion##

Phrases are often expanded by repetition as well—most often in the concluding portion of a theme as a means to delay cadential arrival.

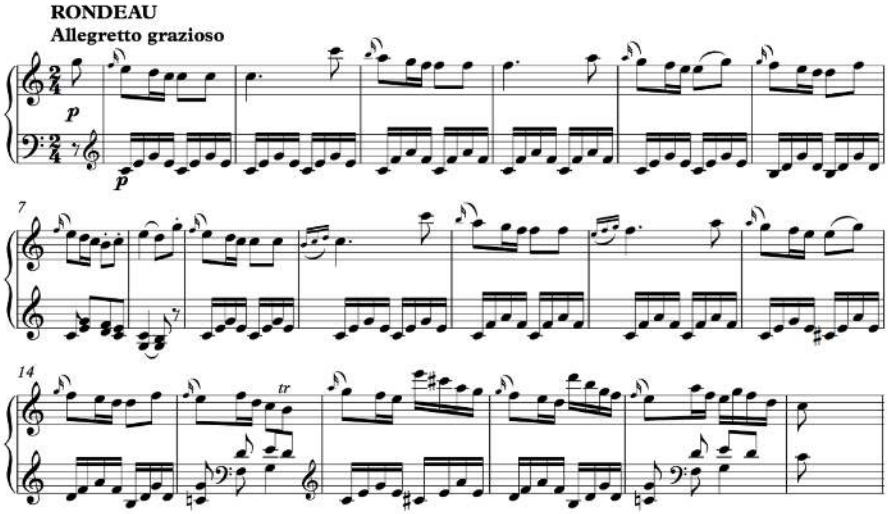


PHRASE EXPANSION: BEETHOVEN, PIANO SONATA, OP. 2, NO. 3

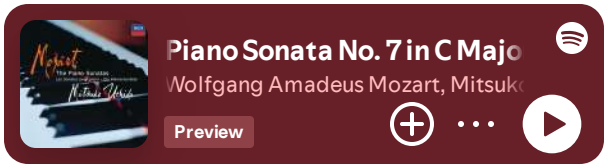


The main theme's first eight measures form a simple sentence. But at the moment of expected PAC in m. 8, the melody find scale degree 3, creating an IAC. At the same time, the bass plays a descending link into a repetition of the continuation that leads to a PAC in m. 13. This phrase expansion, thus, adds five measures to the length of the basic phrase.

In the example above, the cadence in m. 8 gave rise to an expansion because as it was weaker than expected. (Primary themes rarely conclude with IACs.) This is one of the most common musical motivations for a phrase expansion. In addition to IACs, deceptive cadences can lead to expanded phrases, and not uncommonly, an expected cadence never materializes at all—an event often called an "evaded cadence."



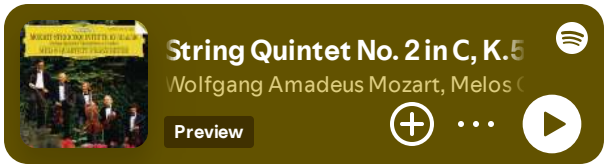
PHRASE EXPANSION: MOZART, PIANO SONATA IN C MAJOR, K. 309, III



The primary theme of this sonata is a compound period made from two sentences. Following the half cadence in m. 8, the *large consequent* is expected to conclude with a PAC in m. 16. But the PAC never materializes: the leading tone in m. 15 is not resolved, the pianist's right hand leaps up to A5 instead. The cadence, in other words, is *evaded*. The next four measures (mm. 16–19) are a varied repeat of mm. 13-15, "one more time," culminating in a PAC in m. 19.

##Non-standard Lengths We often find expansions in places where the size of a sub-phrase or phrase has been increased. The phrase expansion described above created an 11-bar continuation, for example. But irregular phrase lengths do not necessarily indicate the presence of a phrase expansion.

For example, listen a few times to the first 30 seconds of the following passage, from Mozart's String Quintet in C major, K. 515. Its main theme is a compound sentence. The theme's presentation has three basic ideas (at 0:00, 0:09, and 0:16), each of which is constructed as a compound basic ideathat contains a basic idea followed by a contrasting one:



We hear in this passage that the compound basic ideas are five measures long, each basic idea itself lasting three measures! But *no phrase expansion* has occurred here. The basic idea is simply longer than normal, and perhaps a bit looser feeling as a result. When in doubt, the central question is whether a passage might be recomposed, duple-fied *without* destroying its melodic, harmonic, and motivic structure. If you can, there is a case to be made that an *expansion* is present.

CHAPTER OVERVIEW

5: Form (II) - Other Forms and Thematic Structures

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5.1: Sonata Form - Introduction to Sonata Theory

A classical *sonata* is a multi-movement work for solo instrument, chamber ensemble, or orchestra with at least one movement in *sonata form*. Almost always, the first movement of a sonata is in sonata form. The last movement is typically an upbeat *finale*, which can be in a number of different forms. Inner movements (second movement of a three-movement sonata; second and third movements of a four-movement sonata) are typically slow movements and/or dance movements (minuets or scherzos). Any non-dance movement in a sonata can take sonata form, but rarely *all* of them at once. Commonly, only the first movement takes sonata form, or the first and one other movement. The other movements will take other standard forms, such as minuet/trio, theme-and-variations, rondo, or sonata-rondo. In this unit, we will focus on sonata forms, particularly as they are found in first movements of instrumental sonatas.

Sonata form

Sonata form shares many structural properties with *small ternary* form (specifically the *rounded binary* variant). That is, the core music of a sonata movement can be understood as exhibiting a large, three-part pattern of ABA'.

However, like small ternary, a sonata-form movement also has a two-part structure, with the first A section forming the first "half" of the movement, and the B and A' sections working together to form the second "half." This is most obviously seen in early sonata movements, which repeat each of those two parts. This is called a *double-reprise* structure, and on this level looks exactly like a rounded-binary theme.

||: A :||: B A' :||
which sounds like
AABA'BA'

Later sonatas shed the repeat of the second reprise, only repeating the first reprise.

||: A :|| B A' ||
which sounds like
AABA'

Still later sonatas often shed both sets of repeats, making the binary aspect of the structure much less obvious (if it even exists) than the ternary aspect of the structure.

|| A || B A' ||
which sounds like
ABA'

The A section (or *module*) exhibits what we call *exposition* function, and the A' section exhibits *recapitulation* function. (These are the same names as other small ternary forms, like a minuet or the theme of a theme-and-variations movement.) The B section exhibits what we call *development* function. (This differs from the *contrasting middle* of other small ternary forms.) These functions will be briefly defined below and explored in greater detail in other resources.

As in minuets, it is common and acceptable to refer to the A section as "the exposition," the B section as "the development," and the A' section as "the recapitulation," as long as we retain the conceptual difference between formal modules (the passages of music) and formal functions (what those passages *do* in the context of the larger musical structure).

Formal functions in a sonata movement

Exposition function involves three important features:

- establish the home-key tonality;
- move to and establish a secondary key by means of a strong cadence (PAC), called the *essential expositional closure* (EEC); and
- lay out the melodic themes and thematic cycle that will form the foundation for the rest of the movement.

We can think about this as a question, or at least an incomplete statement: all the main melodic material of the movement is presented, but it ends in the "wrong" key.

Development function highlights the openness of this question by cycling through the same melodies in the same order, exploring the instability of the secondary key. This exploration can be accomplished by any of the following:

- beginning in the secondary key, but modulating to another key before achieving a cadence;
- employing non-functional harmonic progressions, such as harmonic sequences;
- frequent modulation; or
- multiple tonal goals other than the home key or secondary key.

It then intensifies the need for an "answer" by progressing toward an *active dominant* (an HC or a major arrival on V or V^7) in the home key.

If exposition function presents a "question," and development function explores and then intensifies this question, **recapitulation function** answers the question. Recapitulation function does this by progressing one last time through the thematic cycle, but this time bringing it to a satisfactory completion: a PAC in the home key, called the *essential sonata closure* (ESC).

Cadential goals

As hinted at above, sonata form is anchored around several important cadences. They serve as signposts for the formal structure, as well as goals of the music leading into them. We will note these cadences using a Roman numeral for the key (relative to the home key) followed by a colon and the type of cadence.

As in small ternary form, the exposition tends to end with a PAC in a *secondary key* (V:PAC in a major-key movement, III:PAC or v:PAC in a minor-key movement). Rather than being simply a norm, though, this cadence is *essential* to the form. This PAC is called the *essential expositional closure*, or EEC.

The recapitulation has a corresponding cadence, also familiar from small ternary form: a PAC in the home key, which tends to correspond thematically with the EEC. This I:PAC is called the *essential sonata closure*, or ESC.

The development section, like the contrasting middle in small ternary form, typically ends with a HC in the home key (I:HC) or a *dominant arrival* in the home key, which prepares the arrival of the recapitulation.

: exposition **V:PAC** : : development **I:HC** recapitulation **I:PAC** :

or

: exposition **III:PAC** : : development **I:HC** recapitulation **I:PAC** :

Commonly, the exposition and recapitulation each have an additional cadential goal that is not shared with other small-ternary-like forms. These goals each occur between the beginning of the module and the cadential goal (EEC or ESC), and they often—though not always—involve a pause or stoppage of melodic or harmonic motion. Thus, each of these halfway cadences is called a *medial caesura* (MC). Both PACs and HCs, in the home key or in a secondary key, can function as medial caesurae.

Defaults and deformations

Sonata form is not a single recipe for structuring a movement. It is a set of norms that are almost always violated, or at least altered, in some way in a composition. Thus, we can talk about individual pieces being "in dialog with" sonata norms. That is, they incorporate enough of the definitive elements to be considered "in sonata form," but they carry enough unique elements to cause some tension with the norms. Over time, some of the unique elements used by classical composers were adopted by others and became norms for a later generation. Thus, even the "typical" sonata movement is different at different times and places in history.

In general, though, for each element of sonata form, we can identify default properties of that element. Sometimes there are multiple possibilities that can be considered normative. For example, the most common cadence used for the MC of a classical sonata movement is V:HC. This is called the *first-level default*. The second most common MC cadence is a I:HC—the *second-level default*. Where multiple possibilities are normative, but one is more common or preferred over another, we use this language.

Non-default properties of a particular sonata movement are called *deformations*. For example, a II:IAC MC is not at all typical of classical sonatas. Thus, we would consider it a deformation. It does not mean that a II:IAC cannot function as an MC (though I

can’t think of an example). However, it means that a II:IAC is a purposeful move by the composer to contradict the norm. As such, any analysis should address this deformation and attempt to explain its musical and historical significance.

Auxiliary modules

Often the exposition–development–recapitulation structure is framed by an *introduction* and/or a *coda*. Though important musical activity can take place in these modules, they are outside the sonata proper. The essential sonata elements, as well as the ones that are similar enough from piece to piece that we can generalize about them well, take place in the exposition, development, and recapitulation. Though we will address introduction and coda materials during in-class analyses, and you should address them in your own analyses, the properties of those modules are not covered by these online resources.

Further details

The remaining sonata resources on this website are largely in reference format. Rather than walk through the details in the manner of a typical textbook, they will provide you with the defining features of the elements described in as concise a manner possible. This consision will serve you well when referencing these resources quickly during analytical activities. However, it will also force you to wrestle with them in the context of real pieces in order to understand them fully. If you simply read these resources, you will not understand sonata form. You must make use of them while listening to and analyzing music in order to assimilate the information and develop the skills necessary to apply them musically.

5.2: Sonata Form - Exposition Types

The exposition module of a sonata movement comes at or near the beginning of a sonata-form movement. Only an *introduction* (technically, a large *prefix*) might precede it. It exhibits exposition function, and thus has three jobs: *establish the home key*, *move to and establish a secondary key with a cadence*, and *lay out the thematic cycle* that will serve as the foundation for the development and recapitulation.

There are two main types of sonata expositions: the *two-part* exposition and the *continuous* exposition.

The two-part exposition

The two-part exposition is divided into two parts: the first part ends with the arrival of the *medial caesura* (MC, the major cadence, often accompanied by a musical pause, in the middle of the exposition), and the second part follows the MC and ends with the *essential expositional closure* (EEC, the major PAC in the secondary key) and any postcadential/closing material that follows it.

A two-part exposition typically exhibits the following thematic cycle (in order):

- **Primary theme (P)** – home key
- **Transition (TR)** – ending with the *medial caesura (MC)*
- **Secondary theme (S)** – secondary key (V or III), ending with the *essential expositional closure (EEC)*
- **Closing space (C)** – secondary key; optional
- **Retransition (RT)** – recapturing of dominant harmony in home key to prepare repeat of exposition; optional, and only occurs in a first ending

We can abbreviate this cycle:

> ***P TR ‘ S / C***

(The apostrophe stands for the MC; the slash stands for the EEC.)

Each of these terms is defined below.

A sample two-part exposition: W.A. Mozart, Sonata for piano in B-flat major, K. 333, I.

Multiple MCs

Sometimes, a composer sets up a two-part exposition, reaches a satisfactory MC, but the S theme that follows degenerates before it can achieve the EEC. In such a case, the degenerated S theme becomes like a new transition and leads into another MC, followed by an S theme that *can* reach a satisfactory EEC. Hepokoski and Darcy call such a situation a *trimodular block (TMB)*. We will just call it an exposition with two MCs.

A two-part exposition with two MCs typically exhibits the following thematic cycle (in order):

- **Primary theme (P)** – home key
- **Transition (TR)** – ending with the *medial caesura (MC)*
- **"Failed" secondary theme (S?)** that does not produce an EEC, but instead leads to a second MC
- **"Real" secondary theme (S)**, ending with the *essential expositional closure (EEC)*
- **Closing space (C)** – secondary key; optional
- **Retransition (RT)** – recapturing of dominant harmony in home key to prepare repeat of exposition; optional, and only occurs in a first ending

We can abbreviate this cycle:

> ***P TR ' S? ' S / C***

The two MCs tend to adhere to one of the following patterns (the first being by far the most common; H/D, p. 171):

- I:HC followed by V:HC
- I:HC followed by V:PAC
- V:HC followed by V:PAC
- V:HC followed by V:HC

The continuous exposition

Unlike a two-part exposition, a continuous exposition has no MC followed by a secondary (S) theme. Instead, the transition (TR) module gives way to a "spinning out" of a series of related, fragmented melodic units. This succession of small, "spinning out" modules is called *Fortspinnung* (Ger., "spinning out"). These fragments are often, but not necessarily, taken from the primary (P) theme. *Fortspinnung* is often associated with TR in general, but in a continuous exposition, the process gets out of control and fails to produce a satisfactory MC. Instead, the motives continue to "spin out" and maintain a high level of energy right up to the EEC.

The continous exposition follows the thematic cycle:

- **Primary theme (P)** – home key
- **Transition–Fortspinnung (TR=>FS)**, ending with the *essential expositional closure (EEC)*
- **Closing space (C)** – secondary key; optional
- **Retransition (RT)** – recapturing of dominant harmony in home key to prepare repeat of exposition; optional, and only occurs in a first ending

We can abbreviate it:

> ***P TR=>FS / C***

A continous exposition may present no cadences that could be "candidates" for an MC, it may suggest the possibility of an upcoming MC that is evaded, or it may present an MC that fails to produce a satisfactory S theme (and thus is not really an MC). In each case, an EEC is achieved without first arriving at an MC and an S theme.

5.3: Sonata Form - Structural Points of Arrival

A sonata exposition has two structural arrival points, all associated with, but not equivalent to, cadential arrivals.

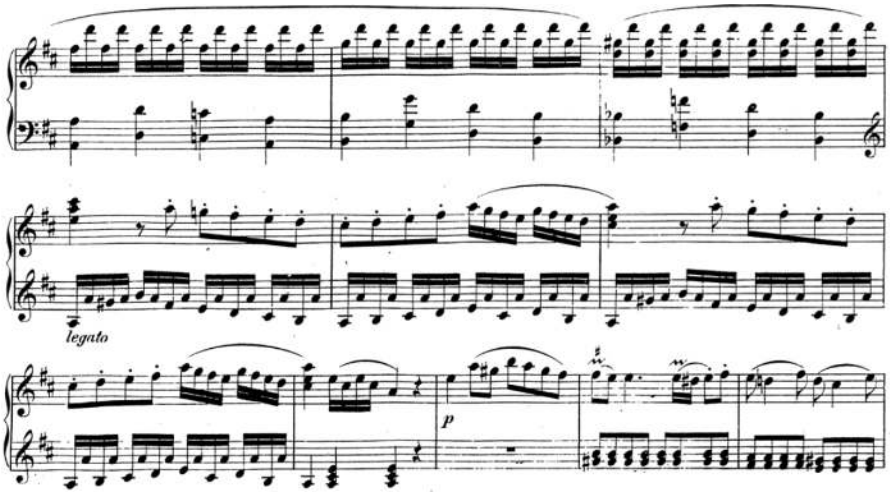
Medial caesura (MC)

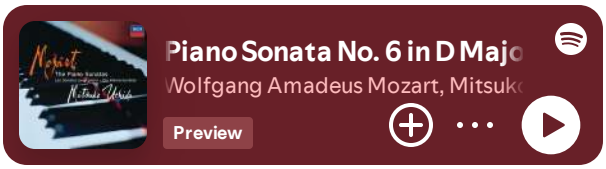
James Hepokoski and Warren Darcy (whose theory forms the basis of these reference materials) recommend that when analyzing a sonata exposition, "the first task [is] to locate and identify the treatment of the *MC*" (p. 24). In a two-part exposition the moment marks the end of the part one of the exposition and thus indicates the imminent arrival of the subordinate theme, which begins part two. Prepared by energy that has been gained in the transition zone (TR), the MC is a rhetorical break–quite often a rest or silence–that dissipates the transition's energy, opening "space" for the onset of S. The first step in locating in an MC is to look for this break, which is often as simple as finding rests immediately before music in the subordinate key.

Medial caesuras are always associated with a cadence–most often a half cadence. Though importantly, *MCs are not cadences* in themselves. Typically, the transition module leads to an HC, and a "standing on the dominant" is used to gain energy that will culminate in the MC. (H/D call this a "dominant lock.") Occasionally — especially in slow movements or shorter movements — the MC and structural HC will occur at the same time, though technically, they are not the same thing!

In the following example (from Mozart's Piano Sonata in D major, K. 284), the transition's continuation reaches an HC at the beginning of the second line (marked legato). The dominant is prolonged via a "standing on the dominant," and the MC is reached 5 measures later, marked by "three hammer blows" in the left hand and a one-beat silence.

Mozart Piano Sonata in D major, K. 284, i





As mentioned, the most common cadence associated with an MC is a half cadence. Typically, the HC occurs either in the home key, which we will call a I:HC MC, or the secondary key, a V:HC MC or III:HC MC.

These musical characteristics often lead to an MC, and are associated with the transition module (discussed below):

- *energy gain* leading into the HC;
- a continuous maintaining of energy between the HC and the MC.
- a pause or break in the musical texture at the MC (sometimes *filled* by a single voice or other greatly reduced texture—what H/D call "caesura fill");

Other common, but by no means required, features are:

- *fa–fi–sol* in the bass (or sometimes, *le–sol*), leading into the HC;

- a thrice-repeated chord of arrival immediately preceding the break (what H/D call “hammer blows”).

For an MC to be a real MC, it must be followed by a satisfactory subordinate (S) theme (see below). A cadence that otherwise could function as an MC, but is not followed by a satisfactory S theme, is considered a case of “medial caesura declined,” or could indicate the presence of a continuous exposition.

Essential expositional closure (EEC)

In the exposition of a sonata movement, the EEC is “the first satisfactory PAC within the [subordinate] key that goes on to differening material” (Hepokoski/Darcy, p. 18). It is *not* optional, and it is *always* in the subordinate key. In a major mode, it will nearly always be a V:PAC, and in the minor mode, it is most often a III:PAC. The closing zone (C) immediately follows the EEC.

Two features of the EEC are of great importance: (1) it coincides with the *first* satisfactory PAC, and (2) it is followed by *differing* material. *Often, the rhetorically strongest PAC in the dominant is not the EEC.*

Once the PAC has been achieved, any new material is part of a *closing zone (C)*, as it is no longer under the purview of *S*.

5.4: Sonata Form - Thematic Modules

The four thematic modules that comprise a typical two-part sonata exposition (P, TR, S, and C) create a thematic rotation that is found again in the recapitulation and often referenced in the development.

Primary theme module (P)

The P theme has several functions: (1) establish the home key, (2) present the primary melodic material to begins the thematic cycle, and (3) begin the motion toward the MC and the EEC.

Most often a P theme is harmonically closed, ending with a I:PAC or, less typically, with a I:HC. (In smaller sonatas, P might be a single phrase (antecedent or presentation) that does not end with a cadence.) When a P theme ends with a PAC and is followed by another theme also ending with a PAC, the P module contains a "primary theme group." The themes in a primary theme group are differentiated with subscripts: P1 and P2.

A P theme may exhibit any standard theme type (sentence, period, hybrid, compound), though sentences are more common. Typically, a P theme is relatively "tight-knit" as compared to other thematic modules, containing a more straightforward presentation of tonic and less phrase deviations.

Transition module (TR)

The TR module's principal functional role is to drive toward the MC that marks its end. This is both a harmonic motion and a rhetorical motion, characterized by *energy gain*. An analysis of a TR module should center around the MC and how the composer approaches it.

Harmonic motion

In a sonata, a transition may be "modulating" or "non-modulating." A non-modulating TR will lead to a I:HC MC, while a modulating TR leads to a V (or III): HC MC.

Melodic/motivic characteristics

We will follow Hepokoski & Darcy's practice of locating the beginning of TR at the start of a phrase. In general, once you hear TR function clearly projected, track back to the beginning of that phrase and label it the beginning of TR. Unlike primary themes, transitions are much "looser" thematically. This module of the sonata is often associated with phrase expansions and compression. More generally, anything that can be associated with *continuation function* fits transition function, as well: fragmentation, liquidation, acceleration of melodic or harmonic rhythm, etc.

Melodically, we classify transitions as (1) *independent*, or (2) *dissolving*.

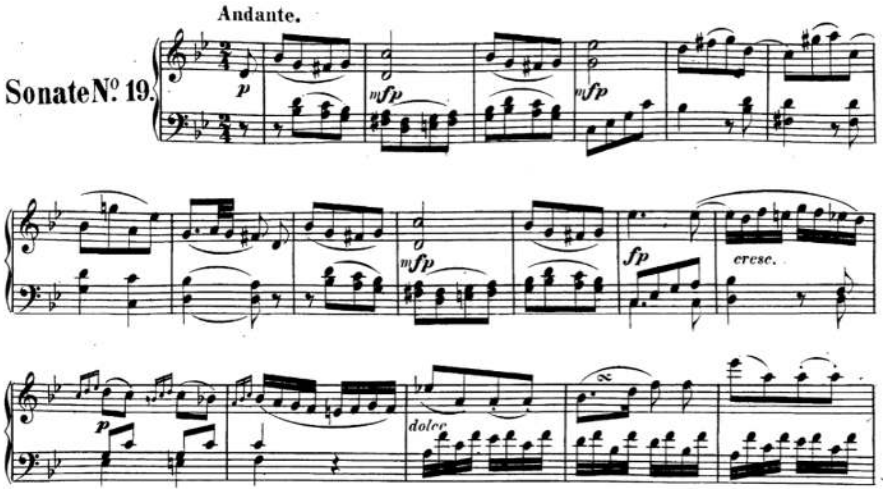
An *independent TR* begins with new thematic material. In other words, it is not P-based.

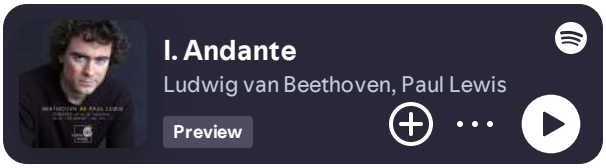
Dissolving TR modules all take some part of the P theme and dissolve, degenerate, or liquidate as the module gains energy and moves toward the MC.

- In the case of a *dissolving* restatement, P ends and then seems to begin again. This restatement of P dissolves into TR function, and we can subsequently reinterpret the whole theme as a dissolving-restatement type of TR.
- In a *dissolving* consequent, continuation, or hybrid, the P module will consist of the opening phrase of a theme, and the closing phrase of the theme will begin as usual but degenerate into TR.
- A *dissolving* P-codetta will introduce post-cadential material to reinforce the cadence at the end of P, and that post-cadential material will dissolve into TR rhetoric.

In the following example from Beethoven's Piano Sonata in G minor, Op. 49, No. 1, a III: HC MC is clearly found in m. 15 and coincides with the structural HC. Backtracking, notice the continuational characteristics at m. 12 which indicate that the transition must begin at m. 9. (Remember, we always begin a transition at the *start* of a phrase.) Both the primary theme and transition begin with the same presentation, and therefore, this is a *modulating*, *dissolving* transition. As a listener, we will likely not realize that the transition is a transition until we reach m. 12, where the continuation begins to project characteristics associated with TR.

Beethoven, Piano Sonata in G minor, Op. 49, No. 1, i





Subordinate theme module (S)

The chief function of *S*, which is in the subordinate key of the sonata, is to lead to a PAC in that key — the *essential expositional closure (EEC)*. Because of its role in relation to this central harmonic event (and its corresponding cadence in the recapitulation, the ESC), the S module is of immense importance and interest in a sonata-form movement. Hepokoski and Darcy go so far as to say that "what happens in S makes a sonata a sonata" (p. 117). Because the EEC is of such structural importance, its arrival is often delayed and dramatized to a great degree.

Thematically, the S theme is much looser than the P theme. It is typical to find extended continuations and expanded cadential passages, all as a means towards dramatizing the eventual arrival at the EEC.

It is important to note that new melodic material *is not* a requirement of S. In fact, many sonatas – especially those composed by Haydn – have S themes that resemble the P theme. (These are called mono-thematic sonatas.)

Closing module (C)

The definitive characteristics of C are that it follows the EEC, and that it is not S. C modules can present wholly new thematic material, or they can borrow from P or TR. They cannot, by definition, be S-based, since that would be a continuation of S. (Keep in mind that the EEC must go on to new material, otherwise the S module continues and the EEC has not been reached yet.)

The C module will always be in the secondary key. It is post-cadential, and the harmonic goal of the exposition has already been reached. If C goes somewhere else, it is not C.

Retransition (RT)

A retransition is like a *turnaround* in pop/rock or blues music. It is a dominant chord or arrival in the home key that prepares the return to the home key at the beginning of the repeat of the exposition. The difference between an RT and a turnaround is that an RT follows a modulation. When the RT follows a secondary key of V, it turns I in the key of V into V into the key of I by repetition, melodic figuration, or the adding of a chordal seventh.

5.5: Sonata Form - The Recapitulation

The *recapitulation* is the goal of the sonata, coming after the *exposition* and the *development* (anything that precedes the exposition is *introduction* and anything that follows the recapitulation is *coda*). It answers the expectations set forth by the exposition, and it brings the *essential sonata closure*. Thus, the relationship between the exposition and the recapitulation is the a central focus of a sonata analysis.

In light of the importance of this relationship, an analysis of a recapitulation should always take place in light of the exposition.

Thematic cycle

The recapitulation typically follows the same pattern of modules set forth in the exposition: { P TR ’ S / C } for a two-part exposition, { P TR ⇒ FS / C } for a continuous exposition (the apostrophe stands for the MC, the slash stands for the EEC/ESC).

Essential sonata closure

The harmonic goal of the recapitulation (and the sonata movement as a whole) is the *essential sonata closure (ESC)*. The ESC will always be a I:PAC, and will typically occur at the same thematic point in the recapitulation as the EEC in the exposition. It is often the exact same music as in the exposition, but transposed from the secondary key to the home key.

Recomposition

The simplest exposition–recapitulation relationship occurs in a sonata with a I:HC MC in the exposition followed immediately by S in the dominant. In such a sonata, the composer can simply repeat P–TR verbatim in the recapitulation, and then repeat S–C verbatim, but transposed down a fifth. In such a sonata, there is no recomposition. Every bar in the recapitulation directly corresponds to a bar in the exposition, at pitch or tranposed by fifth.

In most sonatas, however, some music from the exposition is *recomposed* in the recapitulation, often to “undo” the modulation that happened on the way to a V:HC MC. In such cases, we use the term *correspondence bars* (or *correspondence measures*) to refer to the passages that are the same (or the same transposed) in the exposition and the recapitulation. *Referential bars* make clear reference to specific bars in the exposition, but the material is changed in some non-trivial way. *Alterations* are passages in the recapitulation that have no clear reference or correspondence to passages in the exposition.

Correspondence, reference, and altered material tends to happen in the following order in the recapitulation:

- correspondence bars (P and perhaps the beginning of TR or TR ⇒ FS)
- alterations or referential bars (primarily in TR or TR ⇒ FS)
- correspondence bars (S and C, and sometimes the material immediately preceding the MC, transposed to the home key)

Crux

The point in the recapitulation at which alterations give way to renewed correspondence with the exposition is called the *crux*. This point, along with the MC and the ESC, must be determined before most of the rest of the analysis of the recapitulation can take place. Generally speaking, the crux will come before the beginning of S, with S and C comprised primarily of *correspondence bars*.

Typically there are no alterations *post-crux*, but when there are, they should not be overlooked in an analysis.

Hermeneutics

A sonata analysis only *begins* with the finding and labeling of these modules, keys, and events. Once you have successfully analyzed the sonata structure, move into interpretation (the scholarly term for the study of musical or textual interpretation is *hermeneutics*). Sonata hermeneutics begins with interpretive questions like:

- What expectations does the exposition set up for the recapitulation (and other passages such as the development and, if present, coda)?
- How does the recapitulation fulfill those expectations?
- How does the recapitulation thwart or mess with those expectations?

- What effects might the expected and unexpected elements in the recapitulation have on listeners?
- How do the unique elements of the piece in question relate to other pieces in its historical context?

When writing, presenting, or discussing a sonata analysis, don't simply catalog structure. Begin with questions like these, and provide structural details only in service of explaining your answers to those questions (and others that are raised by your engagement with the piece).

5.6: Sonata Form - The Development

The development section, the second large-scale section of a sonata form, succeeds the exposition's second part. It is by far the least conventional section of the sonata. Its relatively unstable tonal and phrase-structural characteristics motivate the return to stability in the recapitulation.

That said, developments should not be understood as completely unstructured or lacking conventional schematic routines. When analyzing a development section, you should keep track of at least three types of organization, outlined below. Rarely will a development section follow these models of organization precisely. Rather, you should treat them as heuristic tools to help reveal the individuality of a composition.

Tonal organization

Development sections tend to explore subordinate keys, and especially those in the minor mode. A major key sonata will often explore the submediant, mediant, and supertonic are in the development, while a minor key development will often touch upon the subdominant and minor dominant.

Most development sections do not confirm these keys through authentic cadences, as is typical in the rest of the sonata. More often these keys are confirmed by an HC.

Near its end, a development section quite often reaches a HC in the tonic key to prepare the recapitulation. That HC is often prolonged through a "standing on the dominant"—a module we will call the "retransition."

Thematic organization

There is no single standard order in which themes are presented in the development. In theory, a composer may touch on any of the themes that were part of the exposition's thematic cycle, or even introduce new themes.

However, some thematic layouts are more common than others. Developments that are based on P and TR are far more common than those based on S and C.

As a first principle, you should analyze a development in reference to the thematic cycle of the exposition (P-TR-S-C), realizing that leaving out some exposition modules is typical.

Four modules

There are generally four modules available to a development, and not all of them will necessarily be present in a given work, though they do proceed in the order shown below. The tonal and thematic layout of a development is grafted onto these modules in a variety of ways:

(1) Optional link from the preceding retransition or the closing material. This has the feeling of preceding the "development proper."

(2) Entry or preparation zone: Usually preparatory, often anticipatory, in a *piano* dynamic. Often P-based, but other options are possible.

(3) **Central-action zone: This is the "core" of the development and usually projects a mood of restlessness and instability. In fact, the musical techniques most associated with this section are those also associated with continuation function: sequence and fragmentation especially. The CAZ may unfold in a number of sections, which are separated by cadences.

When analyzing the CAZ you should be particularly attentive of sequence technique, in particular the D2 and A2 sequences. Most often a CAZ will establish a 2-, 4-, or 8-bar "model" that is sequenced any number of times. This model may make use of motivic material from the expositional rotation or new material.

Following a passage of fragmentation, a CAZ concludes with a HC in the tonic key.

(4) Retransition: This follows the HC. Most often it contains a "standing on the dominant" and motivically may foreshadow the primary theme in order to build anticipation for the recapitulation.

5.7: Sonata Form - Framing Modules (Introduction and Coda)

The *grammar* of a sonata — the basic harmonic and thematic story that anchors the formal style — is accomplished largely in the exposition, development, and especially the recapitulation. Of course, sonata-form movements typically have other narratives to tell musically, and the bigger the story, the more care composers take to hold it all together.

Larger sonata movements tend to have one or more framing modules: either an *introduction*, a *coda*, or both. These help to "frame" the big picture, and to create a coherent musical narrative — often an arc that builds in tension to a climax and resolves to a point of relative rest by the end of the movement.

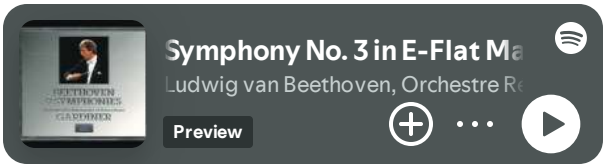
Some common characteristics of these modules are provided below, many of which are shared with introductions and codas in pop/rock music.

Introduction

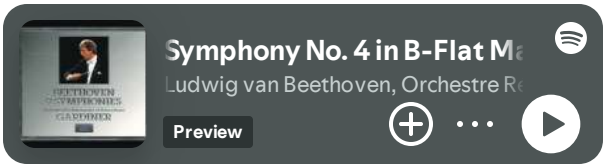
An introduction is any material that precedes the primary theme zone (P). It stands *outside* the exposition. If the exposition is repeated, the introduction is not repeated with it. Thus, a composer's open repeat sign **||:** in the score can be an important visual clue in identifying the end of an introduction and the beginning of an exposition. Because the introduction is not part of the exposition, it is not repeated in the recapitulation. Thus, even without repeats in a score or a performance, once the thematic cycle of the exposition, development, and recapitulation has been identified, the introduction can be identified as music that precedes the first occurrence of that cycle. Finally, though introductory material may be referenced later in the sonata, the introductory module only occurs once in a standard sonata movement (unlike a pop/rock introduction).

Introduction types

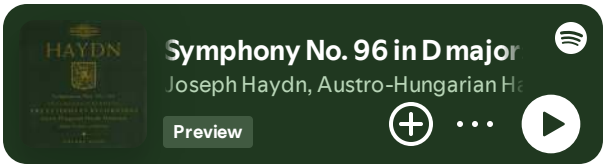
Introductions can be very brief, including simply one, two, or three *forte* chords from the orchestra as a simple "call to attention." The opening two chords of Beethoven's "Eroica" symphony are an example of this brief introduction.



Longer introductions often provide a slow contrast to a lively P theme. These slow introductions sometimes emphasize the parallel minor mode to prepare a major-key P theme. They typically end with a half cadence or other strong dominant arrival to generate anticipation of the tonic-emphasizing P theme that follows. The composer may *stand on the dominant* for some time to increase that anticipation. An example that does all of these things would be the introduction to Beethoven's fourth symphony (0:00–2:36 in the following recording).



Haydn's Symphony 96 ("Miracle") exemplifies the same traits (0:00–1:30 in the recording below).



Coda

A coda is a new module that follows the end of the recapitulation's thematic cycle. In other words, once the harmonic work of the recapitulation has been accomplished (the arrival of the **I:PAC ESC**) and the basic themes of the exposition have been presented

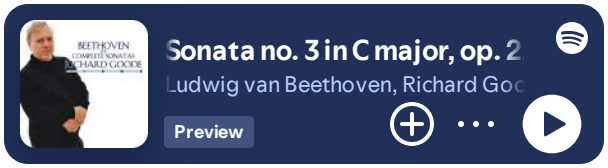
(such as **P TR S C**), new material tends to fall into the coda module.

Like the introduction, the coda sits outside the recapitulation. Thus, if the development and recapitulation are repeated (more often in the score than in modern performances), the coda will come after the final repeat. Without a clear repeat mark in the score, codas are primarily identified by their coming after the end of the thematic material being recapitulated.

There is one common exception: often a codetta from the exposition will be expanded in the recapitulation to make a stronger ending punctuation to close the movement. What distinguishes a coda from a codetta is that a codetta is a post-cadential extension of the final cadence of the exposition/recapitulation. A coda *does something more* — harmonically, such as visiting a new key; or melodically, such as introducing a new theme or revisiting earlier material such as P or the development.

One can compare the codetta–coda relationship to the postchorus–coda relationship in pop/rock music. A codetta or postchorus simply rounds out the ending of a cycle, making its finality clear. A coda makes a notable melodic or harmonic move in order to do something more novel and significant.

An example coda would be at the end of Beethoven's Piano Sonata in C Major, Op. 2, No. 3, first movement (beginning at 8:29 in the recording below). The recapitulation completes its **P TR? S? TR S C** cycle. After a shortened version of C, though, a deceptive resolution of the dominant chord leads to an excursion in A-flat major (flat-VI) involving new melodic material. After a harmonic sequence, Beethoven brings back the opening of the P theme in C major, followed by a bombastic, definitive end to the movement. The new melody, the new key area, and the use of a substantial portion of P, all contribute to its coda-ness — and make a codetta interpretation difficult to sustain.



While the coda sits outside the definitive sonata structure, it often plays an important role rhetorically in the movement. For example, since flat-VI is a closely related key in minor, the flat-VI emphasis in Op. 2/3 could be seen as rounding out a bigger tonal story. Beethoven visits minor-V in the exposition and minor-I in the recapitulation as part of the double-MC form. The coda in flat-VI (closely related to minor-I) could be interpreted as rounding off that story — one that comes alongside the normal sonata-form story, but is not part of it. Other times codas may simply allow a composer to extend the resolution of tension built up in a long movement, or complete work begun but not finished during a development section.

Whatever the case, it is important to remember that while what happens in the exposition and recapitulation "makes a sonata a sonata," what happens in these framing modules (and the development) often defines what is special about one sonata in particular. A complete analysis engages both the normative and the deviant, the grammatical and the rhetorical.

5.8: Rondo Form - Introduction

Like sonata form, rondo forms have a long history. Where sonata emanates from Baroque dance movements (coming mostly from Italy), rondo has a longer history whose origins are in a French instrumental genre—the rondeaux—that was characterized by an alternation of refrains and contrasting couplets. Within an instrumental sonata or symphonic work, rondos are generally found in fast finales or in slow second movements. Probably because rondos are lighter in character, they are almost never found as a first movement.

Conceptually, rondo is quite simple. The form consists of refrains that alternate with episodes. The refrain material is *the same* throughout the course of a movement—sometimes slightly embellished or abbreviated—and is always heard in the tonic key. Episodes contrast with refrains tonally, and usually thematically as well. Unlike refrains, a rondo's episodes do not have to be the same in the course of a movement. So on a large scale, a typical rondo will articulate an ABAC … A form; A stands for refrain, B and C indicate episodes containing unique thematic material. The ellipsis mark (…) indicates that the precise number of refrains and episodes is variable, though the 5-part (ABACA) rondo is certainly the most common.

Though conceptually simple, in practice, rondo may be the most difficult form to describe theoretically and engage with analytically. This is primarily because different composers used the simple rondo schematic above in different ways. To help you manage these deviations, we will classify rondos into two types: (1) five-part rondo (ABACA), and (2) sonata rondo (ABACABA). The primary difference between the types, which we will discuss in more detail in the other rondo resources,is that in a sonata rondo, the first refrain and first episode constitute a complete sonata exposition that is recapitulated (with the episode transposed to the tonic key) in the third refrain and episode. Learning to recognize the types of thematic function most common in rondo forms is an important first step.

5.9: Rondo Form - Thematic Function in Rondo Form

Rondos are characterized by the alternation of *refrains* and *episodes*. Each return of the refrain is in the tonic key, and presents the same melodic/motivic material, while episodes contrast melodically and tonally.

Refrains are generally simple, tight-knit themes that end with a PAC in the tonic key. Thematically, a rondo's refrain is most commonly constructed in one of two ways: (1) as a simple (usually tight-knit, often periodic) theme type, or (2) as a rounded binary.

If the refrain is a rounded binary, it is common for it to be abridged when returning later in the movement.

Episodes, by contrast, are usually in contrasting keys and feature contrasting melodic/motivic material. Though not always the case, it is most common for the episodes that contrast with refrains to be more complex in construction than refrains. Dramatizing the return to the refrain is an important part of the rondo aesthetic, and the thematic and harmonic complexity associated with rondo episodes forms an important part of that goal.

We distinguish between two types of episodic material: (1) interior themes, and (2) second-theme complexes. Because of the greater complexity, these two types of refrain are explored in more detail below.

Interior Theme

Interior themes are the simplest type of episode. Thematically and tonally, they resemble a Minuet's Trio.

Tonality: An interior theme contrasts modally or tonally with the refrain. Much of the time, the interior theme is "*minore*," meaning that the tonic does not change from refrain to episode, but the mode does. (In a minor-key rondo, the first episode might be "*maggiore*.")

Formal structure: An interior theme is usually a rounded binary, or one of the other binary types. Sometimes, the binary organization is shown with repeat signs in the score, though occasionally the repeats are "written out." Though by no means obligatory, an interior theme can be followed by a *retransition* that leads to the home key's dominant.

**Complications: **The primary complication for analysis is that interior themes are often left *incomplete* formally. Be on the look out for these two deviations;

1. Following a contrasting middle section, the recapitulation may not return. Thus, such an episode might be structured as AAB followed by a retransition.
2. The recapitulation may return but not lead to a PAC, instead merging into a retransition section.

Second-Theme Complex

A second-theme complex resembles—but is not always identical to—the TR, S, CL, and RT zones of the classical sonata. In a major key, the episode will modulate to the dominant (V). In a minor key, the major mediant (III) is more common.

Formal structure: We will outline the prototypical form first, though as indicated below, you must approach this section flexibly. Following the first refrain's close, a transition phrase (TR) begins the episode by modulating to a subordinate key through a pivot-chord modulation. The secondary theme (S) follows, confirming the new key with a PAC. Then, closing (CL) is heard and merges into a retransition (RT) that leads back to the refrain.

Complications: Though it resembles features of a sonata exposition, a rondo's second-theme complex engages many more possibilities. TR and CL may not appear, for example, and the second-theme complex may not have a PAC in the subordinate key. Thematic function is much looser here than in the refrain. Here are the primary complications:

1. **TR merges => into S:** Following the PAC that ended the refrain, a TR phrase begins and initiates a modulation. However, after modulating the same phrase confirms the subordinate key with a PAC. In this situation, the single phrase is understood to express both TR and S function. This is very much like the TR=>S merger that we find in the exposition of a Minuet/Trio form.
2. **No TR appear:** Following the PAC that ended the refrain, S appears with no intervening TR. In this case, a direct modulation has occurred.
3. **S does not lead to a PAC, but merges => into a retransition (RT)**: Typically, the episodes S theme will lead to a PAC that confirms the subordinate key. In this case, the cadence never materializes. Instead, the music more or less seamlessly becomes a

retransition, S=>RT.

Analytical Tips:

Cadential structure is *absolutely necessary* to determining a theme's function. This is even more the case with the rondo's second-theme complex. Here are some analytical tips, oriented around cadential structure, that you should use to guide your analysis.

1. S themes begin in a subordinate key, end with a PAC in a subordinate key, or both. That is, a phrase that ends with a PAC in the subordinate key expresses S function even if the phrase did not begin in the subordinate key, and vice versa.
2. TR function is given to phrases that modulate. When TR doesn't merge with S, it usually ends with a HC in the subordinate key.
3. CL function follows a PAC in the subordinate key.
4. RT usually contains a I:HC, optionally followed by "standing on the dominant."

5.10: Rondo Form - Five-Part Rondo Form

A five-part rondo contains three refrains separated by two episodes: ABACA. (We will occasionally use these short-hand letter designations (A, B, and so on) to label rondos, but get in the habit of labeling the sections as “Refrain 1,” “Refrain 2,” “Episode 1,” etc., to avoid ambiguity with lower-level, embedded forms.)

The episodes of a five-part rondo are interior themes or second-theme complexes. It is more common to find a second-theme complex in Episode 1 than it is to find one in Episode 2. Often, the returns of the refrain are ornamented or abridged.

The older *rondeau*, from which this formal type derives, could feature many more refrains and episodes. Occasionally, therefore, you will find a seven-, or even nine-part rondo in the classical style.

5.11: Rondo Form - Sonata Rondo

A sonata rondo (ABACABA) features the same refrain-episode alternation that we find in the five-part rondo, but certain aspects of sonata form are infiltrate this alternation.

Exposition Development Recapitulation

Refrain 1 Episode 1 Refrain 2 Episode 2 Refrain 3 Episode 3 Refrain 4

1. Refrain 1 and Episode 1 form a sonata exposition that is recapitulated in Refrain 3 and Episode 3. As is the case in sonata form, the recapitulation contains a “tonal adjustment” so that it ends in the tonic key. That is, Episode 1 and 3 will be the same thematically, but Episode 3 will occur in tonic.
2. Because it resembles sonata form, the first and third episodes are always constructed as “second-theme” complexes.
3. Episode 2 (C in the short-hand diagram above) may be a development—possibly containing a prep-zone, CAZ, and retransition—or it may be a simpler interior theme.

5.12: Other Formal Structures in the Classical Style - Minuet Form

A classical minuet movement typically contains a *main minuet*, followed by a *trio, _followed by a _da capo* repeat of the main minuet (usually performed without taking the repeats). The movement, then, has a large-scale ABA' form: *minuet–trio–minuet da capo*.

Both the main minuet and the trio tend to be *small ternary* structures. Like the minuet/trio movement itself, the small ternary form follows an ABA' structure. However, the small ternary structure found in the typical *main minuet* is of the *rounded binary* type. That is, while there are three distinct modules—A, B, and A'—they are grouped into two larger sections, each of which is repeated.

The first part in the two-part structure is the *first reprise*, and the second part is the *second reprise*, so called because they each repeat. The first reprise contains the A module of the minuet; the second contains the B and the A' modules.

Each section of the minuet's (or the trio's) small ternary form has its own formal function attached to it. The formal function exhibited in the A section is called *exposition* function; the B section *contrasting middle* function ; and the A' section *recapitulation* function.

Exposition

At the least, the exposition module of the minuet typically contains a primary theme: tight-knit (period, sentence, or hybrid), ending with a PAC, or occasionally a HC. It is common, however, for an exposition to have more complex structure, projecting not just primary theme, but secondary thematic function, transition, and closing. Not all of these functions are necessarily present.

Primary Theme

Expositions always have a *primary themes*. A prototypical *primary theme* is (1) tight-knit and (2) ends with a PAC or HC in the tonic key. When an exposition does not modulate, it is understood to exclusively express *primary theme* function.

Secondary Theme

But if the exposition modulates, the functions of *transition*, and *secondary theme* may appear as well. At minimum a *secondary theme* will close with cadential confirmation (usually a PAC) of the subordinate key. Often, it is looser than the main theme—perhaps expanded or contracted.

Transition

If a phrase contains a [pivot chord modulation][modulation.html] linking the main key to the subordinate key, that phrase is understood to express *transition* function. (If a new phrase begins immediately in the subordinate key through [direct modulation][modulation.html], there is no transition function.)

Very, very often the transition and the secondary theme are "fused" together (TR==>S) in a single phrase.

Closing Section

Sometimes the secondary theme closes with a PAC and is followed by a closing section.

Contrasting Middle

A contrasting middle section is significantly looser than the exposition. Though it may contain some kind of thematic structure (sentence, primarily), it often does not. Sequences and remote tonal areas are quite typical of the digression section. When doing analysis, your goal should be to identify the melodic/motivic material and understand the tonal structure.

Contrasting middle passages end with a I:HC, creating a harmonic interruption. Commonly, the I:HC is followed by a post-cadential "[standing on the dominant][externalExpansions.html]."

Recapitulation

The definitive characteristics of a minuet's *recapitulation* function are (1) the *return of the basic idea* from the A section at its beginning, (2) the *return of the home key* at its beginning, and (3) a final PAC in the home key.

A recapitulation typically copies the thematic and phrase-structural features of the exposition, but altering the secondary theme so as to end in tonic. Commonly, the recapitulation *expands* the exposition's closing phrase.

Trio

Like the minuet, a trio is typically a rounded or simple binary form. It's primary job is to establish melodic and harmonic contrast. While contrasting tonally with the *main minuet* is a central feature of the Trio, Trio's often simply projection modal contrast. When the tonic stays the same, a major-key *main minuet* might be contrasted with a Trio marked *minore*. (The corresponding situation for a minor-key *main minuet* is a *maggiore* Trio.)

5.13: Galant Schemata - Opens and Closes

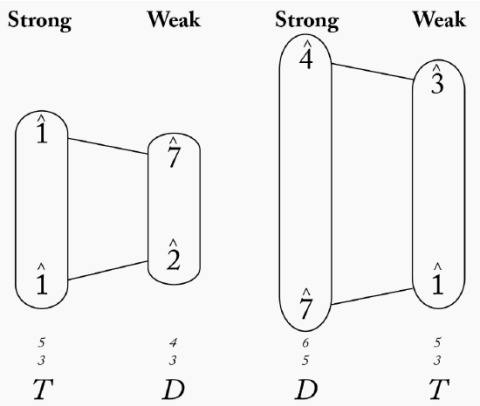
Schemata (pl. of schema) are “stock musical phrases” (Gjerdingen 2007, p. 6) that act as melodic, harmonic, and rhythmic/metric skeletons for passages of music in the Galant style. We can apply the term *schema* in three specific ways. First, a schema is a *prototype*—an idealized version of a common pattern. Second, a schema can be an *exemplar*—a single pattern that resembles the prototype. Third, a schema can be a *theory*—an explanation of a commonly occurring musical event. All of these ideas go into how we understand schemata. We understand an individual pattern (exemplar) as a version of an ideal general pattern (prototype), and that relationship helps us understand how that pattern is functioning within a particular passage of music (theory).

Schemata are often give names, sometimes based on descriptions from earlier theorists (“Monte, Fonte, Ponte,” were described by Joseph Riepel) or at other times, named after theorists themselves (“Meyer” is named after Leonard Meyer).

Schemata have both *internal defining characteristics* and *normative placements* within a series of musical events. Internal characteristics describe a schema’s (1) melodic features—shown with scale degrees; (2) harmonic features—shown with figured bass, and (3) metric features—indicating whether a “stage” in the schema occurs in a weak or strong metric position. A schema’s normative placement describes it temporal location. For example, an “opening gambit” such as the “Meyer” is associated with the *beginning* of theme, perhaps constituting the whole of the presentation phrase or of a basic idea. A closing “riposte” like the “Prinner” is used as closing gesture.

##Opening Gambits##

###“The Meyer”###



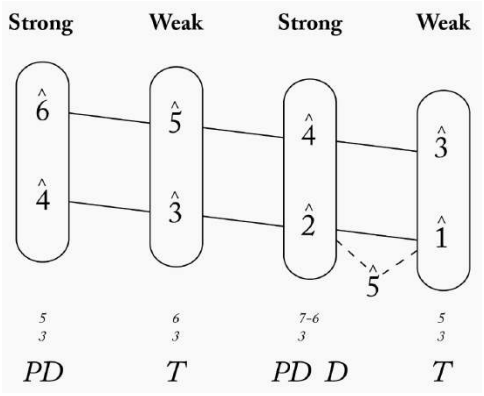
A Meyer is archetypal”opening” schema in the galant style that prolongs the tonic contrapuntally. It begins and closes on a tonic chord, with non-tonic sonorities occuring in the middle two stages. Because the Meyer closes with mi/me in the top voice, it is not so strong as to imply the finality we associate with a cadence. So it works well at the beginning of a theme. This melodic skeleton is the most important feature of the Meyer, and occurs invariably even when the bass is somewhat altered.

When each sonority receives one “measure” of music, it is commonly found in the presentation or antecedent part of an opening theme. If those stages occur at the rate of two per measure, the Meyer may form a basic idea that would be followed by a closing gesture, such as the “Prinner” described below.

A fairly exhaustive list of opening schemata can be found on the Galant schemata – summary page. Many of them follow the same general pattern as the Meyer. For example, “The Pastorella,” “The Jupiter,” and “The Aprile,” all prolong tonic by moving away for the two middle stages before a tonic return. Like the Meyer, they are ideal prototypes for the first phrase of an opening theme. As with the Meyer, the bass and harmonic structure are less fixed than is the melody. The two central stages may articulate dominant harmony in all three schemas, and the second stage is also commonly accompanied by predominant harmony.

##Closing gestures##

###“The Prinner”###



The Prinner is a typical response to an opening schema. It often occurs in a sentence (or a hybrid theme type) as the continuation phrase. Or if the harmonic rhythm is quicker, it may be used as the basis for a constrasting idea in an antecedent or consequent phrase.

The Prinner has four stages corresponding to four bass notes: fa –mi/me – re – do. The skeleton of the Prinner's melody typically accompanies the bass in parallel tenths: la/le – sol – fa – mi/me. Harmonically, the fa and do bass notes tend to take 5/3 chords while the two middle bass notes, mi/me and re, take 6/3 chords.

Some Prinner exemplars insert a sol bass note before the last chord, resulting in an authentic cadence. Prinners that operate as continuation phrases often contain this move in order to end the sentence or hybrid theme satisfactorily.

To complete a modulation to the dominant, the Prinner schema can be transposed up a fifth. When this occurs, the first stage of the Prinner (the 5/3 chord on fa) is the tonic of the home key and the subdominant of the dominant key, making a particularly smooth transition. Modulating Prinners are used in sentence or hybrid themes either to modulate to the dominant key or to effect a strong half cadence. They also commonly appear at the beginning of the Transition (TR) zone in a sonata movement, effecting the same move to the dominant.

For more continuation/cadential schemata, see the Galant schemata – summary page.

References

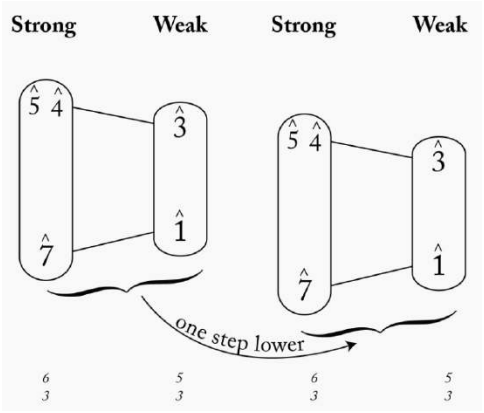
Gjerdingen, Robert O. *Music in the Galant Style*. Oxford University Press, 2007.

5.14: Galant Schemata - Continuation Patterns

The three schema below were described first by the eighteenth-century theorist Joseph Riepel. They are "continuation patterns", often found after the first double bar in a minuet. The "Fonte" and "Monte" are both sequential, the "Ponte" is a way of extending a harmony.

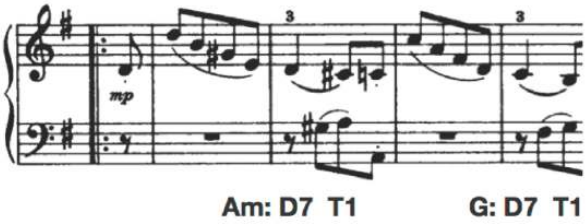
Fonte

A *Fonte* (It. for "fountain" or "well"—think *going down*) is a common pattern to begin the *contrasting middle* of a small ternary form. In other words, it follows the double-bar in a minuet, minuet trio, or rounded-binary theme. A Fonte is a *model/sequence* schema: a two-bar pattern is immediately repeated one step lower than the original.



Harmonically, the first two-bar unit (the *model*) contains two chords, one per bar: an applied dominant chord, and the tonicized chord to which the applied dominant points. The most common chord pattern for the Fonte's model is **D7/II T1/II** *of the home key*, with the **D7** being a chord of the sixth and the **T1** being a chord of the fifth. (Other "inversions" are possible, such as **D4/II T3/II**.) When the model composes out **D7/II II**, the sequence will transpose it down to tonic: **D7 T1** *of the home key*.

As an example, the functional-bass analysis of a typical Fonte in a small ternary whose home key is G major looks like:



Note the non-cadential progressions, **D7–T1**. Normally such progressions would need to be interpreted as prolonging a tonal function (i.e., tonic function), which would be difficult to interpret here. Schemata often contain such progressions. Simply analyze the chords individually and label the schema, rather than trying to interpret these progressions as prolongational. (Indeed, they are not.)

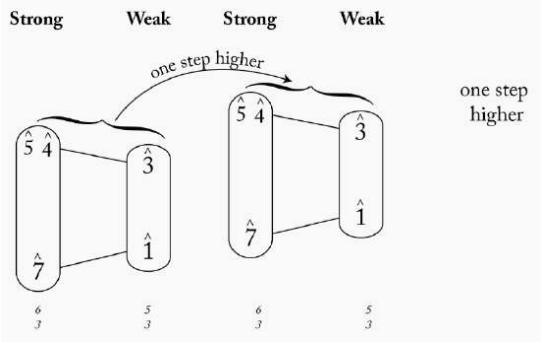
A common model for a minuet containing a Fonte is as follows:

: EXPOSITION ending with V:PAC :	: Fonte - phrase ending with I:HC – RECAPITULATION :

The Fonte is a quick and easy way for a composer to transition from the key of the dominant (where a major-key minuet's exposition cadences immediately before the double-bar) to the key of the tonic. It will usually be followed by a phrase that stands on or moves to the dominant of the home key. The half cadence or *dominant arrival* at the end of that phrase will prepare for the return to the opening material in the home key, the *recapitulation* of the minuet or small ternary.

Monte

A *Monte* (It. for “mountain”—think *going up*) functions similarly to a Fonte. It typically occurs as part of the *contrasting middle* section of a minuet or other small ternary, it is a model/sequence schema, and it involves an applied chord resolving to a tonicized chord—typically a **D7 T1** pattern. The difference is that where a Fonte goes *down* (**D7/II T1/II D7 T1**), a Monte goes *up* (**D7/IV T1/IV D7/V T1/V**). And where a Fonte is almost exclusively four bars long (one model followed by one transposed repetition), a Monte sometimes extends to six or more bars (one model followed by one *or more* transposed repetitions).



Ponte

A *Ponte* (It. for “bridge”) was another common schema for the *contrasting middle* of a minuet. Unlike the Fonte and the Monte, the Ponte need not be a model/sequence schema. It effects *delay* rather than *motion*. A Ponte typically functions like what Caplin calls *standing on the dominant*. The exposition of the major-key minuet will end with a PAC in the dominant of the home key. When a Ponte follows that cadence, it holds onto that **T1/V**, heightens tension melodically, and often adds a seventh to the chord (making it D5 of the home key). A passage built on a Ponte does not have a cadence, since there is no harmonic progression, but instead ends with a punctuated dominant chord in the home key, which Caplin calls a *dominant arrival* rather than a half cadence. This dominant arrival prepares the return of the home key and the opening basic idea that come at the minuet’s recapitulation.

References

Caplin, William. *Classical Form*. Oxford University Press, 2000.

Gjerdingen, Robert O. *Music in the Galant Style*. Oxford University Press, 2007.

5.15: Galant Schemata - Summary

Openings (presentations)

The following schemata tend to appear at the opening of themes, often as the framework for a presentation phrase in a sentence.

*Note: though these schemata are presented in major mode, most of these can be converted directly to minor mode.

The Meyer

STAGE:	1	2	3	4
melody:	*do*	*ti*	*fa*	*mi*
bass:	*do*	*re*	*ti*	*do*
thoroughbass:	5/3	4/3	6/5	5/3
Roman numerals:	I	V	V	I
functions:	T	D	D	T

The Jupiter

STAGE:	1	2	3	4
melody:	*do*	*re*	*fa*	*mi*
bass:	*do*	*ti*	*ti*	*do*
thoroughbass:	5/3	6/5	6/5	5/3
Roman numerals:	I	V	V	I
functions:	T	D	D	T

or

STAGE:	1	2	3	4
melody:	*do*	*re*	*fa*	*mi*
bass:	*do*	*sol*	*sol*	*do*
thoroughbass:	5/3	7	7	5/3
Roman numerals:	I	V	V	I
functions:	T	D	D	T

The Aprile

STAGE:	1	2	3	4
melody:	*do*	*ti*	*re*	*do*
bass:	*do*	*re*	*ti*	*do*
thoroughbass:	5/3	4/3	6/5	5/3
Roman numerals:	I	V	V	I
functions:	T	D	D	T

The Pastorella

STAGE:	1	2	3	4
melody:	*mi*	*re*	*fa*	*mi*
bass:	*do*	*sol*	*sol*	*do*
thoroughbass:	5/3	7	7	5/3
Roman numerals:	I	V	V	I
functions:	T	D	D	T

The Do–Re–Mi

Though common in a three-stage version, this four-stage version is more typical when employed in a presentation phrase.

STAGE:	1	2	3	4
melody:	*do*	*re*	*re*	*mi*
bass:	*do*	*ti*	*ti*	*do*
thoroughbass:	5/3	6/5	6/5	5/3
Roman numerals:	I	V	V	I
functions:	T	D	D	T

(Root-position dominant chords may also be used.)

Sol–Fa–Mi

STAGE:	1	2	3	4
melody:	*sol*	*fa*	*fa*	*mi*
bass:	*do*	*re*	*ti*	*do*
thoroughbass:	5/3	5/3	6/5	5/3
Roman numerals:	I	II	V	I
functions:	T	S	D	T

or

STAGE:	1	2	3	4
melody:	*sol*	*fa*	*fa*	*mi*
bass:	*do*	*re*	*ti*	*do*
thoroughbass:	5/3	6/3	6/5	5/3
Roman numerals:	I	VII	V	I
functions:	T	D	D	T

The Romanesca

STAGE:	1	2	3	4
melody:	*sol*	*sol*	*do*	*sol*
bass:	*do*	*ti*	*la*	*mi*
thoroughbass:	5/3	6/3	5/3	6/3
Roman numerals:	I	V	VI	I
functions:	T	D	Tx	T

The melody of this schema is quite flexible. The bass/harmony are the more definitive elements. Also note that, in contrast to the other "presentation" schemata, this schema is far more common in slower movements.

Continuing schemata

The Prinner

STAGE:	1	2	3	4
melody:	*la*	*sol*	*fa*	*mi*
bass:	*fa*	*mi*	*re*	*do*
thoroughbass:	5/3	6/3	7–6/3	5/3
Roman numerals:	IV	I	VII	I
functions:	S	T	D	T

or

STAGE:	1	2	3	4	5
melody:	*la*	*sol*	*fa*	*fa*	*mi*
bass:	*fa*	*mi*	*re*	*sol*	*do*
thoroughbass:	5/3	6/3	7–6/3	7	5/3
Roman numerals:	IV	I	VII	V	I
functions:	S	T	D	D	T

The Modulating Prinner

This schema modulates from the tonic to the dominant. It is a common continuation phrase for a modulating sentence. It is also a common framework for a *tutti* passage that begins the transition module of a sonata/symphony movement.

STAGE:	1	2	3	4
melody:	*mi*	*re*	*do*	*ti*
bass:	*do*	*ti*	*la*	*sol*
thoroughbass:	5/3	6/3	7–#6/3	5/3
Roman numerals:	I	V	VII/V	V

or

STAGE:	1	2	3	4	5
melody:	*mi*	*re*	*do*	*do*	*ti*
bass:	*do*	*ti*	*la*	*re*	*sol*
thoroughbass:	5/3	6/3	7–#6/3	7/#	5/3
Roman numerals:	I	V	VII/V	V/V	V

The Passo Indietro

STAGE:	1	2
melody:	*la*	*sol*
bass:	*fa*	*mi*
thoroughbass:	5/3	6/3
Roman numerals:	IV	I
functions:	S	T

This is essentially the first two stages of a Prinner. The latter two stages are often elided (cut away) in order to make room for a cadence pattern.

Like the Prinner, the Passo Indietro has a "modulating version" (the first two stages of the Modulating Prinner).

STAGE:	1	2
melody:	*mi*	*re*
bass:	*do*	*ti*
thoroughbass:	5/3	6/3
Roman numerals:	I	V

Cadences

The Simple PAC

STAGE:	1	2
melody:	*re*	*do*
bass:	*sol*	*do*
thoroughbass:	(7)	5/3
Roman numerals:	V	I
functions:	D	T

The Simple IAC

STAGE:	1	2
melody:	*fa*	*mi*
bass:	*sol*	*do*
thoroughbass:	7	5/3
Roman numerals:	V	I
functions:	D	T

The fa–fi–sol HC

This is a common approach to a half cadence, especially at the end of a sonata movement's transition (TR) module. The definitive element is the bass line: *fa–fi–sol*. The *re–do–ti* melody is common, and the most active of the possibilities that fit the harmonies. See Mozart's K. 545, I., mm. 10–11, and K. 333, I., mm. 17–18, for examples.

STAGE:	1	2	3
melody:	*re*	*do*	*ti*
bass:	*fa*	*fi*	*sol*
thoroughbass:	6/3	6/5	(7)
Roman numerals:	II	V/V	V
functions:	S	S	D

The Compound PAC

STAGE:	1	2	3
melody:	*mi*	*re*	*do*
bass:	*sol*	*sol*	*do*
thoroughbass:	(8)/6/4	(7)	5/3
Roman numerals:	Cad.	V	I
functions:	D	D	T

The Compound IAC

STAGE:	1	2	3
melody:	*sol*	*fa*	*mi*
bass:	*sol*	*sol*	*do*
thoroughbass:	8/6/4	7	5/3
Roman numerals:	Cad.	V	I
functions:	D	D	T

The Compound HC

STAGE:	1	2
melody:	*mi*	*re*
bass:	*sol*	*sol*
thoroughbass:	6/4	5/3
Roman numerals:	Cad.	V
functions:	D	D

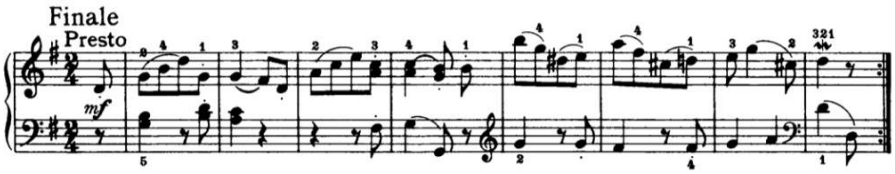
(The Compound HC can be approached by any **S** chord, or even the end of the tonic prolongational zone.)

There are, of course, more cadence patterns than these, but these are the most straightforward for framing an improvisation, or a simple model composition. See Classical cadence types for more details about standard cadential patterns.

5.16: Galant Schemata - Improvising a Sentence with Galant Schemata

The classical sentence lends itself well to *galant* schemata. In fact, we have labeled many of the schemata on our summary page as "presentation" or "continuation" schemata. Many four-stage schemata tend to appear with the melodic configuration common to the presentation phrase: a basic idea and its varied repetition.

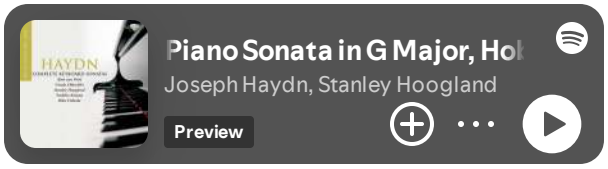
Take the opening theme from Haydn's Piano Sonata in G Major, Hob. XVI:27, third movement.



Public domain score excerpted from IMSLP. Click image to enlarge.

Bars 1–4 (the presentation phrase) give an embellishment of the Meyer schema. Note the two-bar basic idea that is repeated in mm. 3–4, transposed up a step (for the most part).

Bars 5–6 (beginning the continuation phrase) give an embellishment of the modulating Passo Indietro schema. This is followed by a $\mathbf{II^6\ V^7\ I}$ cadence in the key of the dominant. (Of course, it goes by so fast, it can easily sound like a half cadence in the home key.)

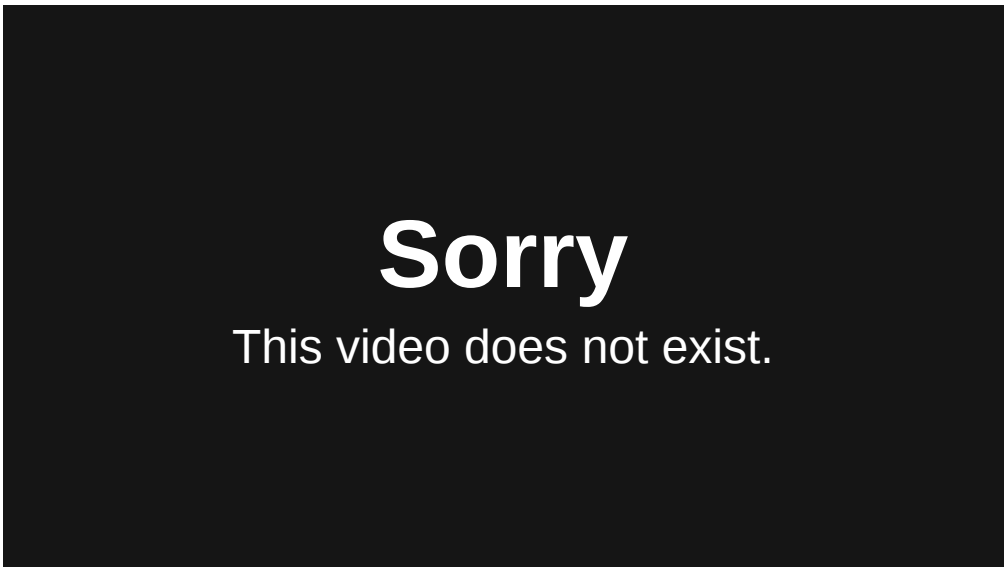


Our beginning improvisations will not be nearly as elaborate as Haydn's composition, but note a few features that are helpful to mimic:

- The Meyer's typical melody notes come on each downbeat (stage 1 – bar 1, etc.).
- The Meyer's typical melody notes for stages 1 and 3 also come at the end of the bar, immediately preceding their counterparts in bars 2 and 4.
- Though the harmonic rhythm remains the same, the switch from presentation schema to continuation schema is matched by a change from two-bar melodic "chunks" to one-bar melodic chunks. (This is the *fragmentation* that is common to continuation phrases.)
- The continuation phrase follows well from the presentation phrase rhythmically and harmonically, but there is no obvious motivic connection between the two phrases.
- The cadence is relatively formulaic.

In those ways, this theme is a model example for our simple improvisations: highlight the schema's typical melody notes on the downbeats and/or across the barline between mm. 1 and 2, mm. 3 and 4; use a more original melodic idea at the beginning and get more formulaic as you progress towards the final cadence; etc.

Following is a video that goes into more detail about tricky situations and specific techniques that may come up when using these schemata to improvise a sentence. This video focuses on the presentation phrase, using schemata like the Meyer or the Jupiter.



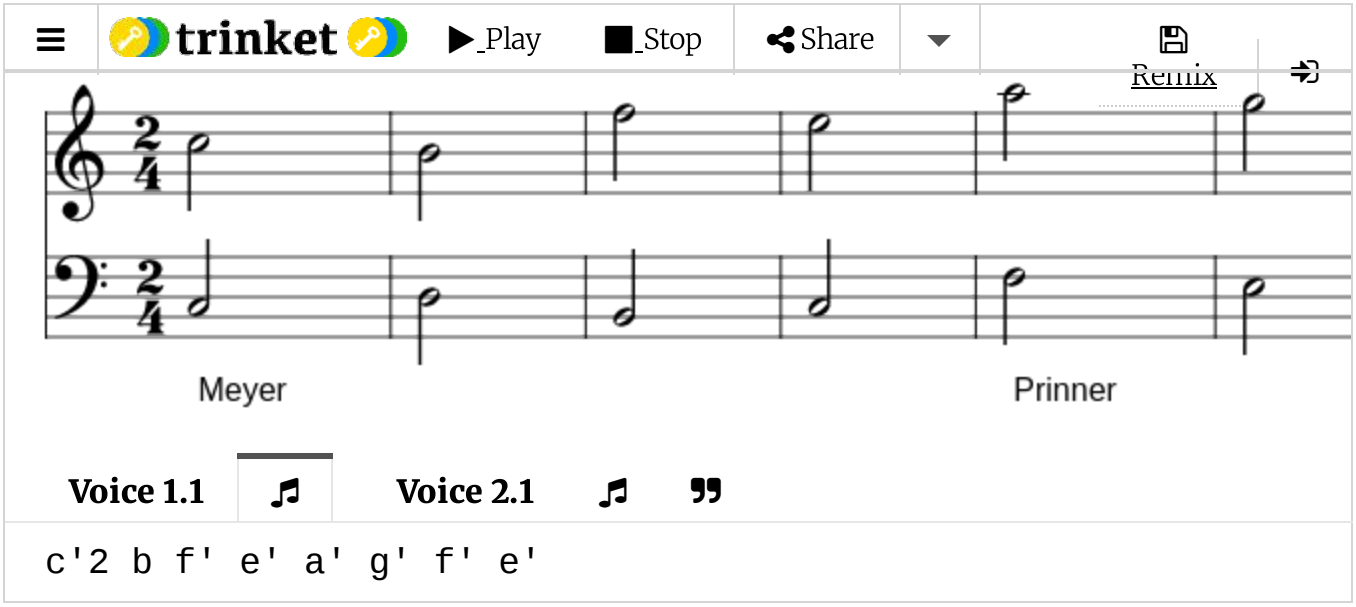
Improvising a presentation phrase on Vimeo.

Putting it together

The simplest way to build an entire sentence is to begin with one of the four-stage presentation schemata above, and then follow it with either a 5-stage Prinner (which ends on an IAC) or some kind of continuation–cadence combination. Following are a few examples. You can use these as skeletons upon which to base an improvisation, or you can embellish these interactive examples to try out composing a simple sentence. (See the Using Trinket page for details.)

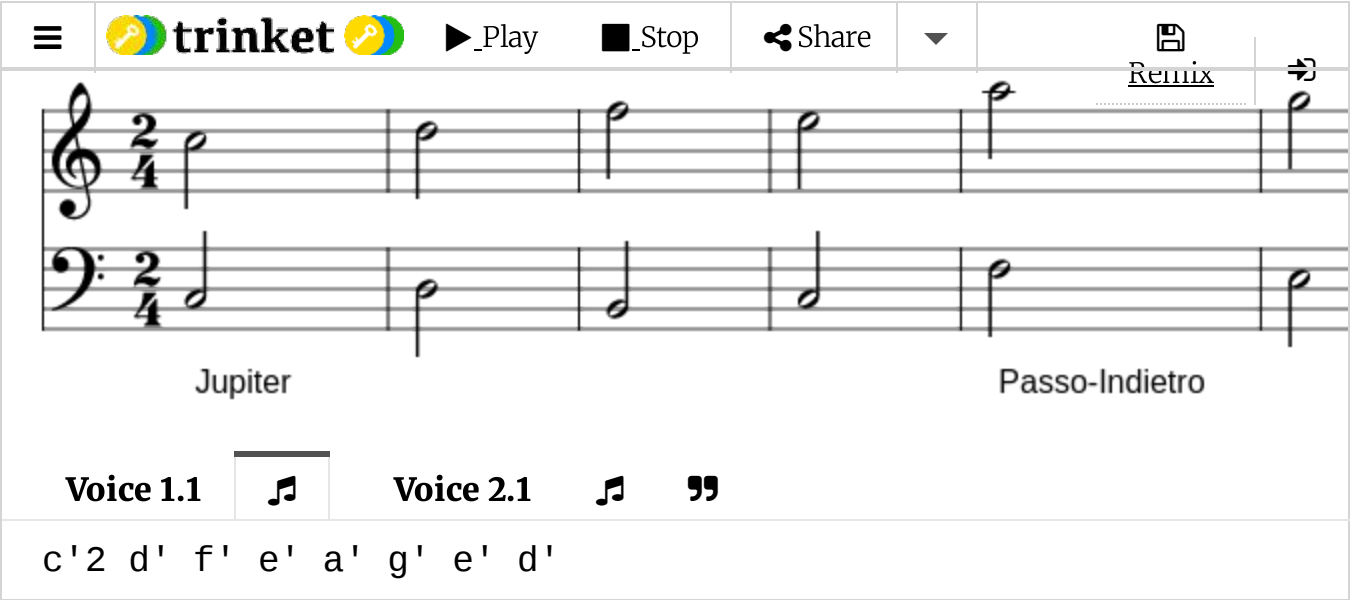
Presentation – 5-phase Prinner

The following framework begins with a Meyer and follows with a 5-stage Prinner. Note that stages 3 and 4 of the Prinner are compressed into a single bar in order to line up with the common 8-bar sentence length. Also note that any presentation schema can be substituted for the Meyer.

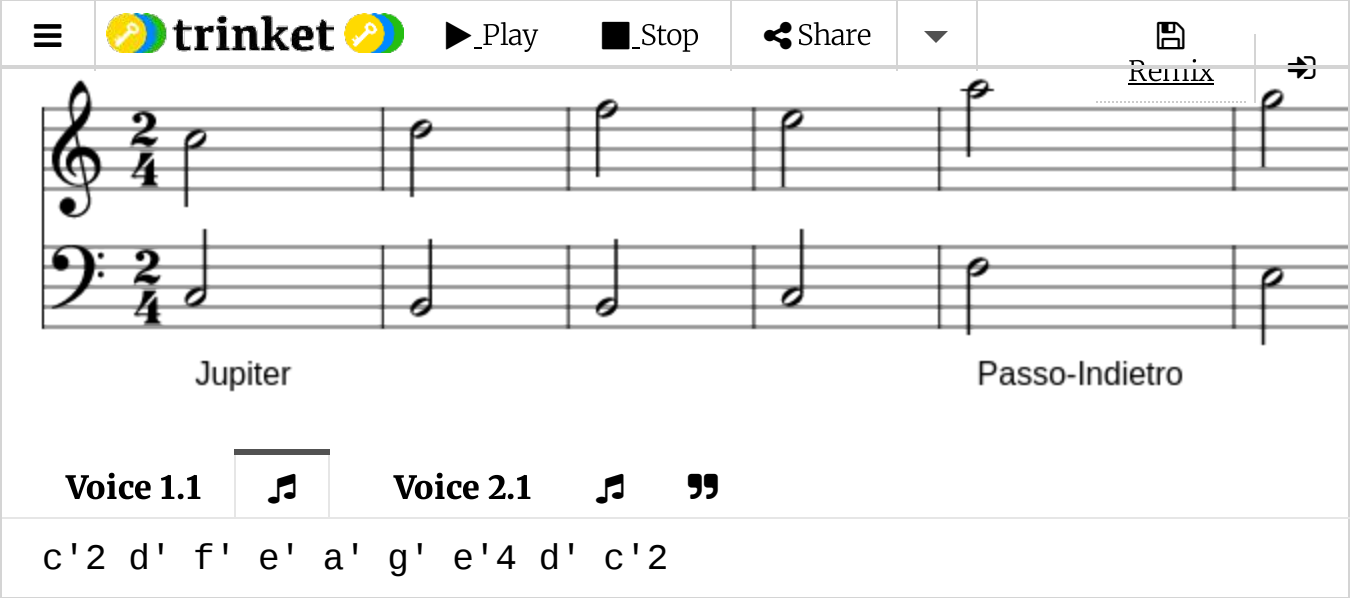


Presentation – Passo Indietro – Cadence

Often classical composers would begin a Prinner, and then truncate it to make room for the final cadence. The following example does this, beginning with a Jupiter and progressing through a Passo Indietro (a half-Prinner) to a Compound HC.



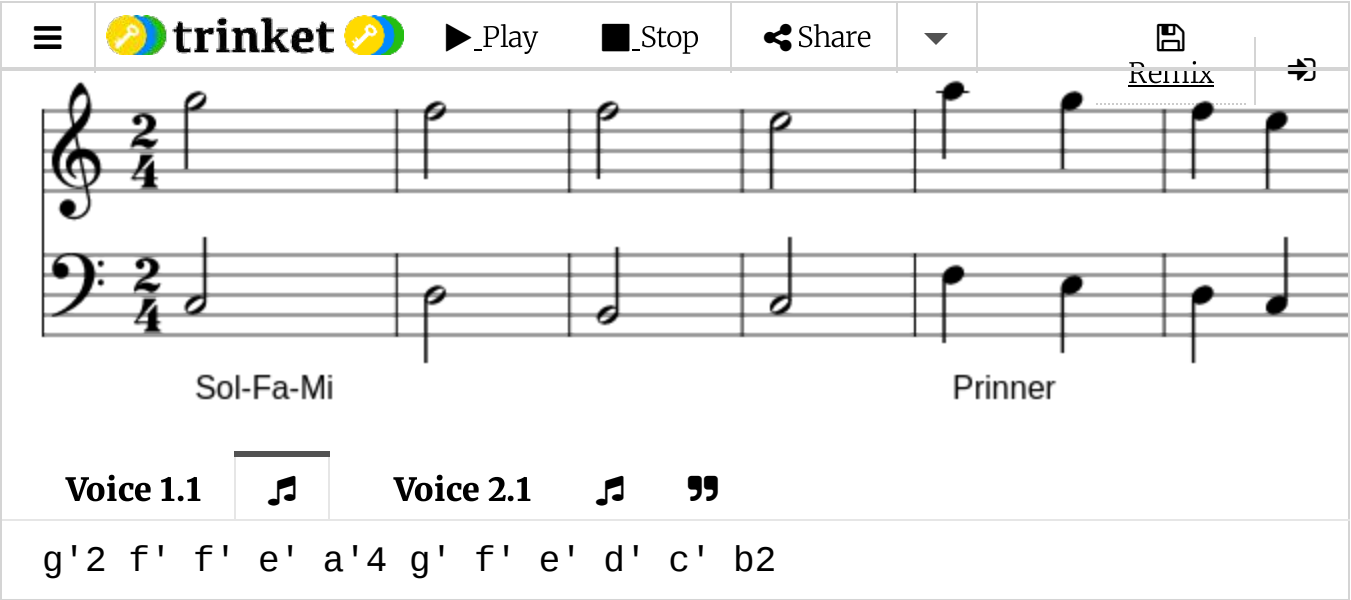
By compressing the last two bars into a single bar, we can convert this into a PAC-ending sentence. (And combined, the two versions could form a 16-bar compound theme.)



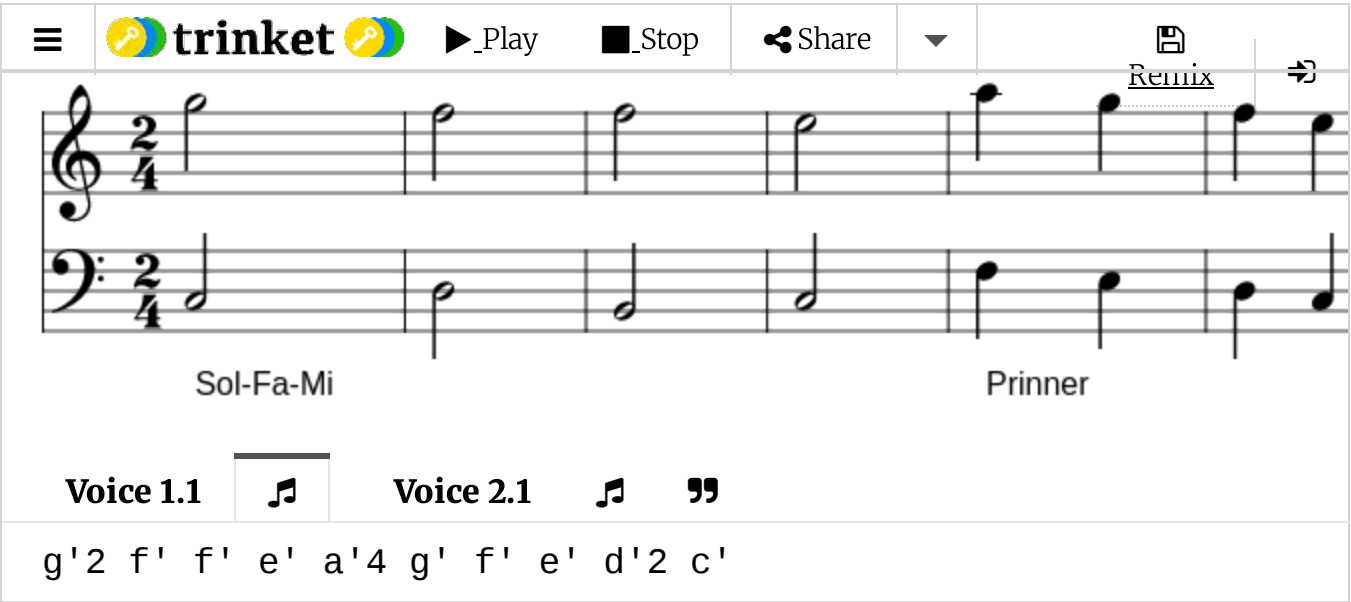
Presentation – Fast Prinner – Cadence

Instead of a Passo Indietro (half of a Prinner), we could use a full Prinner, but twice as fast. This allows the melody to move more in the latter half of the sentence, accomplishing the fragmentation and acceleration of melodic and harmonic rhythm that are common to continuation phrases.

Following is a sentence formed by Sol-Fa-Mi – Prinner – Fa-Fi-Sol HC.



And the same, but ending with a simple PAC.



Practicing

To practice improvising using these schemata, you can play along with the mp3 audio files below, created by Mark Arnett. Each recording is in C major, simple quadruple meter, and contains an Alberti-bass left hand with the melodic skeleton in the right hand.

Individual schemata

- Aprile
- Do–Re–Mi
- Fonte
- Jupiter – root-position dominant
- Jupiter – inverted dominant
- Meyer
- Monte
- Pastorella

- Prinner (4-stage)
- Prinner (5-stage)
- Modulating Prinner (4-stage)
- Modulating Prinner (5-stage)
- Sol–Fa–Mi – II chord on stage two
- Sol–Fa–Mi – VII chord on stage two

Sentential schema chains

- Jupiter – Passo Indietro – Compound HC
- Jupiter – Passo Indietro – Compound PAC
- Meyer – 5-stage Prinner
- Sol–Fa–Mi – Prinner (two bars) – Fa–Fi–Sol HC

CHAPTER OVERVIEW

6: Post-Tonal Music (I)

6.1: Pitch (class)
6.2: Interval (class)
6.3: Modulo Arithmetic
6.4: Organizing Forces - Collections and Scales
6.5: Organizing Forces - Symmetry and Centricity
6.6: Set Theory - Normal Order
6.7: Set Theory - Transposition
6.8: Set Theory - Inversion
6.9: Set Theory - Set Class and Prime Form (1)
6.10: Set Theory - Set Class and Prime Form (2)
6.11: Set Theory - Complements
6.12: Set Theory - Common Tones under Transposition

6.1: Pitch (class)

Tonality is highly charged system where *scale degrees* are endowed with a magnetic or gravitational pull towards other tones. Within the key of C major, B-natural is attracted to the tonic C, other members of the dominant triad are attracted to the tonic triad, and other scale degrees have functions as well. *Spelling* is extremely important within common-practice tonality. A-flat — as lowered scale degree 6 — leads to G, but G-sharp — as raised scale degree 5 — leads to A. Underlying "scale degree" and "spelling" are two important concepts that will influence our study of post-tonal music.

Octave Equivalence

"Scale degree" implies an *equivalence* between pitches that are spelled the same but any number of octaves apart. C4 is the same as C3 is the same as C9, and so on. The concept of scale degree, then, has the idea of *octave equivalence* embedded within it.

Enharmonic Equivalence

Though *octave equivalence* is central to our understanding of tonal music, enharmonic equivalence often is not. In the key of C major, A-flat and G-sharp are *not* equivalent, though in isolation they sound the same. Spelling often indicates tendency: A-flat *falls* to G and G-sharp *rises* to A.

In post-tonal music, enharmonic equivalence is often assumed — with exceptions of course. Because many composers no longer felt constrained by a tonal center, the same gravitational relationships amongst tones that we find in tonal music aren't important. A-flat and G-sharp, therefore, can be treated as representations of the same thing.

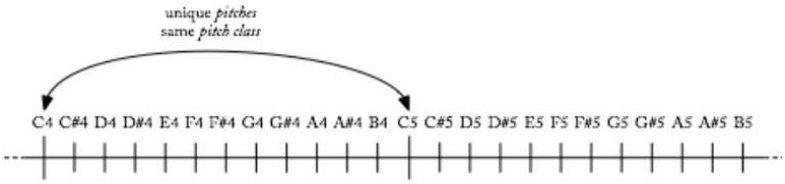
Pitch

Pitches are discrete tones with individual frequencies. The concept of pitch, then, does not imply octave equivalence. C4 is a pitch, and it is not the same pitch as C3.

Pitch class

Pitch classes are *pitches* under octave equivalence that are also spelled the same. A4, A3, A2, etc. are all members of the pitch class A.

Pitch Space

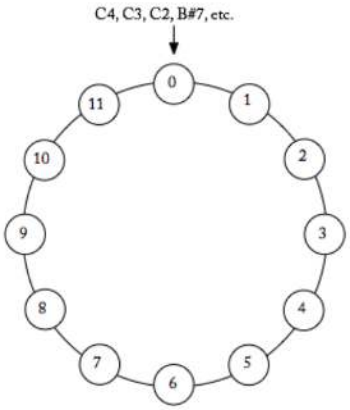


Integer notation

When analyzing post-tonal music where assuming octave equivalence and enharmonic equivalence is appropriate, we can use integers to represent pitch class. All C's and any notes that are enharmonically-equivalent to C (B-sharp, for example) are pitch class 0. All C-sharps's and any notes that are enharmonically-equivalent to C-sharp (D-flat, for example) are pitch class 1. And so on: C = 0, C-sharp = 1, D = 2, D-sharp = 3, E = 4, F = 5, F-sharp = 6, G = 7, G-sharp = 8, A = 9, B-flat = 10 (T), and B = 1 1 (E).

This type of pitch-class, which assumes octave and enharmonic equivalence is easily visualized on a clock-face diagram, like the one below.

Pitch-Class Space



Disclaimer!

Post-tonal music is extremely various. Composers have individual compositional styles, aesthetic goals, and unique conceptions of pitch. All this is to say that you must approach a composition with flexibility. For example: because it is quasi-tonal, Debussy's music often benefits from a view that does *not* assume enharmonic equivalence. But sometimes it does. You must rely on your musical intuitions when analyzing this music, and you should also be willing to approach pitch in these compositions from multiple perspectives until you find one that seems most appropriate.

6.2: Interval (class)

Because intervals are dependent upon the pitches that create them, the consonance and dissonance of intervals in tonal music is determined by tonality itself. Imagine the interval create by G and B-flat, a minor third. In the context of G minor, this is a consonant interval. Respelled as G and A-sharp, it creates a dissonant augmented second. From a tonal perspective, the two intervals are different even though they are the same in isolation.

Pitch interval

When analyzing post-tonal music, we will often want to assert that similarity, especially when assumming the enharmonic equivalence of pitches. For us, the intervals G-B-flat and G-A-sharp *are* the same.

Pitch intervals are the distance between *pitches* as measured in half steps. Thus, the interval from G4 to A-sharp5 = +15. Think of it like this: if you are G4, how many half steps do you need to move to get to A-sharp5? You'd need to move up 15.

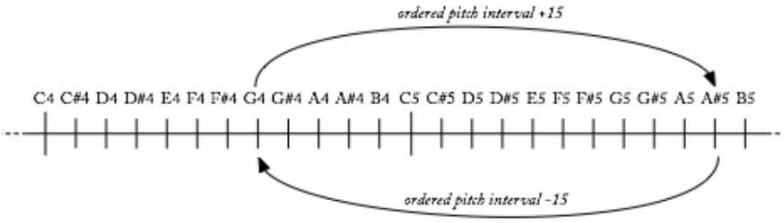
Pitch-class intervals

Pitch-class intervals are the distance between *pitch classes* as measured in semitones. Returning to our G4-A-sharp5 interval, we are now interested just in the pitch classes G and A-sharp. To go from G to A-sharp in pitch-class terms, we just have to move up 3.

Ordered intervals

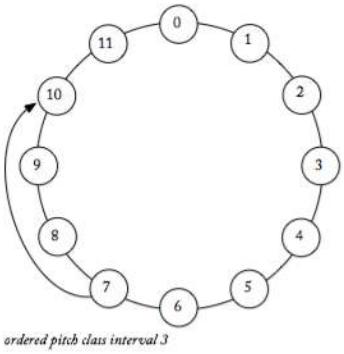
These intervals can be calculated with respect to their *order* (G4 to A-sharp5 is not the same as A-sharp5 to G4) or without worrying about order (G4 to A-sharp5 is the same as A-sharp5 to G4).

Ordered Pitch Interval



Ordered pitch intervals should always have a "+" or "-" sign appended to them, representing the direction we have to travel. The ordered pitch interval from G4 to B-flat5 is +15, but the ordered pitch interval from A-sharp5 to G4 is -15.

Ordered Pitch-Class Interval

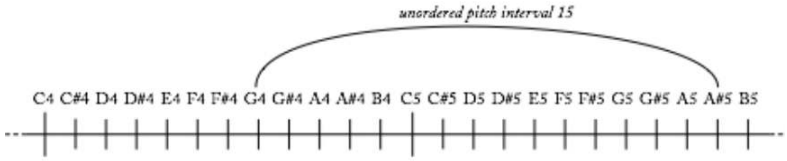


Ordered pitch-class intervals are measured going around the "clock" in clockwise fashion. Thus, from G to A-sharp = 3, and from A-sharp to G = 9.

Unordered intervals

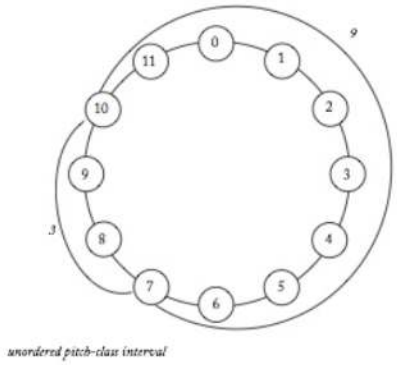
Unordered intervals represent the *shortest distance* between two pitches or pitch classes, without any reference to the order they are in. To determine the unordered interval, simply find the shortest distance between two pitches.

Unordered Pitch Interval



The unordered pitch interval from G4 to A-sharp5 is 15.

Unordered Pitch-Class Interval (Interval Class)



The unordered pitch-class interval from G to A-sharp is 3.

Summary

Using various combinations of pitch interval, pitch-class interval, ordered, and unordered, we arrive at four different conceptions of interval. To wrap your mind around each of these and begin to understand their various analytical uses, think of them on a sliding scale of most concrete — the ordered pitch interval — to most abstract — the unordered pitch-class interval.

6.3: Modulo Arithmetic

What time is four hours later than 10 o'clock?

When we make calculations like this, we are doing *modular arithmetic*. Modular arithmetic is like regular arithmetic, except that the numbers "wrap around" or restart when they reach a certain value, called the *modulus*. In the case of our 12-hour clock, the modulus is 12.

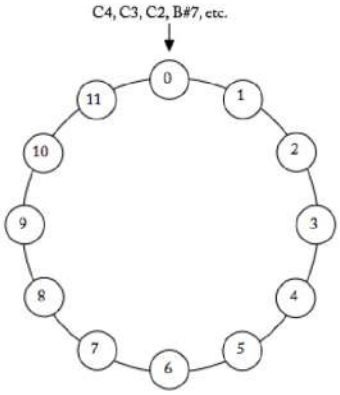
Musical structures can often be best understood using this modular arithmetic. Think of the C-major scale. We begin on C, then D, E, F, G *and back to A* before B and returning to C. This is a modular system — we might call it *modulo-G* because after G we go back to the beginning (A).

In post-tonal music, once we assume octave and enharmonic equivalence, our pitch-class environment includes twelve unique pitch classes, just like the twelve hours on the clock. In this universe, modular arithmetic is a very useful way to imagine getting around.

Counting in this *modulo 12* (or *mod12*) universe works just as in basic math ["1, 2, 3, …"], but after 11, we "begin again" at 0. (Note that while clocks start at 1 and end on 12, modular arithmetic always (re)starts with zero.) Conversely, when counting down ["10, 9, 8, …"], we follow 0 with 11.

While we are used to thinking of numbers on an infinite line, modular thinking wraps them into a finite number, generally represented by a circle. On this circle, all values are a number from 0 to 11.

Pitch-Class Space



Addition and Subtraction

To add or subtract in mod12, perform the calculation in the usual manner (7 + 15 = 22) and then add or subtract 12s until you get a number from 0 to 11 (22 - 12 = 10).

Adding and subtracting can represent many musical ideas: moving seven half steps above D takes you to A (2 + 7 = 9); combining 2 half steps and 11 half steps produces 1 half step (2 + 11 = 1; or starting with C, moving up 2 half steps reaches D, and 11 more C-sharp — 1 higher than the original C).

Modular arithmetic is a quick way to calculate various intervals between pitches or pitch classess. Some examples:

What is the interval class from pitch class 7 (G) to pitch class 10 (B-flat)? 10 - 7 = 3 What is the pitch class 5 semitones above B-natural (11)? 11 + 5 = 4. That is, E.

6.4: Organizing Forces - Collections and Scales

Folk, pop, classical, and modern composers often organize pitch materials using scales other than major and minor. Some of these scales, like the various diatonic *modes* and the pentatonic collection, are relatively familiar to most listeners. Others — such as octatonic, whole-tone, and acoustic collections/scales — are more novel, and usually (but not always) found in twentieth- and twenty-first-century compositions.

When characterizing many of these new musical resources, the word "collection" is often more appropriate than "scale." A *collection* is a group of notes — usually five or more. Imagine a collection as a source from which a composer can draw musical material — a kind of "soup" within which pitch-classes float freely. Collections by themselves do not imply a tonal center. But in a composition a composer may establish a tonal center by privileging one note of the collection, which we then call a *scale*.

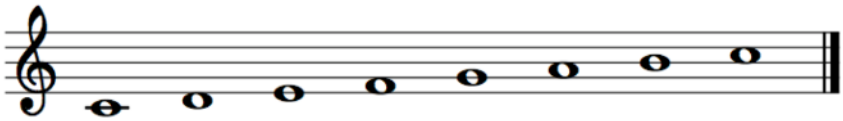
Diatonic Collection (modes)

The *diatonic collection* is any transposition of the 7 white keys on the piano. Refer to these collections by the number of sharps and flats they contain: the "0-sharp" collection, the "1-sharp" collection, and so on. The "2-flat" collection, for example, contains the pitch classes {F, G, A, B-flat, C, D, E-flat}.

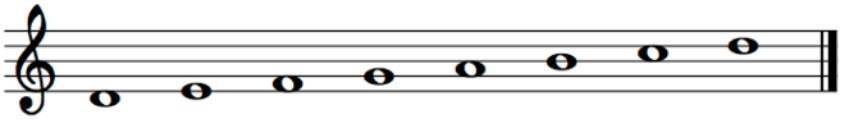
When these collections gain a tonic note, they morph into scales, which by tradition we name according to the "modal" system established in centuries ago. (Note that while these modes share their names with the modes of the Medieval Christian church, they function quite differently. The similarity is principally one of name.)

One way to look at these "modes" is to think of the seven white keys of the piano {C, D, E, F, A, B}. These notes, when starting on different pitches, create the different modal scales. By taking each note of the seven-white-key collection, and treating it as as the tonic, all seven modal scales can be played. Ionian treats C as tonic, Dorian treats D as tonic, Phrygian treats E as tonic, Lydian treats F as tonic, Mixolydian treats G as tonic, Aeolian treats A as tonic, and Locrian treats B as tonic:

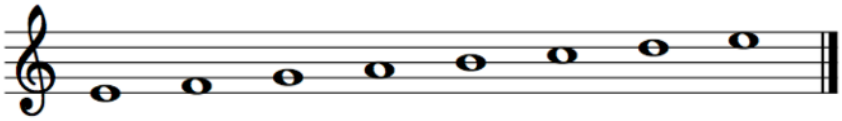
Ionian mode (major scale): *do re mi fa sol la ti do*



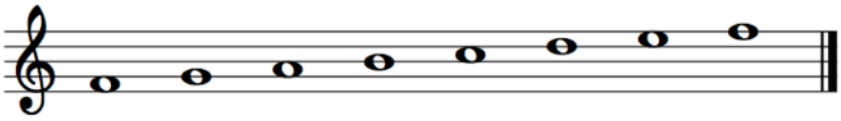
Dorian mode: *do re me fa sol la te do*



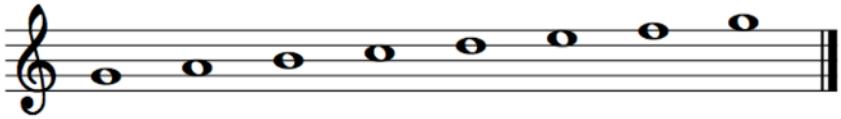
Phrygian mode: *do ra me fa sol le te do*



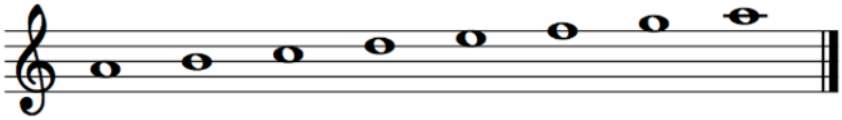
Lydian mode: *do re mi fi sol la ti do*



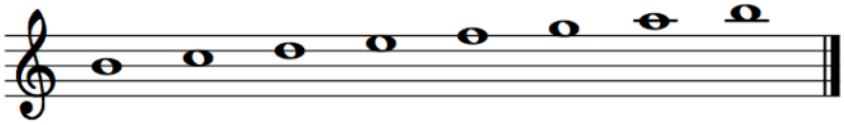
Mixolydian mode: *do re mi fa sol la te do*



Aeolian mode (natural-minor scale): *do re me fa sol le te do*



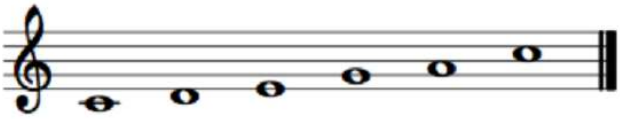
Locrian mode (uncommon outside jazz): *do ra me fa se le te do*



Like the major and minor scales, these intervallic relationships can be transposed to any tonic pitch.

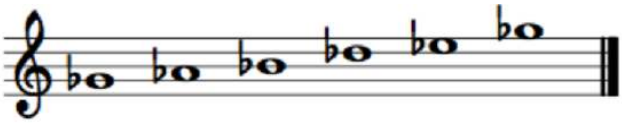
Pentatonic Collection

Pentatonic collections are five-note *subsets* of the diatonic collection. Here's a quick way to create a pentatonic collection: (1) List the notes of a major scale. (2) Remove scale degrees 4 and 7. (E.g., the pentatonic collection {C,D,E,G,A} corresponds to scale degrees 1,2,3,5,6 of the C major scale.)



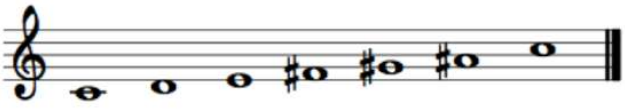
Removing scale degrees 4 and 7 results in a collection with no half steps. As a result of its "halfsteplessness", any member of the collection easily functions as a tonal center. For example, given the 0-sharp pentatonic collection, there are five unique scales formed when each of the collection's pitch classes become a tonic: C pentatonic (C,D,E,G,A), D pentatonic (D,E,G,A,C), E pentatonic (E,G,A,C,D), and so on.

The black keys on the piano also form a pentatonic collection:



Whole Tone Collection

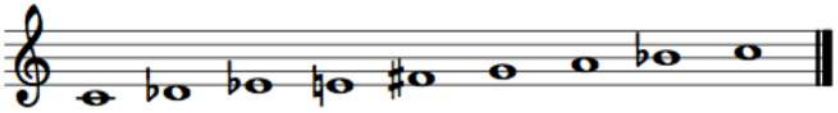
This is a group of notes generated entirely by whole tones: {0,2,4,6,8,10}, for example.



There are only two unique *whole-tone* collections. WT0 contains pitch classes {0,2,4,6,8,10}, while WT1 contains pitch classes {1,3,5,7,9,11}. In other words, WT0 contains the pitch classes {C, D, E, F-sharp, G-sharp, B-flat}, while WT1 contains pitch classes {C-sharp, D-sharp, F, G, A, B}.

Octatonic Collection

Called octatonic because it has eight pitch classes, the *octatonic collection* is full of compositional potential and has been used by many composers to a variety of ends. An octatonic collection is easily generated by alternating half steps and whole steps. Using pitch class numbers, one example is {0,1,3,4,6,7,9,10}.



The interval content of this collection is very homogenous, and this intervallic consistency leads to one of its most interesting properties. When we transpose the above collection by 3—adding 3 to each of the integers in the collection—{0,1,3,4,6,7,9,10} becomes {3,4,6,7,9,10,0,1}. Comparing the two shows that these collections are exactly the same! In fact, you would come up with the same collection if you transposed it by 6 or 9 as well.

Olivier Messiaen called such collections "modes of limited transposition." (The whole-tone scale is also a mode of limited transposition.) And as a result of the property, there are only three unique octatonic collections. We name these arbitrarily as OCT(0,1), OCT(1,2), and OCT(2,3). The numbers to the right of "OCT" are pitch classes within that scale. (E.g., the {0,1,3,4,6,7,9,10} collection I discussed above is OCT(1,2).) We can also call them C–C♯ octatonic, C♯–D octatonic, and D–E♭ octatonic.

Other Collections and Scales

There are many, many other collections and scales used by composers and musicians in the twentieth- and twenty-first centuries. Messiaen, for example, described five more modes of limited transposition, and there are other smaller collections that have the same property. Acoustic scales, formed from the first seven unique partials of the overtone series, are common in the music of Debussy, Bartok, and Crumb — ocassionally as a representation of nature. Jazz musicians have an entire set of scales used for improvisation. Non-Western musics often have unique systems of scales and collections, such as the rāgas used in Indian classical music.

More generally, any large set of pitch classes that form the basis for a passage may function as a collection, even if it has no familiar name. Most often, music theorists refer to these collections with pitch-class set notation.

This resource was created by Brian Moseley and contains contributions from Meredith Cahill, Elise Campbell, and Kris Shaffer.

6.5: Organizing Forces - Symmetry and Centricity

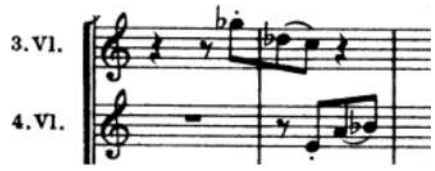
Centricity in post-tonal music can be established in a variety of ways, often simply by emphasis. When a particular pitch-class is regularly the lowest, highest, loudest, or longest in a passage, that pitch-class becomes something like a tonic.

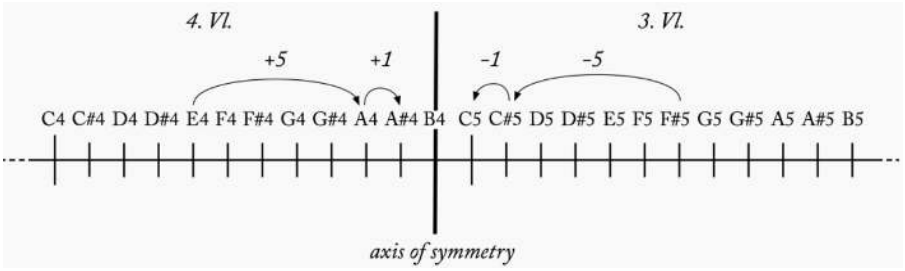
Apart from these means, pitch and/or pitch-class symmetry represents a novel method by which post-tonal composers created centricity in their music. And the study of symmetry in general takes us far afield of the compositional techniques generally associated with common-practice tonal music.

Pitch Symmetry

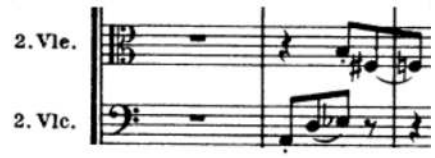
Think of pitch symmetry in terms of a musical "mirror." In the passage below — from Bartók's *Music for Strings, Percussion, and Celesta* — the third violin (3. Vl.) plays a gesture comprising two descending pitch intervals: –5 followed by –1. That is *mirrored* by the fourth violin (4. Vl), who plays the same pitch intervals, only ascending: +5 followed by +1. Below the example, I've diagrammed the gestures in pitch space. And you can that when combined the two gestures create a symmetrical arch.

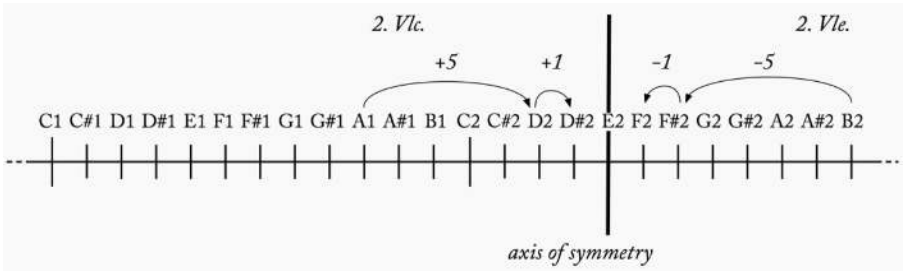
Bartók, *Music for Strings, Percussion, and Celesta*





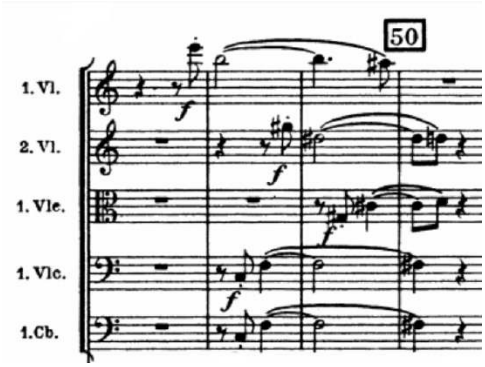
Pitch symmetry always implies an *axis of symmetry*. Maintaining our mirror metaphor, this is the place in pitch space where the mirror exists. In the case of the example above, the mirror is located at B4. Below, you'll see the same gesture in the lower strings. The pitch-space line shows that it has a different *axis of symmetry* — around E2.



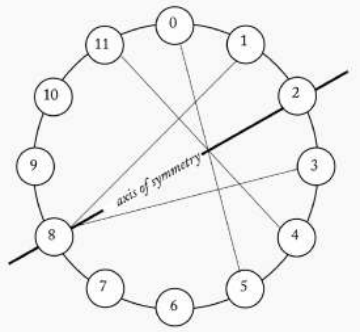


Pitch-Class Symmetry

Pitch-class symmetry is very similar to pitch symmetry, but understood in pitch-class space. Below you'll see another passage from the same piece by Bartók. As above the lower strings have an ascending gesture that mirrors the descending gesture in the upper strings.



Mapping this on the pitch-class circle shows the passage's pitch-class symmetry. Look at this circular diagram very carefully. You'll notice that the passage is pitch-class symmetrical around *both 2 and 8*. Unlike pitch space, pitch-class axes are always located at *two different points* in the pitch-class circle.



6.6: Set Theory - Normal Order

Normal order (sometimes called normal form) has a lot in common with the concept of triad “root position.” Among other things, root position is a standard way to order the pitch-classes of triads and seventh chords so that we can classify and compare them easily. Normal order does the same, but in a more generalized way so as to apply to chords containing a variety of notes and intervals.

Normal order is the most compressed way to write a given collection of pitch classes. Often, you’ll be able to determine normal order intuitively using a keyboard or a clockface, but it’s good to learn a process that will always give you the correct answer.

1. Write as a collection of pitch classes (eliminating duplicates) in ascending order and within a single octave. There are many possible answers.
2. Duplicate the first pitch class at the end.
3. Find the largest ordered pitch-class interval between adjacent pitch classes.
4. Rewrite the collection beginning with the pitch class to the right of the largest interval and write your answer in square brackets.

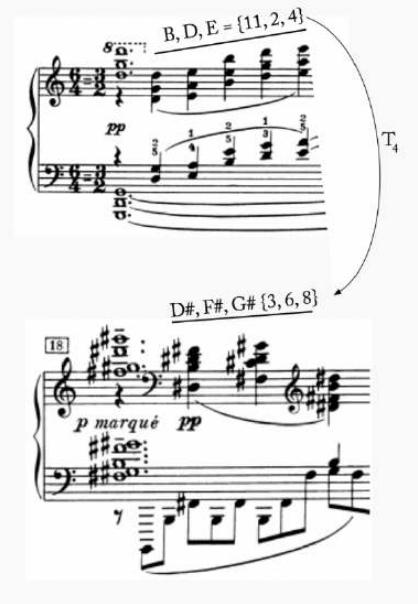
For example, given {G-sharp4, A2, D-sharp3, A4}:

1. *Write as a collection of pitch classes (eliminating duplicates) in ascending order and within a single octave.* {8,9,3}
2. *Duplicate the first pitch class at the end.* {8,9,3,8}
3. *Find the largest ordered pitch-class interval between adjacent pitch classes.* In this case, the largest interval is between “9” and “3.”
4. *Rewrite the collection beginning with the pitch class to the right of the largest interval and write your answer in square brackets.* [3,8,9]

Occasionally you’ll have a tie in step 3. In these cases, write the ordering implied by each tie and calculate the interval from the first to the penultimate pitch class. The ordering with the smallest interval is the normal order.

6.7: Set Theory - Transposition

In post-tonal music, transposition is often associated with motion: Take a chord, motive, melody, and when it is transposed, the aural effect is of *moving* that chord, motive, or melody in some direction. That's the effect here, in two disconnected passages from Debussy's, *La cathédrale engloutie*:



The opening motive — comprising the notes B, D, E, or {11, 2, 4} — is transposed four semitones higher in m. 18, representing the cathedral's slow ascent above the water. Transposing something preserves its intervallic content, and not only that, it preserves the specific arrangement of that thing's intervals. When we hear the passage at m. 18 above, we recognize its relationship to the passage in m. 1 because the same intervals return, but starting on a different pitch.

Transposition is an operation — something that is *done* to a pitch, pitch class, or collection of these things — or alternatively a *measurement* — representing the distance between things. We represent it as *Tn*, where *n* represents the ordered pitch-class interval between the two things. To transpose something by *Tn*, add *n* to every element in that thing (mod 12). Given the collection of pitch classes in m. 1 above and transposition by *T4*:

$$\begin{array}{r} 11\ \ 2\ \ 4 \\ +4\ \ 4\ \ 4 \\ \hline 3\ \ 6\ \ 8 \end{array}$$

The result is the pitch classes in m. 18. *T4* {11, 2, 4} = {3, 6, 8}.

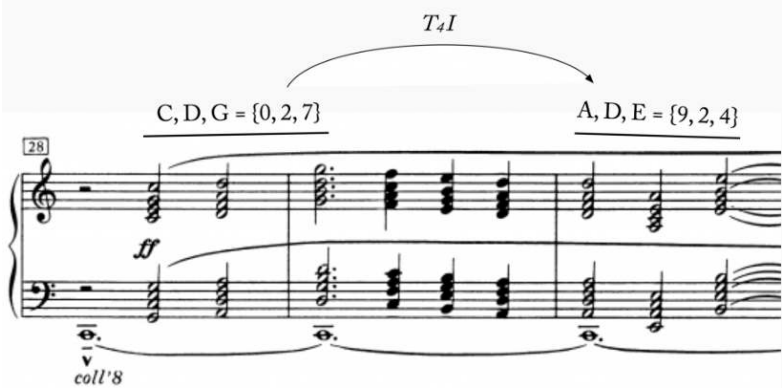
Alternatively, to determine the transpositional relationship *between* two things, subtract the first thing from the second. If the numbers that result are all the same, the two things are related by that *Tn*.

$$\begin{array}{r} 3\ \ 6\ \ 8 \\ -11\ \ 2\ \ 4 \\ \hline 4\ \ 4\ \ 4 \end{array} \qquad \{3, 6, 8\} \text{ and } \{11, 2, 4\} \text{ are related by } T4$$

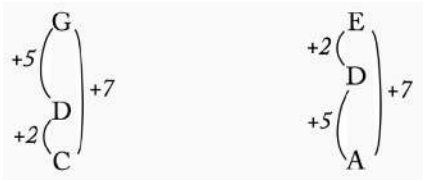
This is how I arrived at the *T4* arrow label in the musical example above, by "subtracting" the pitch class integers of m. 1 from the pitch-class integers in m. 18.

6.8: Set Theory - Inversion

Inversion, like transposition, is often associated with motion that connects similar objects. You need to be able to (1) invert a collection of pitches and (2) determine the inversional relationship between two collections of pitches.

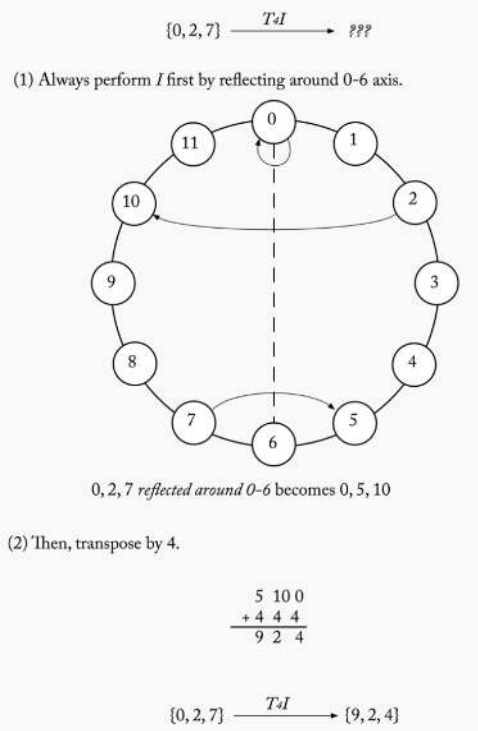


This passage above from Debussy's "Sunken Cathedral" is an example. Just as was the case in the [transpositionally-related passages][transposition], these two gestures have the same intervallic content—and so, our ears recognize them as very similar. (Debussy underscores that similarity by giving both of the gestures the same rhythmic setting.) Unlike transposition, however, the interval content of these two gestures is not *arranged* in the same way.

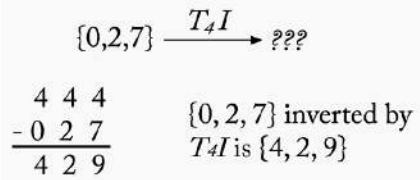


Both have the same intervals, but the {A,D,E} collection has the +5 on the bottom instead of on the top.

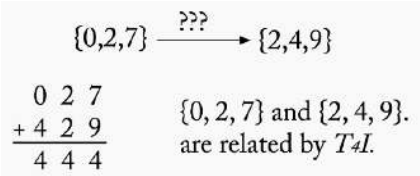
Inverting something is a two-step process, performed *in this order*: (1) Reflect the pitch classes in an object around the 0-6 axis of symmetry, and then (2) transpose it. I'll illustrate first on a clock, and then show you an easier way:



Fortunately, there is a much quicker way to invert a pitch or collection of pitches! Given any collection of pitch classes and a *TnI*, simply subtract the the pitch classes from *n:*



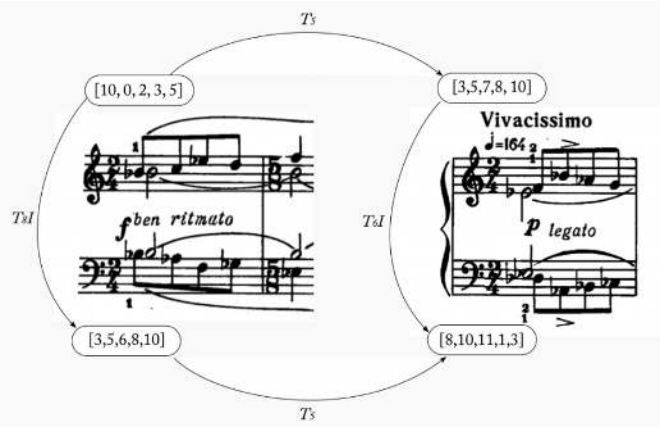
Conversely, to determine the *TnI* that relates two collections of pitch classes, find a common value to which they all sum. That is the *n* in *TnI:*



6.9: Set Theory - Set Class and Prime Form (1)

Lots of concepts in pitch-class set theory are best viewed along a sliding scale of "concreteness" or "abstractness." A concept like *pitch*, for example, is very concrete, while *pitch class* is somewhat more abstract. We can perform a pitch, but we can't really perform a pitch class. We've seen similar examples in the intervallic realm. Ordered pitch intervals are associated with a very specific sound (e.g., +15); unordered pitch-class intervals (e.g., interval class 1) are less vivid or real. A basic concept in pitch-class set theory is that these levels of concreteness and abstractness encompass not only pitch and interval, but groups of pitch classes as well. These groups of pitch classes are called *pitch-class sets*.

We've already seen sets of pitch-classes, though we haven't really been calling them that. When we extract a group of notes from a passage of music and put them in normal order, that group of notes is a pitch-class set. As we've seen in class, one very interesting way of looking at a lot of post-tonal music is by studying the transpositional and inversional relationships between pitch-class sets. In the short example below (from Bartók's "Subject and Reflection") you'll notice that the right hand of the two passages is *T5*-related, as is the left-hand. Within each passage, the right and left hands are *T8I _and _T6I* related, respectively.

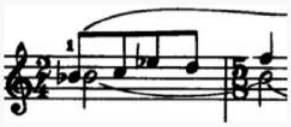


In order for a pitch-class set to be transpositionally or inversionally related to some other pitch class set, they must share the same collection of intervals. This is most easily grasped by remembering that all major and minor triads have the same interval content (M3, m3, and P5). Major triads are transpositionally related to one another, while major and minor triads are inversionally related to one another. The same observation applies in Bartók's "Subject and Reflection." The four pitch-class sets in those two passages all have the same intervallic content and that's why we can label transpositional and inversional relationships between them.

All pitch-class sets that are transpositionally and inversionally related belong to the same *set class*, and they are represented by the same *prime form*. We follow a simple process to put a pitch-class set in prime form:

1. Put the pitch-class set in normal order.
2. Transpose it so that the first pitch class is 0.
3. Invert the results from step 2 (any inversion will work) and put the result in normal order.
4. Transpose it so that the first pitch class is 0.
5. Compare the results of steps (2) and (4). Prime form is the most compact version.

The example below walks demonstrates using the motive from Bartók's "Subject and Reflection."



(1) Normal Order: [10, 0, 2, 3, 5]

(2) Transpose to zero: [0, 2, 4, 5, 7]

(3) Invert (any inversion will work!) step 2 and put the inversion in Normal Order: [5, 7, 8, T, 0]

(4) Transpose to zero: [0, 2, 3, 5, 7]

(5) Finally, compare the results of step (2) and (4). Prime form is the version that is most compact.

Prime Form = (02357)

7 5 [0, 2, 4, 5, 7] 4

7 5 [0, 2, 3, 5, 7] 3

3 is smaller

6.10: Set Theory - Set Class and Prime Form (2)

Analytically, the concept of set class is useful because it can show coherence in a composition. Bartók's "[Subject and Reflection] [1]," for example, uses the (02357) set class nearly exclusively—though it appears in many transpositions and inversions.

Theoretically, the concept is useful because it provides a prism through which we can begin to study the *possibilities* provided to us by the twelve pitch-class universe. For almost 500 years, composers mostly used only a small subset of those possibilities (triads, seventh chords, and so forth). Set class lists reveals all of the other possibilities. They also give us hints as to why tonal composers used only a small portion of them and suggest entire worlds organized through other means. Fortunately for us, we don't need to create such a list because many others have! A particularly good list is found [here][2], and I'll give you another to keep in class.

Most of these set-class lists are organized similarly. Set classes that have the same number of notes in them (we say that they have the same "cardinality") are grouped together: trichords (three-note pitch-class sets) sit together, as do nonachords (nine-note pitch-class sets), and so on.

TRICHORDS

Forte Number	Prime Form	IC Vector
3-1	(012)	<210000>
3-2	(013)	<111000>
3-3	(014)	<101100>
3-4	(015)	<100110>
3-5	(016)	<100011>
3-6	(024)	<020100>
3-7	(025)	<011010>
3-8	(026)	<010101>
3-9	(027)	<010020>
3-10	(036)	<002001>
3-11	(037)	<001110>
3-12	(048)	<000300>

NONACHORDS

IC Vector	Prime Form	Forte Number
<876663>	(012345678)	9-1
<777663>	(012345679)	9-2
<767763>	(012345689)	9-3
<766773>	(012345789)	9-4
<766674>	(012346789)	9-5
<686763>	(01234568T)	9-6
<677673>	(01234578T)	9-7
<676764>	(01234678T)	9-8
<676683>	(01235678T)	9-9
<668664>	(01234679T)	9-10
<667773>	(01235679T)	9-11
<666963>	(01245689T)	9-12

Prime form for each set class is show in parenthesis. The "Forte Number" (3-1, 9-1, etc.), often adjacent to the prime form, was given to each set class by the famous music theorist [Allen Forte][4], who was one of the first to describe the set class list.

Interval Class Vector

The interval class vector next to each set class's prime form is particularly valuable. Think of it as a numeric representation of the "intervallic flavor" of each set class. IC vectors have six places <_ _=""> that are placeholders for interval classes 1–6. If a set class has a single interval class 1, it will have the digit 1 in the interval class vectors first placeholder. The IC vector <001110>, for example describes a trichord with 1 interval class 3, 1 interval class 4, and 1 interval class 5; that is, the major or minor triad, set class (037)!

6.11: Set Theory - Complements

The *literal complement* of a pitch-class set is every pitch not included in that set. For example, the complement of the seven-note C major scale is the five-note pentatonic scale: F-sharp, G-sharp, A-sharp, C-sharp, and D-sharp.

The complement of any *n-chord* is always a *12-n* chord. Thus, a trichord's compliment will be a nonachord, a tetrachords an octachord, and so on.

Below you'll see the trichord [0,1,2]. Its *literal complement* is all of the notes not a part of it: [3,4,5,6,7,8,9,T,E]. When we put both of those pitch-class sets in prime form, the two are said to be *abstract complement*:

	Two "literal" complements	
Normal Form:	[0,1,2]	[3,4,5,6,7,8,9,T,E]
	Two "abstract" complements	
Prime Form:	(012)	(012345678)

On the set-class list, _abstract complements _are listed next to one another, and they have a very interesting intervallic relationship, as you can see by comparing their IC vectors. Complementary set classes have a similar "distribution" of intervals. Below, you'll see that the set (012345678) has exactly 6 more of each type of interval class than does its complement (012). That is, except for the tritone. It has only 3 more.

TRICHORDS			NONACHORDS		
	Prime Form			**Prime Form**	
3-1	(012)	<210000>	<876663>	(012345678)	9-1

+6

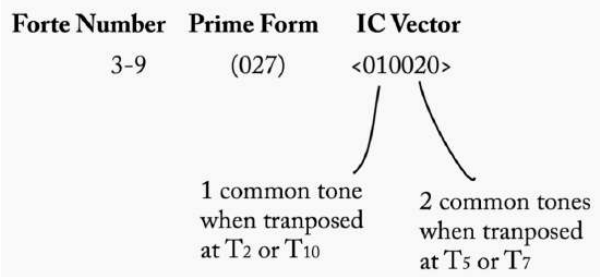
6.12: Set Theory - Common Tones under Transposition

We've already seen that the set class list can tell us some very interesting and important things about the intervallic properties of a set class and its complement.

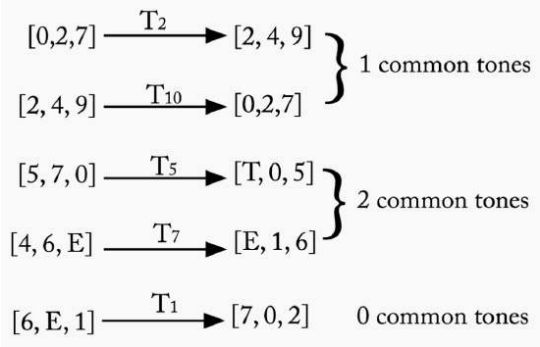
It can also tell us how many common tones are retained when a set is transposed. Here's how it works:

Each placeholder in the interval vector tells us how many of a particular interval class are in a given set class. For example, in the (027) set class shown below, all members of that class will have two interval class 5s and one interval class 2.

Those numbers also tell us how many common tones are retained when those sets are transposed by a member of that interval class. That is, because there is a *1* in the second column, a pitch class set belonging to (027) will retain *1* common tone when transposed by either *T2* or *T10*. Because there is a *2* in the fifth column, it will retain *2* common tones when transposed by either *T5* or *T7*.



You can see this explicitly below. I've taken four arbitrary members of (027)—show on the left—and transposed them in various ways. As indicated above, only *T2*, *T10*, *T5*, or *T7* will keep common tones. Any other transposition will have zero common tones.



If an interval class vector has a tritone, it will retain twice as many common tones under tritone transposition than is indicated in the vector. For example, the trichord (016) has an interval vector of <100011>. When transposed by *T6*, it will have 2—not 1—common tones.

CHAPTER OVERVIEW

7: Post-Tonal Music (II)

7.1: Twelve-Tone Theory - Basics
7.2: Twelve-Tone Theory - Operations
7.3: Twelve-Tone Theory - Intervallic Structure
7.4: Twelve-Tone Theory - Derived Rows
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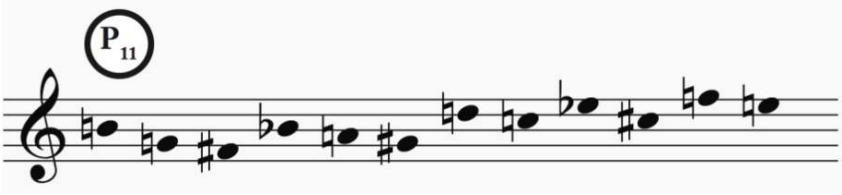
7.7: General Post-Tonal Resources - Analyzing Atonal Music
7.8: General Post-Tonal Resources - Analyzing 12-Tone Music
7.9: General Post-Tonal Resources - Glossary of Atonal Musical Terms
7.10: General Post-Tonal Resources - Sheet of Blank Chromatic-Scale Clock Faces

7.1: Twelve-Tone Theory - Basics

Twelve-tone music is most often associated with a compositional technique, or style, called *serialism*. The terms are not equivalent, however. *Serialism* is a broad designator referring to the *ordering* of things, whether they are pitches, durations, dynamics, and so on. Twelve-tone composition refers more specifically to music based on orderings of the *twelve pitch classes*.

This style of composition is most associated with a group of composers whose figurehead was Arnold Schoenberg and which also included the influential composers Anton Webern and Alban Berg. But twelve-tone compositional techniques and ideas associated with such techniques were very influential for many great composers, and serial and twelve-tone music is still being written today. Much of this music shares similar axioms, outlined below, but composers have used these basic ideas to cultivate entirely original approaches.

Twelve-tone music is based on *series* (sometimes called a *row*) that contains all twelve pitch classes in a particular order. There is no one series used for all twelve-tone music; most composers write a unique row for each piece. (There 12!—that is, 12 factorial—twelve-tone series, which is equal to 479,001,600 unique row forms. Quite a lot of possibilities!) Here's an example, the row for Webern's Piano Variations, Op. 27:

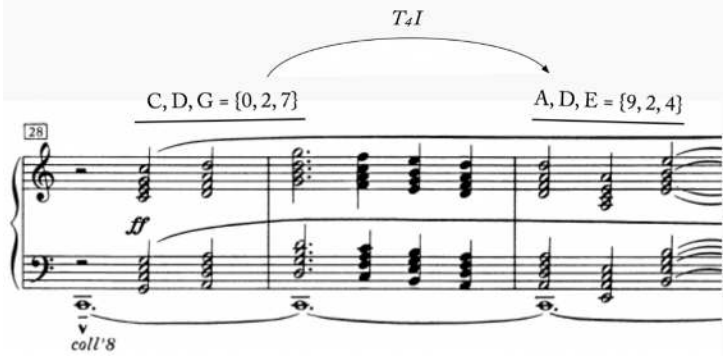


There are some general rules for using a twelve-tone row, though as I said, individual approaches are always different:

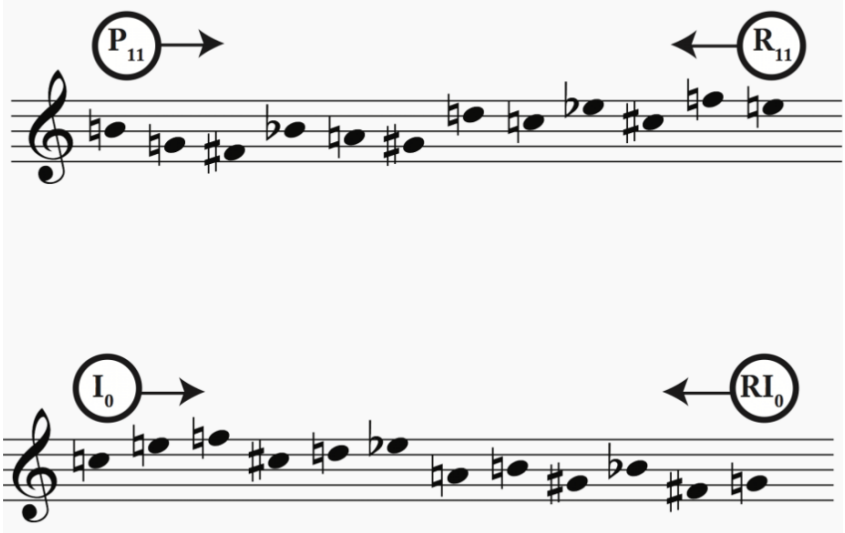
```
1. Pitch classes are played in order;
2. Once a pitch class has been played, it isn't repeated until the next row.
```

A twelve-tone row might be used as a theme or as a source for motives. Chords might be derived from the row, or the row may be used for both thematic and harmonic purposes. We call the basic ordering, shown above for Op. 27, the *prime form* (P). And because it begins on B (pitch class 11), we label it **P11**.

Rows can be transposed, inverted, retrograded, or any combination of those operations. Inverting the prime form results in an "I-form." Like P-forms I-forms are labeled by their first pitch-class. Hence, the row below, an inversion of the one above, is called **I0**. Note that it starts on C (0).



Prime forms and inversion forms can be also be played backwards, also called retrograde. In the example below notice how this work in relation to the P11 and I0 rows from above. When a P-form is retrograded, we call it a "R-form." When an I-form is retrograded, it's called an "RI-form." As the example shows, R- and RI-forms are labeled according to their *last pitch class*.



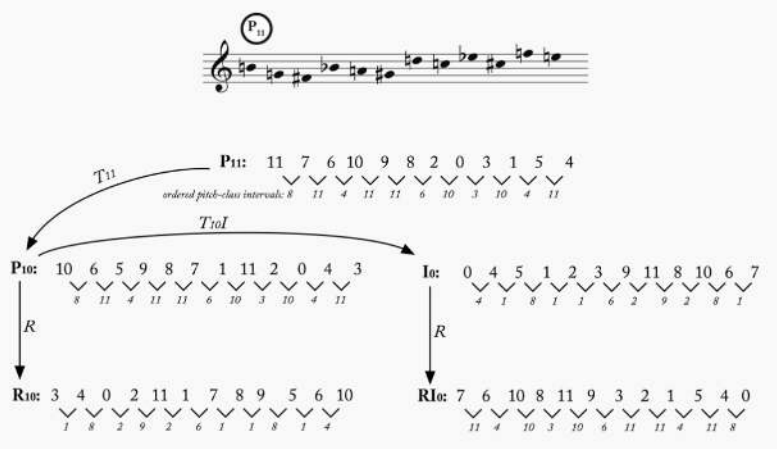
That graphic shows only four row forms, but each of those forms has twelve transpositions. Thus, a single row breeds a total of 48 rows: 12 *4. That collection of rows is called a *row class*, and it is the *row class* that the composer draws from when writing his or her music.

7.2: Twelve-Tone Theory - Operations

Like pitch-class sets, twelve-tone rows can be transposed (*Tn*), inverted (*I*), or transposed and inverted (*TnI*). Like transposing a pitch-class set, transposing a row is accomplished by *adding* a constant value to all of the pitch-classes of the row *while maintaining the order*. In the example below, I have transposed **P11** by *T11* by adding 11 to each of the pitch classes of **P11**. The new row is called **P10** because it begins with pitch class 10.

Inversion occurs when we *subtract* each pitch class of the row from a constant value. Again referring to the example below, when I do *T10I* of **P11** is accomplished by subtracting every pitch class of **P11** from 10.

Twelve-tone rows can be *retrograded* as well, symbolized as *R*. To retrograde a row we read it backwards. Reading **P11** backwards results in the row form shown below **P11** in the example: R11. (Remember that retrograde rows are labeld according to their *final* pitch class.) Reading **I0** backwards results in **RI0**—just below it in the example.



It's important that you know the difference between *operations* and row forms, because they are often labeled similarly. In these resources *operations* like transposition and inversion will always be italicized. ***Row forms*** will be bolded.

You need to memorize the effect of transposing, inverting, or retrograding any particular type of row. That is, you should know what kind of ***row form*** results when you perform any *operation* on it. For example, if you *transpose* a **P-form,** what kind of row form results? What about when you retrograde an **RI-form**? The flowchart below will be helpful:

7.3: Twelve-Tone Theory - Intervallic Structure

Pitch-class orderings are not the only things ordered by twelve-tone rows. Because pitch classes are always in relationships with one another, a twelve-tone row is also an ordered collection of *intervals*. Understanding the intervallic structure of a row class is the best way to get a sense of what it will sound like.

Below, you'll see the figure from resource on operations. Below each of the row forms in that example, I have shown the series of ordered pitch-class intervals.

Rows that are **transpositionally-related** (as **P11** and **P10** are) have *the same* series of ordered pitch-class intervals.

Rows that are **inversionally-related** (as **P10** and **I0** are) have *complementary* ordered pitch-class intervals. That is, intervals in corresponding locations in the row forms "sum to 12."

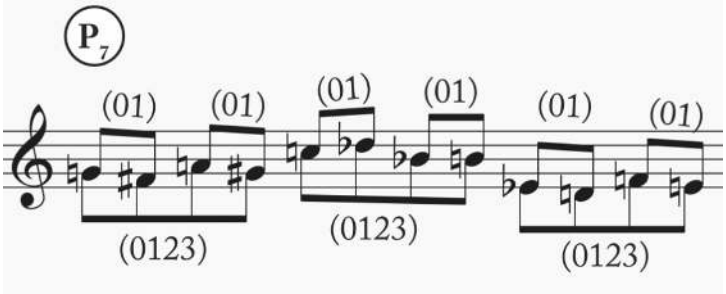
Rows that are **retrograde-related** have ordered pitch-class intervals that are *reverse complements*. Compare **P10** and **R10**. Reading **R10** backwards, the *final* three intervals (for example) are 4 1 8. Those are the complements of **P10**'s *first* three intervals: 8 11 4.

Rows that are **retrograde-inversion related** have ordered pitch-class intervals that are *reverses* of one another. Compare **P10** and **RI0**. Reading **RI0**′s intervals backwards, you'll notice that they are the *same* as **P10**′s read forwards.

7.4: Twelve-Tone Theory - Derived Rows

Derived rows are rows whose non-overlapping segments (*discrete* segments) belong to the same set class. Because they must not overlap, discrete subsets divide the row into either six 2-note segments, four 3-note segments, three 4-note segments, or two 6-note segments. (In general, we are mostly concerned with rows that are trichordally- or tetrachordally-derived.)

An example is offered below. This row (from Webern's String Quartet, Op. 28) has been divided into discrete tetrachords and discrete dyads. All of the tetrachords belong to the set class (0123). Thus, we say that the row is tetrachordally derived, and that it is *generated* by (0123). Further, the discrete dyads indicated an interesting dyadic derivation, by (01).



From a compositional and listener-oriented perspective, derived rows are very suggestive. Because the set-class content of a row doesn't change when it's transposed, inverted, etc., these set classes will circulate constantly throughout a piece, even if different row forms are used. Therefore, a derived row guarantees the regular recurrence of a very small selection of set class—thus ensuring a particular type of unity throughout a piece.

7.5: Twelve-Tone Theory - Invariance

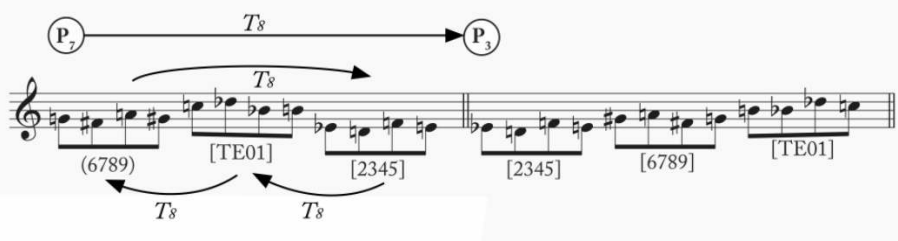
Invariance refers to the preservation of something: intervals, dynamics, rhythms, pitches, and so on. In elementary twelve-tone theory, we are mostly concerned with *intervallic* invariance and *pitch class segmental* invariance.

Intervallic Invariance

Any time a row is transposed, the ordered intervallic content of the row is unchanged. Thus, transposition always results in intervallic invariance. Retrograde inversion creates retrograde intervallic invariance.

Segmental Invariance

When a pitch-class segment of a row is unchanged when that row is transformed, we say that the segment is "held invariant." Consider the following example, from Webern's String Quartet, Op. 28:



The brackets show the discrete tetrachords of the row. Notice that these tetrachords are the *same* amongst the to different rows. That is, the tetrachords are *invariant segments.* These segments are held invariant because of they share the same *relationship* with one another that the rows share. Because the tetrachords are related by *T8*, when the row *as a whole* is transposed by *T8*, those tetrachords are "held invariant." (Think of the process like this: when the first tetrachord [6789] is transposed by *T8*, it becomes the last tetrachord [2345]. And therefore, when the whole row is transposed by *T8*, *_the last tetrachord _becomes* the first tetrachord.)

To determine when and if a pitch-class segment of a row will be held invariant:

(1) Find an equivalent set-class elsewhere in the row. This may be a dyad, trichord, tetrachord, etc.

(2) Determine the transpositional or inversional relationship between them.

(3) When the row is transposed or inverted by that *same* relationship a segment will be held invariant.

7.6: General Post-Tonal Resources - Analyzing a Post-Tonal Piece from Scratch

What makes post-tonal music so interesting is the uniqueness of each piece. As György Ligeti points out, many post-tonal works make use of "one-of-a-kind forms" ("On Form in New Music," 1966). In the best cases, these one-of-a-kind forms can make listening to this music very engaging. (In the worst cases, it can be quite disorienting and frustrating.) In most cases, though, this constant uniqueness makes analysis difficult, as there is not one process or one set of tools that can help musicians figure out the structure and meaning of a piece.

However, there are some general principles that can guide our engagement with post-tonal works. Keeping these principles — really, *questions* — in mind early in the analytical process can help us relate what we are hearing to what we already know, and can help us figure out what tools and procedures to use as we dig deeper into the piece.

Starting out

When engaging a post-tonal work for the first time, the following three questions can offer great help in knowing how to conduct an analysis of the work:

What is the form of the work? Even if we cannot get a clear answer like ABA' right away, certain moments in the music will jump out of the texture as we listen — climaxes, points of arrival, moments when things change. When we hear these moments, we can note them for further analysis: What made that moment sound like a high point or an arrival? What *specifically* changed at that moment? If our ears latched onto it the first time, there's a good chance that it is important, and some composers purposefully use those clearly audible moments to help listeners make sense of their one-of-a-kind musical structures.

What does the title mean? A title like String Quartet No. 1 may not help, but a title like "The Sunken Cathedral" can be both evocative *and* guide us to understand the roles that specific elements in the piece are playing in the larger structure. Again, this can help us narrow down which musical elements are most in need of our analytical attention.

What is the historical context of the work? Was it written by Schoenberg, Berg, or Webern? Then maybe set theory or twelve-tone theory would provide the most insightful tools. Was it written before the 1920s? Don't bother applying mature twelve-tone theory. Was it composed by Debussy or Bartók? Then an analysis of how different pitch-class collections relate to the form might be the best place to start. Was it written by a European after WWII? Then a hunt for serial structures might be in order. Is the piece a ballet by Stravinsky? Look at the rhythm and compare it with a video of the original choreography (if you can find one). Knowing what techniques are associated with what composers/countries/time periods can help narrow things down a lot and direct our attention to musical elements that are more likely to be structurally important than others.

None of these questions will give a fool-proof answer. However, if we ask all three and they all point in the same direction, that's a good sign that we should begin our analysis there.

Get your hands dirty

Once these preliminary questions point us in one or two directions, we can start trying some things out and seeing what works. Whether you are looking for rhythmic motives, pitch-class collections, twelve-tone rows, or trichord/tetrachord cells, keep the following questions in mind as you work:

- What analyses are offering an explanation of your experience of the piece?
- What analyses are answering questions you already had about the piece?
- What analyses are opening up new, more interesting questions?
- And perhaps most importantly: *What analyses are helping you tie seemingly disparate things together with a sense of unity?*

A good musical analysis is a good theory: an explanation of your observations and experience. And since many post-tonal composers try to use a few fundamental principles to generate a diversity of musical effects, the best musical analysis is often the one that can explain the most things with the smallest number of basic principles. (This is not always the case, but if you can find a small set of basic, unifying principles, you've almost certainly got a good analysis.) This is what mathematicians call *elegance*, and it can go a long way in analyzing art, as well.

You may find that your initial hunch did not work out. That may be because of an analytical mistake, so check your work. However, it also may be because the composer is purposefully working against the more obvious expectations that (s)he expects

listeners to bring to their work. So keep and open mind and try a few different things early on to see what looks the most promising.

Always keep in mind your experience of the piece: what stood out to you the most when you heard it the first time, the second time, the twentieth time… Grounding your analysis in your own experience will help motivate you to keep searching. But it will also take advantage of those structures that your brain already knows, but so far can only make sense of unconsciously. Tying your musical instincts to explicit concepts is easier than starting completely from scratch, and it will usually lead to a more personally satisfying result.

This resource written by Kris Shaffer.

7.7: General Post-Tonal Resources - Analyzing Atonal Music

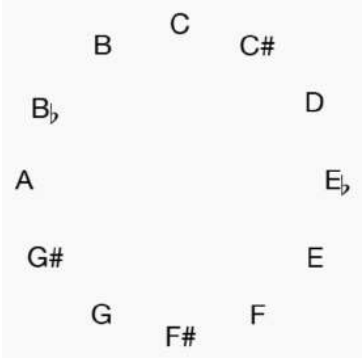
Following are a few tips, terms, and common structures that will be helpful for analyzing early twentieth-century atonal music, such as that composed by members of the Second Viennese School (Schönberg, Berg, Webern).

Intervals

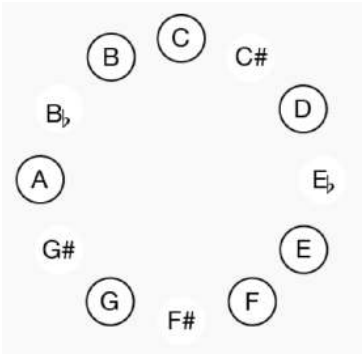
Always use *chromatic intervals* rather than diatonic intervals when analyzing and comparing pitch materials. (See Intervals and dyads resource.)

The 12-pitch-class cycle — clock face

Atonal composers often begin with highly organized set of pitch classes, and then deploy the pitch classes in a wide variety of registers. Thus, it is helpful to eliminate register as a factor in order to find which motives, chords, and fragments belong in the same category. To do so, take a clock face with the twelve pitch-classes (spelling does not matter)



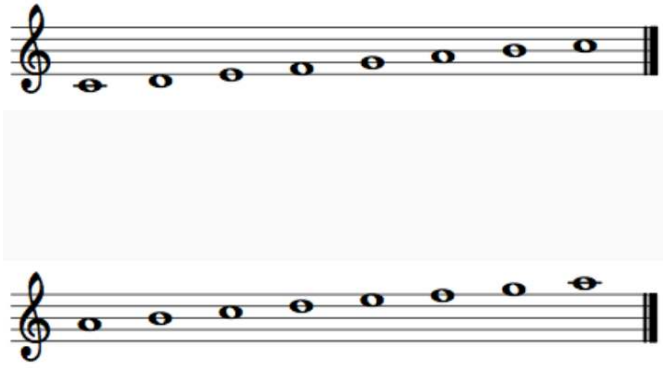
and mark all the pitch classes involved in the fragment. For example, here is a C-major scale:



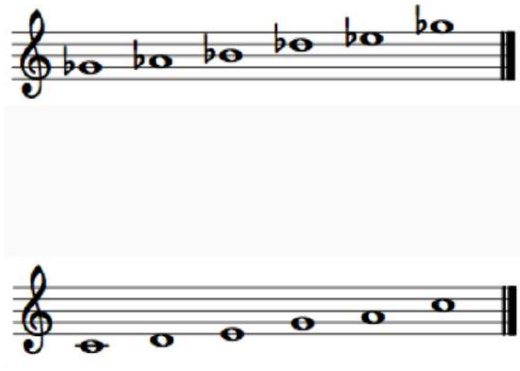
This will make it easy to find the interval patterns in a set of pitch classes, no matter how they are distributed in the various registers and instruments on the score.

Common pitch-class collections

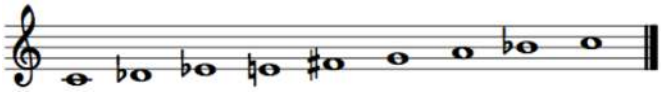
Diatonic – The usual major and *natural*-minor collections (white key collection and all of its transpositions).



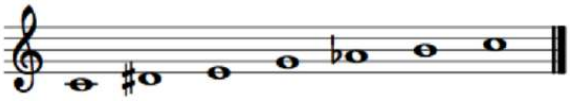
Pentatonic – The black key collection and all of its transpositions, prime form: (02479).



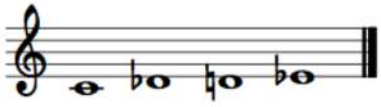
Octatonic – An eight-pitch-class scale that alternates i1 and i2 (semitones and whole-tones).



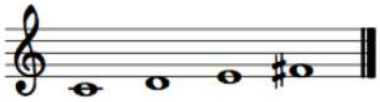
Hexatonic – A six-pitch-class scale that alternates i1 and i3 (semitones and minor thirds/augmented seconds).



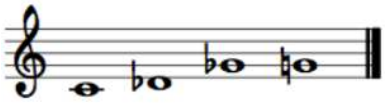
X-cell – The chromatic tetrachord, or a four-pitch-class chromatic cluster, prime form: (0123).



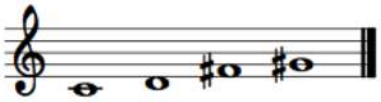
Y-cell – The whole-tone tetrachord, or a four-pitch-class whole-tone cluster, prime form: (0246). It is a subset of the whole-tone scale.



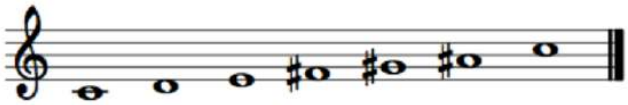
Z-cell – A four-pitch-class collection that alternates i1 and i5 (semitones and perfect fourths), prime form: (0167). Two Z-cells a minor third apart form an octatonic scale.



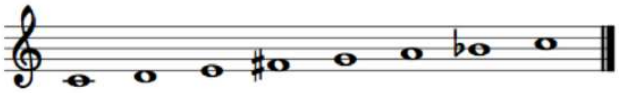
French-sixth – The usual french-augmented-sixth-chord collection, but stripped of its tonal function, prime form: (0268). It is a subset of the whole-tone collection and octatonic collections. Like the Z-cell, two French-sixth chords a minor third apart form an octatonic scale.



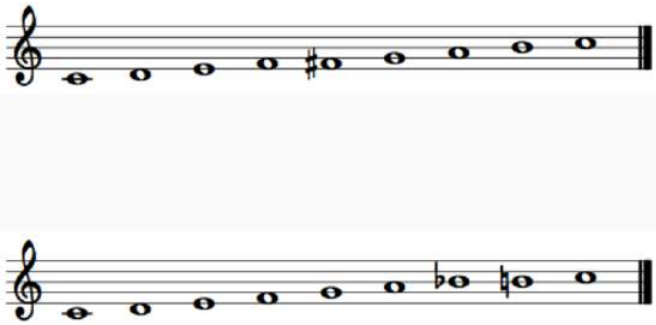
Whole-tone scale – A six-pitch-class scale made up of successive whole tones, prime form: (02468T).



Acoustic scale – A seven-pitch-class scale that resembles the major scale, but with *fa* raised to *fi* and *ti* lowered to *te*, in order to match the seventh and eleventh partials of the natural harmonic series.



Dual-diatonic – An eight-pitch-class scale formed by the union of two diatonic collections separated by fifth—for example C major and G major: C – D – E – F – F# – G – A – B. It contains two diatonic scales, two Z-cells, and two Y-cells. It was used primarily by Bartók.



Common *operations*

Transposition

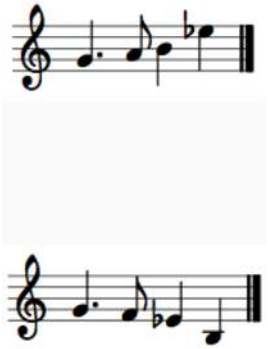
Pitch transposition involves moving every pitch in a collection up or down by a specified interval.

Pitch-class transposition does the same thing. However, because of the cyclical nature of pitch classes, PC-transposition also corresponds to *rotation* of a collection of pitch classes around a clock face.

Transposition operations can be denoted by a capital "T" followed by a subscript indicating the number of semitones of the transposition. For pitch-class transpositions, use ordered pitch-class intervals (numbers 0–11). Transposing a collection or fragment up a whole step is labeled $\mathbf{T_2}$; up a tritone is $\mathbf{T_6}$, down a semitone is $\mathbf{T_{11}}$ (mod12(–1) = 11).

Inversion

Melodic inversion occurs when all ascending melodic intervals in a melody are replaced with descending intervals of the same size, and all descending replaced with ascending of the same size. The following melodies are inversion of each other.

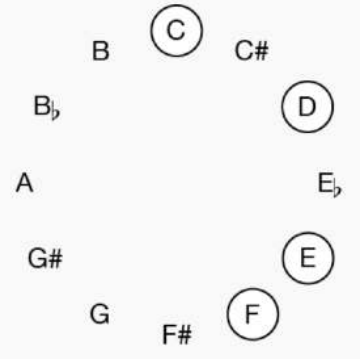


Pitch inversion occurs when all pitches are inverted, or flipped, around an axis of symmetry in pitch space (in other words, the axis of symmetry is a pitch). In the above melodic example, the axis is G4. Since the first pitch is G4, it remains unchanged. The next pitch (A4) is two semitones above G4; it is replaced with F4, two semitones below G4. B4 (i4 above G4) is replaced by E-flat4 (i4 below G4). And so on.

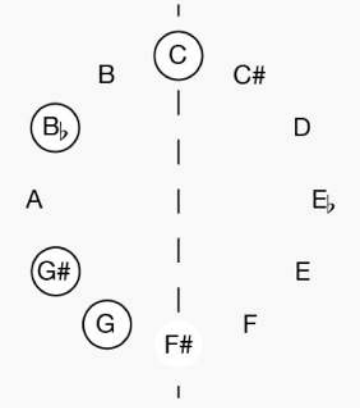
Pitch inversion can apply to a melody, but also to a simultaneity, or to a collection that a passage is based on.

In general, when two melodies, simultaneities, or collections can be related by pitch inversion, they are considered to be equivalent in some sense (but, obviously, not identical).

Pitch-class inversion occurs when all pitch classes of a collection are inverted, or flipped, around an axis of symmetry in pitch-class space (in other words, the axis of symmetry is a pitch class). Since pitch-class space is cyclical (once you go up 12 semitones, you are back where you started), the axis of symmetry is comprised of *two* pitch classes a tritone apart. This is most clearly seen on a clock face.



When the above set is inverted around the axis C/F-sharp, it becomes the following set:



When pitch classes are labeled by number (C = 0, C-sharp = 1, . . . B = 11), pitch class inversion can be calculated by determining a *sum* and finding the difference between that sum and each pitch class in the original collection. The difference is the pitch class for the new collection.

In the above example, the set {C, D, E, F} is {0, 2, 4, 5}. Its inversion {G, G-sharp, B-flat, C} is {7, 8, 10, 0}. When inverting the original around the C/F-sharp axis, C becomes C (0 becomes 0), D–B-flat (2–10), E–G-sharp (4–8), and F–G (5–7). All of these pitch-class pairs add to 0 or 12, which are equivalent modulo12. Thus the inversion sum is 0, and the inversion is labeled $\mathbf{I_0}$.

Inverting about the C-sharp/G axis is $\mathbf{I_2}$. Inverting about the D/G-sharp axis is $\mathbf{I_4}$. Inverting about the E-flat/A axis is $\mathbf{I_6}$. Inverting about the E/B-flat axis is $\mathbf{I_8}$. Inverting about the F/B axis is $\mathbf{I_{10}}$. Odd number sums will place the axis between pitch classes ($\mathbf{I_1}$ between C/C-sharp and F-sharp/G, fox example).

Some atonal composers like to make use of sets that invert and/or transpose onto themselves. Sets that can be inverted around an axis of symmetry without changing any pitch classes are called *inversionally symmetrical*. Sets that can be transposed a certain interval without changing any of its pitch classes are called *transpositionally symmetrical* or *rotationally symmetrical*. The Z-cell and French-Sixth collections are sets that are both rotationally and inversionally symmetrical.

7.8: General Post-Tonal Resources - Analyzing 12-Tone Music

The *pitch* material of a strict 12-tone work is entirely (or nearly entirely) derived from a single *12-tone row*. A row is an *ordered set* of the twelve pitch classes of the chromatic scale. Each of the 12 will appear exactly once, and order is paramount.

12-tone rows that can be related to each other by transposition, inversion, and/or retrograde operations are considered to be forms of the same row. Unless a row has certain properties that allow it to map onto itself when transposed, inverted, or retrograded, there will be 48 forms of the row: *prime* (**P**), *inversion* (**I**), *retrograde* (**R**), and *retrograde inversion* (**RI**) forms, transposed to begin on each of the 12 pitch classes.

Prime form

The prime form of the row is the main form to which all other forms are referenced. In some pieces, one form of the row will clearly dominate the texture. If that is not the case, choose the most salient row at the beginning of the work and label it **P**. If more than one row seem equally salient at the beginning, flip a coin. The decision of which to call "prime" is not always important, but the analysis of the piece depends on a single row form serving as a point of reference.

Any row form that is the same as, or a strict transposition of, that opening prime form is also a prime form. Once you have labeled the main prime form at the beginning of the piece, any subsequent row that is an exact transposition of that row is prime. Likewise, any row that exhibits the same succession of pitch-class intervals is also a prime form.

Since **P** can be transposed to any pitch-class level, we distinguish them with subscripts. There are multiple common systems for deciding the numbering. The simplest, which we will follow in this course, is to number the row by its starting pitch class. If the prime form begins on G (7), it is $\mathbf{P_7}$; on B (11), $\mathbf{P_{11}}$.

Retrograde form

A retrograde form of the row takes a prime form and exactly reverses the pitch classes. Its interval content, then, are the reverse of the prime forms. Retrograde forms are labeled **R** followed by a subscript denoting the *last* pitch class in the row. This will ensure that if two row forms are exact retrogrades of each other, they will have the same subscript.

For example, if a row has the exact reverse interval structure of the prime forms and ends on F-sharp (6), it is $\mathbf{R_6}$, regardless of its first pitch.

Inversion form

A row form that exactly inverts the interval structure of the prime form (for example, 3 semitones up becomes 3 semitones down—or 9 semitones up, modulo12) is in inversion form. Inversion forms are labeled according to the first pitch class of the row form. An inversion-form row that begins on E-flat (3) is $\mathbf{I_3}$.

This label is not always the same as the inversion *operation* that produces it. (See the Analyzing atonal music resource.) If you begin with $\mathbf{P_0}$, the inversion operation and the resulting row form will have the same subscript. Otherwise, they will be different. Take care not to confuse them.

Retrograde inversion

The relationship of retrograde inversion (**RI**) and inversion (**I**) forms is the same as that between retrograde (**R**) and prime (**P**). Retrograde inversion forms reverse the pitch classes of inversion forms and are named for the *last* pitch class in the row form.

Interval progressions

Once you have determined (or decided) which row is *prime*, analyze its interval content in *ordered pitch-class intervals*. This will help you determine if subsequent row forms are **P**, **I**, **R**, or **RI** (or if they do not belong to the same row family).

For example, the row for Schoenberg's Op. 25 is:
[E, F, G, Db, Gb, Eb, Ab, D, B, C, A, Bb].

Its intervals (ascending pitch-class intervals, modulo12) are:
1, 2, 6, 5, 9, 5, 6, 9, 1, 9, 1

(Notice that while no pitch class repeats in the row, several intervals appear more than once.)

The intervals of the inversion form of the row are the same size, opposite direction. You can calculate them by subtracting each of the prime-form intervals from 12:
11, 10, 6, 7, 3, 7, 6, 3, 11, 3, 11

Retrograde intervals are tricky (at first). Reversing pitch classes *changes the direction of each interval*. Thus C–A (9) becomes A–C (3). Thus to get the interval progression of the retrograde forms, reverse the intervals of the *inversion*:
11, 3, 11, 3, 6, 7, 3, 7, 6, 10, 11

(Test this out with the retrograde form of the row: Bb, A, C, B, . . .)

To get the interval succession of the retrograde forms, invert the retrograde interval progression, or reverse the prime interval progression:
1, 9, 1, 9, 6, 5, 9, 5, 6, 2, 1

Take care in determining these first, and it will be easy to classify row forms as you go through a piece. Its interval progression will tell you the type, and the pitch class of the first or last note will give you the subscript. That subscript will tell you the transposition relationship between it and the other row forms of the same type.

7.9: General Post-Tonal Resources - Glossary of Atonal Musical Terms

this glossary is far from complete, in the very early stages of being built

collection – The general term for treating multiple pitch classes as a single entity. Sets, set classes, scales, simultaneities, chords, and intervals are all specific kinds of collections.

interval class – The number of semitones between two *pitch classes*, counted as the shortest distance between them on a clock face. For instance, C and E make an interval class of 4. This is always the case, no matter which *pitch* is higher or lower, because interval class is concerned only with *pitch classes*. Interval classes are labeled **ic1**, **ic2**, . . . **ic6**. (There are none smaller than **ic1** or larger than **ic6**.)

interval vector – The interval vector of a set class describes all of the interval classes present in a set class. There are six interval classes (1–6). The interval vector gives the number of each of those intervals in order from 1 to 6, within angle brackets. An interval vector of **<101102>** means that the set has one ic1 (semitone/major seventh), no ic2s, one ic3 (minor third/major sixth), one ic4 (major third/minor sixth), no ic5s (perfect fourths), and two ic6s (tritones).

ordered pitch interval – The number of semitones from one pitch (not pitch class) to the next. Ascending intervals are denoted by positive numbers, descending intervals by negative numbers. Examples: B4–G5 would have an ordered pitch interval of 8 (eight ascending semitones). B3–G5 would be 20. B4–G4 would be –4.

ordered pitch-class interval – The number of *ascending* semitones from one pitch-class to another. G–B is four semitones, for an ordered PC interval of **4**. B–G is eight ascending semitones, for an ordered PC interval of **8**.

The ordered pitch-class interval is also the modulo12 version of the ordered pitch interval. For example, B4–G4 is –4 semitones (4 semitones down). mod12(–4) = 8. C3–D4 is 14 semitones. mod12(14) = 2.

pitch – A pitch class in a specific register, such as C4 (middle C).

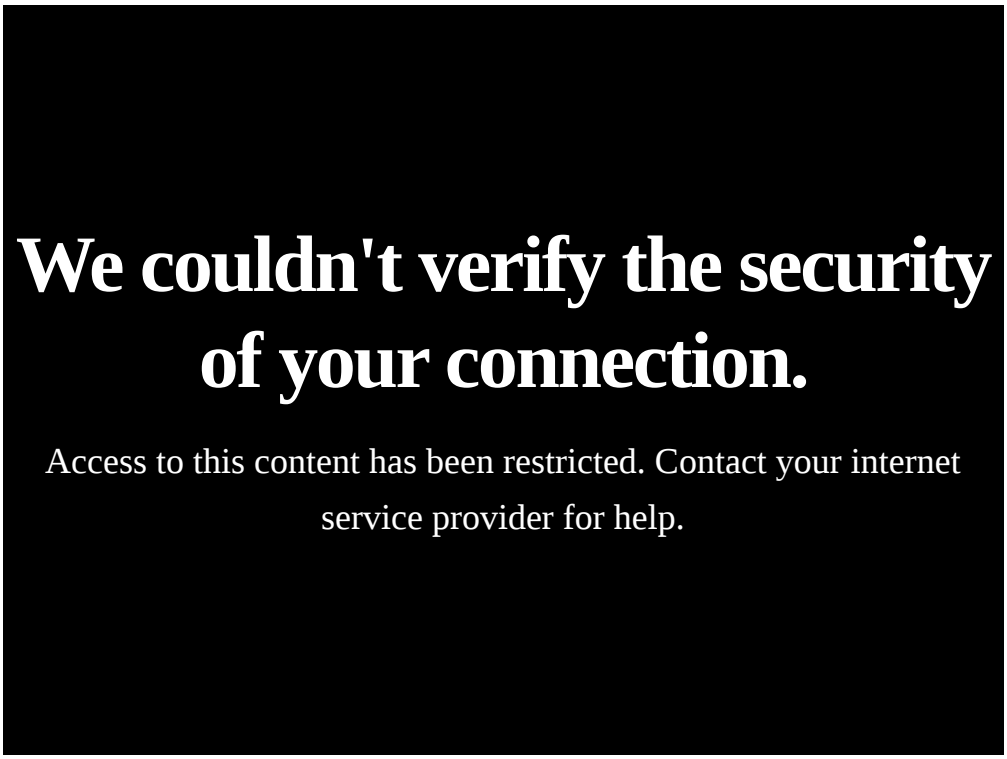
pitch class – One of the twelve steps on the chromatic scale, summarized by a note name (C, D-sharp, B-flat, etc.) or a number 0–11 (C = 0, C-sharp = 1, . . . B = 11). In atonal music, spelling rarely matters except to make performance easier, so enharmonically equivalent pitch classes are considered identical (C = B-sharp = D-double-flat = 0).

pitch-class set – An *unordered* collection of pitch classes, usually grouped into curly brackets: {C, E, G}, {D, E-flat, G}, or {4, 5, 9}.

pitch-class set class or simply **set class** – A category of pitch-class sets that are all related by transposition or inversion. For example, the 12 major triads are all related by transposition. While each major triad is a different pitch-class set, they all belong to the same set class (the same category of sets). Note that minor triads are upside-down major triads (minor third–major third, instead of major third–minor third). Thus since major and minor triads can be related by inversion, they belong to the same set class. Set classes are typically named according to their *prime form* (see *prime form* in this glossary).

prime form – Since set classes come in as many as 24 different forms (12 transpositions times 2 inversions), one of those forms is chosen as its name or referential form, for ease of categorization. That form is the prime form. The prime form is, in a nutshell, the inversion and rotation of the set class that keeps the pitch classes most tightly packed on and above C (0).

For help finding the prime form of a set, Jay Tomlin's set theory calculator can be helpful. The following video demonstrates how to use it.



SetTheoryCalculator from Kris Shaffer on Vimeo.

simultaneity – Any collection of more than one pitch (class) that sound at the same time. This includes dyads/intervals, chords, clusters, and "salami slices" of contrapuntal textures.

unordered pitch-class interval – A regular *simple* chromatic interval: the number of half steps between two pitches. Compound intervals (larger than an octave) are typically reduced to their corresponding simple interval. They are labeled with a lower-case **i**: **i4** is a major third, for example.

7.10: General Post-Tonal Resources - Sheet of Blank Chromatic-Scale Clock Faces

Sheet of blank chromatic-scale clock faces.

8: Pop

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SECTION OVERVIEW

8.1: Pop/Rock Music

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8.1.1.1: Rhythm - Syncopation in Pop/Rock Music

8.1.2: Harmony - Harmony in Pop

8.1.2.1: Harmony - Harmony in Pop/Rock Music

8.1.3: Harmony - The "50s doo-wop" Progression

8.1.4: Harmony - The Singer

8.1.4.1: Harmony - The Singer/Songwriter Chord Progression

8.1.5: Harmony - The "Puff" Progression

8.1.6: Harmony - The Blues Progression

8.1.7: Harmony - The Lament Progression

8.1.8: Harmony - Circle-of-fifths Progression, Minor Mode

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8.1.1: Rhythm - Syncopation in Pop

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8.1.1.1: Rhythm - Syncopation in Pop/Rock Music

Syncopation occurs when a rhythmic pattern that typically occurs on strong beats or strong parts of the beat occurs instead on weak beats or weak parts of the beat. Most pop/rock songs have a mixture of syncopated and "straight" rhythms. The syncopated rhythms are usually easy to sing, since they often match speech better than straight rhythms. However, they are more difficult than straight rhythms to sight-sing, dictate, or transcribe.

Straight syncopations

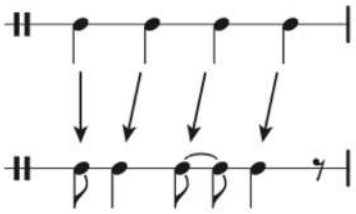
In contemporary pop/rock music, syncopation typically involves taking a series of notes of equal durations, cutting the duration of the first note in half, and shifting the rest early by that half duration.

For example, a series of four quarter notes, all sounding on the beat, can be transformed in this way by making the first note into an eighth note, and sounding each successive quarter note on eighth note early—all on the *offbeats*.

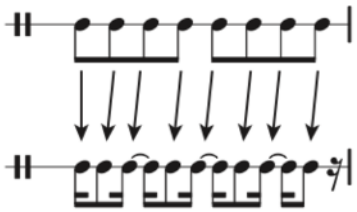
This process can occur on any metrical level. If the duration of the series of "straight" notes is two beats, they will be syncopated by changing the first note to a single beat and shifting each other note early by a beat. If the duration of the straight notes, like the figure above, is a beat, they will be syncopated by a division (one half beat in simple meter). If the straight notes are each divisions, they will be syncopated by shifting each note by a subdivision. The unit of syncopation (the duration of the first note, and the amount of shift applied to the following notes) is always half of the duration of the straight notes. All of these syncopations are realtively common in contemporary pop/rock music.

As a convention, when we take a series of notes that each have a duration of one beat and shift them early by half of a beat, we will call that *beat-level syncopation*. When we take a series of notes that each have a duration of one division and shift them early by a subdivision, we will call that *division-level syncopation*.

Beat-level syncopation.



Division-level syncopation.



(Note the use of ties to make each beat clear. Always do this in order to make it easy to read.)

Transcribing straight syncopations

Straight syncopated rhythms are easily identified by the frequently occurring off-beat rhythms. For example, if you conduct or tap the counting pulse while listening to a song, several notes in a row that are articulated between your taps or conducted beats, with no notes articulated simultaneously with the counting pulse, indicate syncopation.

Once you identify a syncopated passage—which may only involve two or three notes—figure out on what metrical level the syncopation occurs. For example, in simple meter, if no notes are articulated directly on the counting pulse beats and one note is articulated in between each beat, the syncopation is occurring at the beat level. If no notes are articulated directly on the counting pulse beats and *two notes* are articulated in between each beat, listen to the passage again while tapping the *division*. If no notes are

articulated directly on the division taps and one note is articulated in between each tap, the syncopation is occurring at the division level.

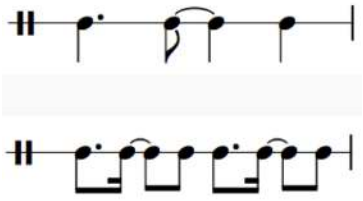
Once you have determined the metrical level on which the syncopation occurs, determine the durational value of the shift. If the syncopation occurs on the beat level (one note sounding between each counting pulse beat), the value of syncopation is a division: each beat-length note has been shifted one division early. If the syncopation occurs on the division level, the value of syncopation is a subdivision: each division-length note has been shifted one subdivision early.

Lastly, determine how the syncopated pattern begins. Does the offbeat pattern simply begin offbeat? Or does the pattern begin with two quick notes back-to-back as above—one short note on the beat followed by the first of the longer syncopated notes?

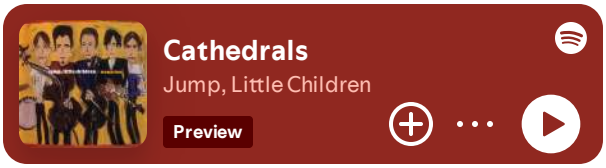
Once you have determined the level of syncopation, the duration of the shift, and whether or not the pattern begins with a truncated onbeat note, the rhythmic pattern should be easy to notate. If, however, you are still having difficulty, try using the lyric syllables and the stress patterns of the lyrics to help you keep track of the individual notes and which ones are on/offbeat. Writing lyrics down before notating the rhythm can be a big help.

Fake triplets

Another common rhythmic pattern in pop/rock is to divide a beat (or two beats) into three almost-equal groups. For example, dividing a half note into two dotted-eighth notes and an eighth note (3+3+2). Since this pattern approximates a triplet while still maintaining the simple division of beats by 2, 4, 8, etc., we can call them *fake triplets*.



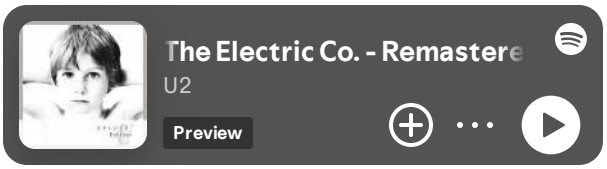
Fake triplets are more common than “real” triplets in most pop/rock genres, but both do occur, so take care to distinguish between the two. “Cathedrals” by Jump, Little Children contains examples of both (as well as some straight syncopation), and is an excellent example for practicing performing and identifying fake and real triplets.



While fake triplets occur most often in 3+3+2 groupings, 3+2+3 and 2+3+3 are also possible.

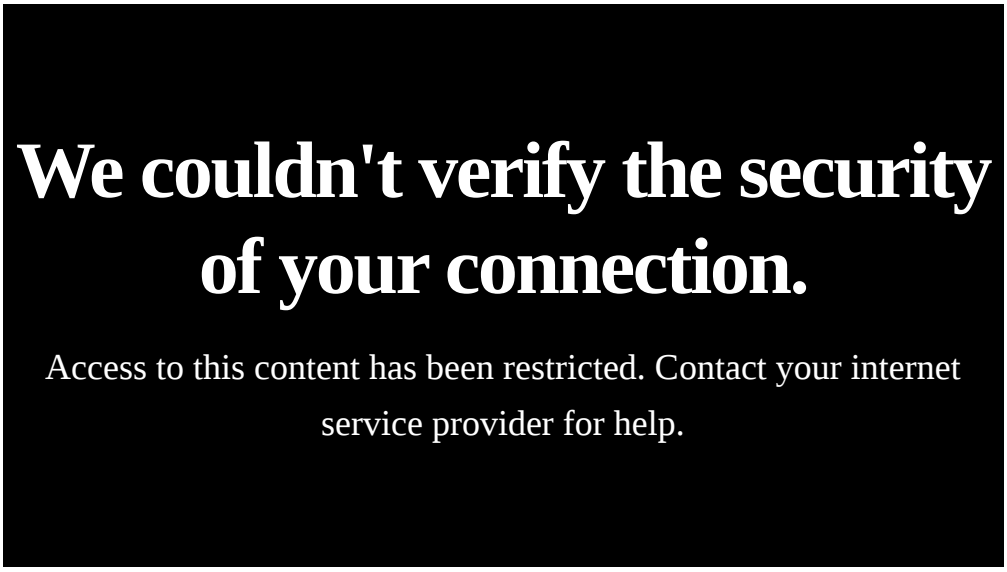
A related pattern is what we might call *fake sextuplets*. Here the 3+3+2 pattern is doubled, resulting in 3+3+3+3+2+2.

In the opening of “Electric Co.” by U2, the guitar plays subdivisions (sixteenths) grouped 3+3+3+3+2+2, while the kick drum plays straight beats (quarters) under the hi-hat playing straight subdivisions.



Demo

The following video walks through the process of transcribing straight syncopations in the song “Shh” by Frou Frou.



8.1.2: Harmony - Harmony in Pop

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8.1.2.1: Harmony - Harmony in Pop/Rock Music

Harmony in pop/rock music does not always follow the same norms and patterns of classical-era music. Thus, functional-bass notation does not work for all situations. Instead, we will primarily use Roman numerals for our analysis of harmony in pop/rock music, occasionally using functional bass as a supplement to help us make sense of a particular harmonic pattern or relate it to what we've studied in classical harmony.

One key difference between rock and classical harmony is that chords in pop/rock music are almost always root-position triads or seventh chords. This affects the "rules" of harmonic syntax, as 6/3 chords in classical progressions are replaced by 5/3 chords in pop/rock progressions. (For instance, the classical progression **IV–IV^6** becomes **IV–VI**. The same bass line does the same work, but by using a 5/3 chord instead of a 6/3 chord, the functional progression changes to something that would "break the rules" of classical syntax.) This can make harmonic analysis a little tricky in pop/rock music, especially since there is no published theory of rock harmony that is equal to Quinn's functional theory of classical harmony. However, it makes chord labeling and harmonic dictation simpler. Most of the time, all you need is the scale degree of the bass.

Following is a chart of bass scale degrees and the roots/Roman numerals most typically associated with them. Keep this chart handy when transcribing and dictating rock harmonic progressions. As you can see, most bass notes typically go with a single chord.

BASS	5/3 OR 7	6/3 OR 6/5
do	I	
re	II	
mi / me	[III]	I
fa	IV	
sol	V	
la / le	VI	[IV]
te	VII	
ti		V

Bass scale degrees and commonly associated harmonies in pop/rock music. Less common chords are enclosed in square brackets.

Harmonic functions in minor

Harmonic functions in minor keys of pop/rock songs, particularly in the last couple decades, tend to deviate from classical syntax in different ways than major-key songs. See the Harmonic functions in minor resource for more details about this.

Schemata

There are a number of common stock chord progressions that recur in many pop/rock songs. Typically, these stock progressions, or schemata, will occur in cyclical patterns; that is, the same progression will repeat multiple times in a row. This is particularly common in choruses of verse-chorus songs, but also happens in verses, strophes, and bridges. This is helpful for identifying harmonies by ear, since in addition to listening for bass scale degrees and considering whether the harmonies are chords of the fifth (5/3 or 7) or chords of the sixth (typically 6/3 or 6/5), we can listen for common patterns that we've heard in other songs. Following are a number of common schemata for pop/rock harmonic progressions.

The "50s doo-wop" progression

||: I – VI – IV – V :||
or
||: I – VI – II – V :||

The "Singer/Songwriter" progression

||: VI – IV – I – V :|| (in major)
||: I – VI – III – VII :|| (in minor)
||: I – V – VI – IV :|| ("With or Without You" variant)
||: IV – I – V – VI :|| ("deceptive" variant)

The "Puff" progression

I – III – IV . . . (to begin a phrase)

The blues progression

||: I - - - | IV - I - | V IV I - :|| (12-bar blues)
||: I - - - | I - - - | IV - I - | V IV I -:|| (16-bar blues)

The Pachelbel progression

||: I – V – VI – III – IV – I – IV – V :||
||: I – V^6 – VI – III^6 – IV – I^6 – IV – V :|| (stepwise bass version)
I – V – VI – III . . . (to begin a phrase; "truncated" version)

The lament progression

||: I – VII – VI – V :||

The circle-of-fifths progression (in minor)

||: I – IV – VII – III :||

Plagal progressions

||: I - IV :||
||: I - bVII - IV - I :||
||: bVI - bIII - bVII - IV - I :||

Rock's "tonal systems"

Walter Everett has posited six *tonal systems* to which most pop/rock songs belong. The following sections summarize four of these with examples (all but 1 and 6—the most and least tonal). See Everett's 2004 article in *Music Theory Online* for a more detailed exploration of these "systems."

System 1: Pop/rock tonality that strongly resembles common-practice classical tonality (major and minor keys, with parallel-key borrowing).

System 2: Pop/rock tonality that draws on diatonic modes (such as Dorian, Mixolydian, Aeolian).

System 3: Pop/rock tonality that strongly resembles common-practice classical tonality, but which borrows from diatonic modes.

System 4: Blues-based pop/rock tonality.

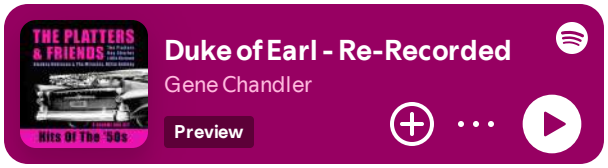
System 5: Minor-pentatonic-based pop/rock tonality.

System 6: Chromatically inflected minor-pentatonic-based pop/rock tonality.

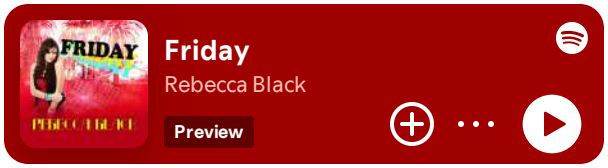
8.1.3: Harmony - The "50s doo-wop" Progression

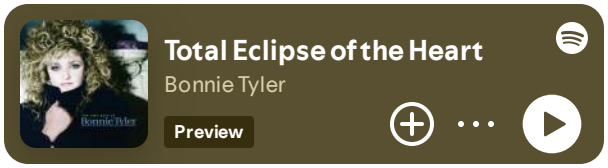
||: I – VI – IV – V :||
or
||: I – VI – II – V :||

This cyclical chord progression was very common in rock ballads from the 1950s and early 1960s, hence the name (example: “Duke of Earl” by Gene Chandler).



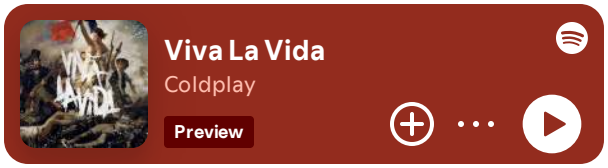
However, it has continued to be used frequently ever since (examples: the verse and chorus of “Friday” by Rebecca Black, the chorus of “Total Eclipse of the Heart” by Bonnie Tyler).





Because it is typically employed in cycles, it can also be found starting on a different chord in the cycle and then proceeding through the same succession of chords. For example, “Viva la Vida” by Coldplay works through a cyclical repetition of the same succession of chords, but their phrases begin on IV rather than I:

||: IV – V – I – VI :||



8.1.4: Harmony - The Singer

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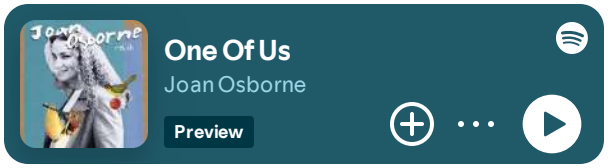
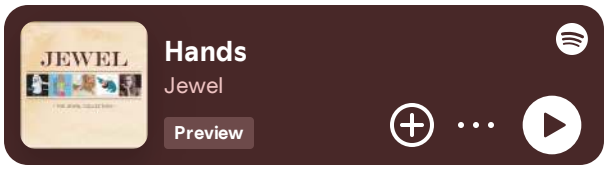
8.1.4.1: Harmony - The Singer/Songwriter Chord Progression

||: VI – IV – I – V :|| (in major)
||: I – VI – III – VII :|| (in minor)

Like the 50s doo-wop, this is a four-chord cyclical progression. It has been around for some time but became increasingly common beginning in the mid-1990s with singer/songwriters such as Sarah McLachlan, Jewel, and Joan Osborne, though the chord progression can be found in a variety of musical styles.





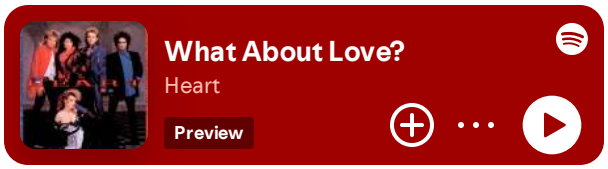
This progression is interesting in two particular ways. First, like the 50s doo-wop, it can begin its rotation in places other than the first chord. For example, U2's "With or Without You" cycles through this progression with phrases starting on tonic:

||: I – V – VI – IV :||

The second interesting feature of this progression is its mode ambiguity. The same chords—depending on the passages before and after a series of repetitions of the progression, and depending on which chords in the cycle begin and end it—can project a feel of major or of minor. In other words,

Am – F – C – G

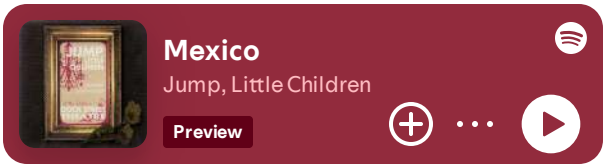
can sound like VI–IV–I–V in C major, or like I–VI–III–VII in A minor. In fact, some songwriters take advantage of this duality in songs that modulate back and forth between relative major and minor keys, as well as in songs with some parallel ambiguity in the text (hence its usefulness for those mid-1990s songwriters). An example is "What About Love" by Heart, which has an obvious D-minor intro, a D-minor/F-major verse using the singer/songwriter progression, and a chorus obviously in F major.



Lastly, we find a "deceptive" variant of this progression from time to time. Here the cycle of chords begins on IV in order to end on V–VI, allowing phrases to end with a deceptive cadence. "Mexico" by Jump, Little Children incorporates this "deceptive" variant (as well as the original version). Listen to the last two phrases of each strophe. Both phrases employ the deceptive variant, except

the final phrase has its last chord elided by the I chord that begins the next module. The result is a phrase ending with a deceptive cadence, followed by a phrase that ends with V–I, or deceptive cadence (DC) => perfect authentic cadence (PAC).

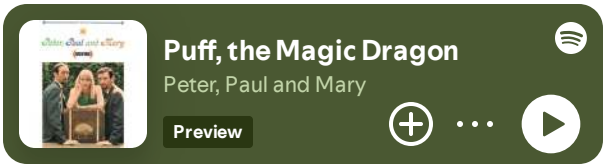
||: IV – I – V – VI :|| (“deceptive” variant)



8.1.5: Harmony - The "Puff" Progression

I – III – IV . . . (to begin a phrase)

The “puff” progression is named after “Puff, the Magic dragon” by Peter, Paul, and Mary, a song that begins with this progression. It does not participate in 3- or 4-chord cycles like the above progressions. However, it is typically bound to the opening of phrases, and typically harmonizes the bass mi/me as III, rather than a first-inversion I. “House of the Rising Sun” by the Animals is an example of this progression beginning phrases in minor (*do–me–fa* . . .).



8.1.6: Harmony - The Blues Progression

A *12-bar blues progression* is composed of three (typically) four-bar phrases. The first phrase is entirely tonic harmony (I). The second phrase contains two bars of subdominant (IV) and two bars of tonic (I). The final phrase begins with one bar of dominant (V) followed by one bar of subdominant (IV) and two bars of tonic (I). The third phrase may or may not end with a *turnaround*.

I / / /	*IV / I /*	*V IV I /*

Because the first phrase starts with I, the second with IV, and the last with V, we can call these phrases the *tonic*, *subdominant*, and *dominant* phrases.

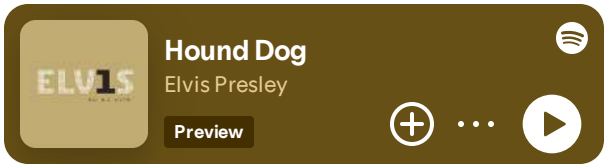
A *16-bar blues progression* is composed of four (typically) four-bar phrases, usually two iterations of tonic, followed by subdominant and dominant. The final phrase may or may not end with a *turnaround*.

I / / /	*I / / /*	*IV / I /*	*V IV I /*

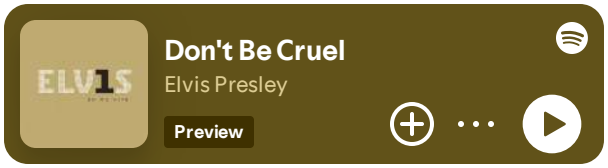
Of the two, 12-bar blues is more common. And though both can be found in modules of all types of functions, blues progressions are most typically found in strophes (both in strophic and in AABA song forms).

Frequently, songwriters will make alterations to the standard harmonic pattern or extend/compress phrases by a bar or two. However, if you hear most of the features above, consider it an altered blues progression and use the standard 12- or 16-bar pattern as a reference for listening to what specific details have been altered.

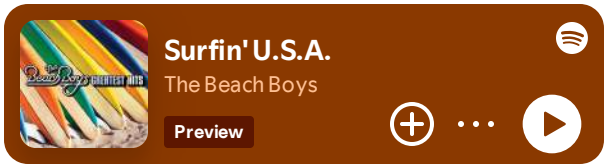
A straight 12-bar blues progression can be found in “Hound Dog” by Elvis Presley.



“Don’t Be Cruel” by Elvis Presley presents a 12-bar blues pattern with an alteration of the final phrase (II–V–I rather than V–IV–I) in the strophes (the song is in AABA form).



“Surfin’ USA” by the Beach Boys presents a 16-bar blues strophe with the two first phrases each beginning on two bars of V before two bars of I (V / I / instead of I / / /).



8.1.7: Harmony - The Lament Progression

||: I – VII – VI – V :||

This progression need not be included in a cycle, but occasionally it does. It is named the “lament” progression because in early classical music, this chord progression (almost always in minor) was used as the *ground bass* (a repeated bass pattern that formed be foundation for a set of variations, not unlike the cyclical progressions of pop/rock songs) for songs of lament. Examples include “Dido’s Lament” by Henry Purcell, from the opera *Dido and Aeneas*, and J.S. Bach’s “Crucifixus,” from his Mass in B Minor.

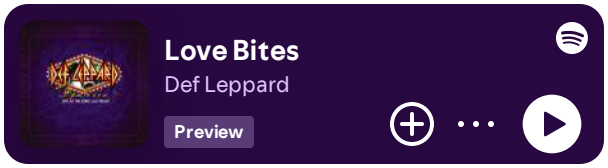
The opening of the verse in Muse’s “Thoughts of a Dying Atheist” is a prominent example from recent pop/rock music (it is followed by a circle-of-fifths progression).

8.1.8: Harmony - Circle-of-fifths Progression, Minor Mode

||: I – IV – VII – III :||

Much more will be said about circle-of-fifths progressions in the context of classical music. In pop/rock music, we will focus on the above four-chord progression. This is considered a "descending" circle-of-fifths progression because each chord's root moves down by fifth to the next root. In pop/rock, this progression often happens in minor beginning on I, moving to the relative major. Like the "singer/songwriter" progression, there is some key ambiguity in this progression, as the starting chord is easily considered tonic, but the motion from VII to III can easily be heard as V–I in the relative major key. And indeed, it can be used to move from the relative minor to the relative major.

Def Leppard's "Love Bites" (mildly explicit lyrics) begins with this four-chord progression repeated twice for the verse.



The verse of Muse's "Thoughts of a Dying Atheist" begins with a lament progression, followed by a four-chord circle-of-fifths progression. This progression immediately repeats, returning to the initial minor key. However, the second time through, this lament–circle-of-fifths pattern leads to a chorus in the relative major (taking the III chord as the new tonic).

For a complete circle-of-fifths progression, see Gloria Gaynor's "I Will Survive":

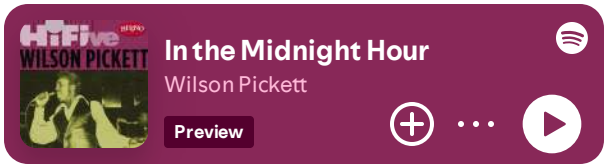
||: I – IV – VII – III – VI – II – V / :||

8.1.9: Harmony - Plagal Progressions

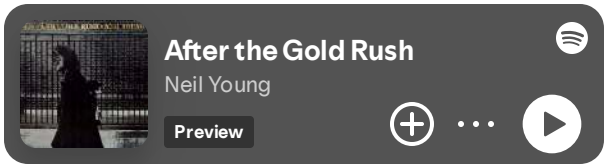
The IV chord, while certainly an extremely frequent predominant/subdominant chord in common-practice repertoire, has an even more prominent place in pop/rock music. Perhaps borne out of the 5-6 neighboring motion found in shuffle-blues guitar accompaniment patterns, an alternation between I and IV is a common occurrence in numerous genres.

In “Soul Man” by Sam and Dave, the chord progression used in the verse consists of an alternation of I and IV (listen carefully to the bass).

A similar oscillation between I and IV can be found in the verse to “In the Midnight Hour” by Wilson Pickett.

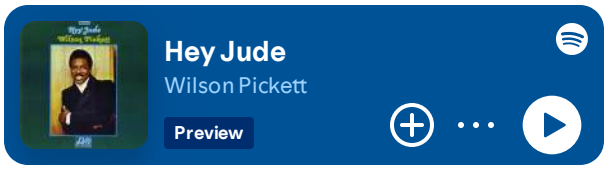


This kind of chord progression isn’t limited to Soul and R&B, of course. The beginning of “After The Gold Rush” by Neil Young features a similar progression (it deviates after the the words “…drummers drummin…” Also, note the discrepancy between the melody notes and the chords throughout).



Double-plagal progression

The “double-plagal” progression (Walter Everett’s term) is an expansion of the plagal progression discussed above to include the “IV/IV” chord prior to the IV chord. This is perhaps more simply explained as bVII-IV-I (or simply VII-iv-I in minor). The most famous instance of the double-plagal progression is likely the coda from “Hey Jude” by The Beatles, performed here by Wilson Pickett:



Extended plagal progressions

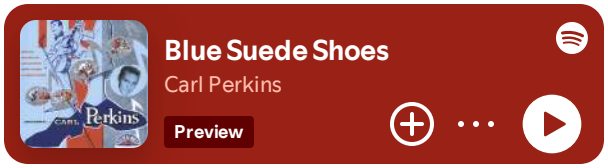
The “applied IV” chord can be used in sequence, similar to the descending-fifths progression in common-practice music. In the version of “Hey Joe” by Jimi Hendrix, the verse consists of three iterations of the plagal motion in a descending-fourths pattern, which results in the progression: bVI-bIII-bVII-IV-I, in the key of E major.

8.1.10: Form - Overview

Pop/rock songs of the late twentieth century tend to follow one of three large-scale structural patterns.

Strophic form

Consider “Blue Suede Shoes” by Carl Perkins. This song contains multiple *modules*, all of which have the same basic underlying music. Though the instrumentation and the lyrics change, the section beginning at 0:19 contains the same – or, at least, very similar – melody, harmony, and phrase structure as the sections that begin at 0:58, 1:37, and 1:54. Listening a bit more closely, we can hear a similar, but abbreviated, version of the same patterns at the opening of the song. Even the instrumental sections at 0:41 and 1:21 have the same underlying pattern, just a different melody in the form of a guitar solo. The entire song is a repetition of this same basic pattern, or slight variations of it, modeled at 0:19–0:41. Songs that follow this structure of repeating the same basic multi-phrase unit throughout are called *strophic* songs. The form is called *strophic form* (sometimes abbreviated AAA, because the same basic material A is repeated), and the basic unit that is repeated is called a *strophe*. Strophic form is more common in early rock-and-roll (1950s–1960s) than in the 1970s and beyond.



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And here is a bird’s-eye-view sketch of the form of “Blue Suede Shoes” to follow as you listen:

- 0:00 – Strophe 1
- 0:19 – Strophe 2
- 0:41 – Instrumental strophe
- 0:58 – Strophe 3
- 1:21 – Instrumental strophe
- 1:37 – Strophe 1 (slightly varied repetition)
- 1:54 – Strophe 4

While “Blue Suede Shoes” is composed entirely of strophes, it is important to note that strophic songs can also contain *auxiliary modules* such as intros, outros, and codas. However, if a song has more than one main musical idea other than strophes and auxiliary modules, it is not strophic, but likely one of the following two forms.

32-bar song form (AABA)

Another formal structure that is more common in early rock-and-roll is AABA form, also called 32-bar song form because of some of the features of earlier “Golden Age” songs that make use of this structure.

Consider “I Want to Hold Your Hand” by The Beatles. After a brief introduction, the song begins with two strophes. However, where “Blue Suede Shoes” followed with an instrumental strophe, The Beatles move to a *bridge* at 0:52. This new section builds tension by contrasting and withholding the main strophe theme before it returns at 1:11. Note that the song begins and ends with the strophe, and the strophe contains the title lyrics. It also, for many people, is the more memorable part of the song. Thus, the strophe is still the *primary* module. But now it has a *secondary* module to add interest and tension, the bridge. (And an auxiliary module, the intro, to help get the song off the ground.)

Here is a bird’s-eye-view sketch of the form of “I Want to Hold Your Hand”:

- 0:00 – Intro
- 0:08 – Strophe 1 (A1)
- 0:29 – Strophe 2 (A2)
- 0:51 – Bridge (B)

- 1:11 – Strophe 3 (A3)
- 1:33 – Bridge (B)
- 1:53 – Strophe 3 (A3)

There is no legal, open-access, embeddable audio for this song. However, it is easy to find, if you don't already own a recording.

"I Want to Hold Your Hand" is a typical AABA song in that it does not just have four modules, AABA. AABA songs almost always have a complete AABA *cycle*, followed by either another complete AABA cycle, or an incomplete cycle (typically BA). Once the first AABA cycle is complete, there tend not to be any new lyrics, only repetition of the whole or the end of the main cycle.

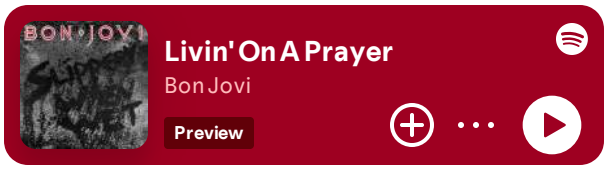
The convention is to label cycles with curly brackets: {}. So the large-scale form of "I Want to Hold Your Hand" is

> *{AABA}{BA}*

Verse-chorus form (VC, VCB)

The last of the three main form types, *verse-chorus form* is a versatile song form that rapidly took over rock-and-roll in the 1960s and has dominated the genre ever since. Like AABA form, verse-chorus form has multiple *core* (non-auxiliary) modules. However, where the title lyrics, the most memorable music, and the main narrative all tend to take place in the strophe of an AABA song (which both begins *and* ends the song), in verse-chorus form, those features are split between the verse (a secondary module, which contains the main narrative text, and which begins the song) and the chorus (the primary module, which contains the title lyrics, the most memorable melody, and which ends the song).

Consider Bon Jovi's song "Livin' on a Prayer." After an extended intro, the first cycle begins with a verse at 0:47. Then at 1:18 a *prechorus* increases energy and tension into the chorus at 1:34. After a brief mid-song introduction, this cycle is repeated beginning at 1:54, with the addition of a *postchorus* at 2:56. A final cycle at 3:00 is atypical and abbreviated, and if followed by a repetition of its final chorus multiple times, during which a fadeout ends the song.



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Like "Livin' on a Prayer," a verse-chorus song's formal cycle will contain at least two core modules—verse (V) and chorus (C), with the chorus module being the primary module. Other possible modules in the cycle exhibit prechorus (P), bridge (B), and postchorus (Z) functions.

A full cycle containing all modules except for B would be {VPCZ}. These four functions always progress in this order, though not all need be present. Bridge modules are somewhat flexible. If a song has single bridge module, it tends to appear once, followed by the last chorus, or the last prechorus and chorus, of the song. Bridges often appear in place of the verse and/or prechorus modules in the last cycle, not as an extra element. Thus, songs that incorporate all five core module types rarely will place all five in a single cycle.

Common non-bridge cycles include {VC}, {VPC}, and occasionally (especially as the first cycle in a song) {VVC}, with Z potentially added to the end of any. Common cycles including bridge are {BC} and {BPC}, with Z potentially added to the end of either.

Simple verse-chorus form

Simple verse-chorus form is a term coined by John Covach, referring to songs in verse-chorus form where the harmonic progression underlying the verse is the same as that underlying the chorus. A prime example of this is U2's "With or Without You."

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Super-simple verse-chorus form

Super-simple verse-chorus form is a term coined by Jay Summach (based on Covach's), referring to songs in verse-chorus form where both the harmonic progression and the melody are both the same for verse and chorus (Summach, p. 322).

Going into detail

The following sections go into greater detail about these large-scale structures and the component structures that make them up. Terms, concepts, definitions, and notational guidelines in OMT are taken either from common convention; the published or unpublished work of Jason Summach, John Covach, Walter Everett, Mark Spicer, or Daniel Harrison; or some combination thereof.

- Terminology and basic concepts
- Formal containers and module structures
- Formal functions
- Analytical notation

8.1.11: Form - Terminology and Basic Concepts

This document is a glossary of terms and concepts that we will use in our analysis of pop/rock music. Terms, concepts, definitions, and notational guidelines in this document are taken either from common convention; the published or unpublished work of Jason Summach, John Covach, Walter Everett, Mark Spicer, or Daniel Harrison; or some combination thereof.

Poetic terminology

Foot

A combination of two or three syllables: typically one stressed syllable, and one or two unstressed syllables. Common poetic feet include the *iamb* (unstressed – stressed), the *trochee* (stressed – unstressed), the *spondee* (two stressed syllables in a row), the *anapest* (stressed – stressed – unstressed), and the *dactyl* (stressed – unstressed – unstressed.)

Line

A group of poetic feet functioning as a single unit. Each poetic line is given its own line as printed/written text. If the line is part of rhyming poetry, the last syllable/foot participates in a rhyme with another line. (Internal rhyme is also possible.)

Couplet

A pair of lines. If poetry is rhyming, the two lines making up a couplet typically rhyme with each other. They may also participate in a larger rhyme scheme (see quatrain below).

Quatrain

A pair of couplets (i.e., four lines). Common quatrain rhyme schemes are *aabb*, *abab*, *abcb*.

Stanza

A set of poetic lines that work together as a single narrative unit. Typically one or more quatrains (i.e., total number of lines are a multiple of four).

Example

Following is a stanza from U2, “Pride (In the Name of Love).” This stanza is a quatrain composed of four lines. The first and third lines have four feet (that is, four stressed syllables) with irregular rhythm. The second and fourth lines have three feet with irregular rhythm, and they rhyme with each other.

> *One man come in the name of love.*
> *One man come and go.*
> *One man come, he to justify.*
> *One man to overthrow.*

Other structures

For more poetic structures and terms, see Vanier College’s resource, Poetry’s Structure and Form.

Descriptors & rhetorical devices

Lyric-variant

A module or phrase is lyric-variant if each time it appears it brings (mostly) different lyrics.

Lyric-invariant

A module or phrase is lyric-invariant if each time it appears it brings (mostly) the same lyrics. Lyric invariance tends to come at points of formal closure (tail refrains at the ends of strophes, choruses at the end of a verse-chorus song’s formal cycle).

Music-variant

A module or phrase is music-variant if each time it appears it brings (mostly) different music.

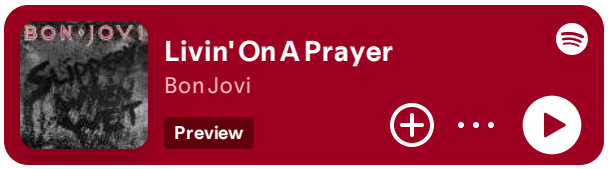
Music-invariant

A module or phrase is music-invariant if each time it appears it brings (mostly) the same music.

Chorusification

Jay Summach uses the term “chorusification” (p. 321) to describe a process where modules are stripped away from the formal cycle until only the chorus module (C) remains. For example, a song that begins with the cycle {VPC} may appear near the end of the song without the verse {PC} and then again without the prechorus {C}. This process is part of a goal-directed progression toward the end of the song, giving special emphasis to the chorus.

Bon Jovi’s “Livin’ on a Prayer” is a good example of chorusification. The first two cycles are similar in length and content, but the third cycle (beginning at 2:58) replaces the verse with an instrumental chorus, giving the third cycle two choruses. After this cycle closes, the chorus repeats forming a chorus-based outro.



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Harmonic aspects of form

On-tonic

A phrase or module is on-tonic when it begins with tonic harmony (I in root position).

Off-tonic

A phrase or module is off-tonic when it begins on a harmony other than tonic.

Harmonically closed

A phrase or module is harmonically closed when it ends with tonic harmony (I in root position).

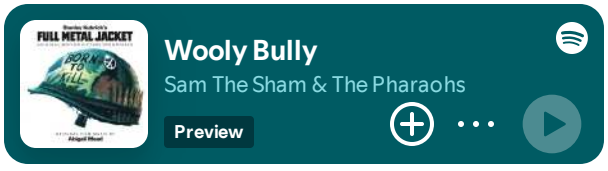
Harmonically open

A phrase or module is harmonically open when it ends on a harmony other than tonic.

Turnaround

The use of a non-tonic chord (usually dominant) at the end of a harmonically closed unit to transition into the beginning of the following on-tonic unit.

The song “Wooly Bully” by Sam the Sham and the Pharoahs contains a turnaround at the end of many of its strophes. One of these occur at 0:54 — a simple V^7 chord to prepare the return of I as the next strophe begins.



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Spotify URI: spotify:track:2XkuSbp5say8nZW8g6156Z

Interestingly in this song, the guitarist doesn't always remember the turnarounds. Notice that at 0:28 the bass and baritone saxophone play the dominant, but the guitarist keeps tonic. At 1:18, the singer yells, "Watch it now! Watch it! Watch it!" as if warning the guitarist not to miss the turnaround in the next bar. He does the same in 2:08. When the guitarist gets the turnaround with the rest of the band, the singer yells, "You got it! You got it!" as if congratulating the guitarist.

Back to pop/rock form overview.

8.1.12: Form - Formal Containers and Module Structures

Formal Containers

Phrase

A phrase is a musical unit that typically lasts for four bars and includes one line of poetry for its lyrical content. Phrases are designated by lower-case letters.

Module

In pop/rock music, a *module* typically spans between 8 and 24 bars and includes 2–4 phrases. (Some auxiliary modules may contain a single phrase.) A module presents a single formal function (such as A, B, C, V, P, etc.) and presents a complete 2-, 3-, or 4-part pattern. Modules typically set a stanza of lyrics.

Module boundaries are usually made apparent by poetic structure (end of a group of rhyming lines—couplet or stanza) or surface features of the song (clear rhythmic, harmonic, and melodic arrival; change in instrumentation or volume; return to beginning of a previously heard module; etc.).

For instance, take the transition from a *verse* module to a *chorus* module at 2:42 in U2's "Pride (In the Name of Love)." The module boundary is delineated by a number of features simultaneously:

- The text closes out the verse's quatrain with a (more-or-less) rhyming lyric ("sky"–"pride") before beginning a new stanza.
- The end of the verse is signaled by a drum fill, a common end-of-phrase or end-of-module gesture.
- The general dynamic gets louder very quickly.
- The guitar becomes more active, and is doubled by a second guitar part.
- The lead vocals rise in register.
- Background vocals are added to the lead vocal part.

All of these features help delineate the boundary between modules, and most of them also give the new module (the chorus) a higher eneregy level than the previous module (the verse).

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All module definitions are based on Jason Summach's (2012) dissertation, "Form in Top-20 Rock Music, 1955–89."

Primary module

"A module that contains a song's principal materials" (Summach, p. 322), such as the title text or the most memorable or climactic music. Primary modules exhibit strophe function (A) or chorus function (C). See Formal functions for more details on these specific functions.

Secondary module

A secondary module is a core module that creates a contrast with the primary module or draws attention to it (see Summach, p. 322). Secondary modules exhibit bridge function (B), verse function (V), prechorus function (P), or postchorus function (Z).

Core module

Core modules form the main musical and poetic content of a song. All primary and secondary modules are considered core modules. (See Summach, p. 321.)

Auxiliary module

Auxiliary modules help frame the core modules, introducing them, providing temporary relief from them, or winding down from them. They exhibit introduction function (I), outro function (O), or coda function (X). (See Summach, p. 321.)

Cycle

"The characteristic succession of modules in a song form, ending with the song's primary module type" (Summach, p. 321). A cycle contains one or more modules, typically in the same order (though sometimes with one or more modules omitted, especially toward the end of a song). Curly brackets {} are used to refer to cycles (to differentiate them from names of song form types).

A strophic song's cycle is {A}. Since there is only one module in a strophic cycle, analysis of the cycles is trivial and can be easily passed over.

A 32-bar song's cycle is typically {AABA}, though abbreviated cycles are common, especially later in the song. "I Want to Hold Your Hand" is a typical example, where a complete {AABA} cycle is followed by an abbreviated {BA} cycle (see Pop/rock form overview for a detailed explanation):

> *{AABA}{BA}*

A verse-chorus song's main cycle is typically {VC} or {VPC}. When a bridge occurs in the song, it often replaces V or VP. Postchoruses (Z) can also follow the chorus.

Bon Jovi's "Livin' on a Prayer" (discussed in the Pop/rock form overview) contains a moderately complex set of cycles:

> *I {VPC} I {VPCZ} {C_iPC} O*

Note the use of a mid-song introduction between cycles, and the use of an instrumental chorus (guitar solo) to begin the third cycle, where we might also expect a bridge. The outro is chorus-based, simply a repetition of the chorus — an example of chorusification.

Module structures

Two-part (aa')

A module is two-part when the phrases that make up the module can be grouped into a first half and a second half. In two-part modules, the second half is usually based on the same music as the first half, and thus it is labeled *aa'*. Often these two halves begin the same but have different endings, participating in an antecedent–consequent (weak → strong) relationship.

The chorus to "Livin' on a Prayer" has an *a a'* structure. The first four-bar phrase ("Oh, we're half-way there…") and the second four-bar phrase ("Take my hand…") have identical melody and harmony (hence the *a*), but different lyrics (hence the *prime*). Note that in many songs, this relationship is not as clear cut. However, if the two phrases *begin* with *similar* musical material, give them the same letter. New lyrics, new musical endings, or musical variations simply warrant a "prime."

Two-part – ab

Very rarely a module's phrases can be grouped into two clear halves based on different music. Such a module is labeled *ab*.

Three-part – aa'b

A module containing three phrases is a three-part module. If the first two phrases are based on the same music, the module is labeled *aa'b*.

12-bar blues progressions are the most common example of a three-part *aa'b* module. "Hound Dog" (on the blues-progression page) contains aa'b strophes.

Three-part – abb'

If the second and third phrases in a three-part module are based on the same music, the module is labeled *abb'*.

Four-part – srdc

A module composed of four phrases often contains a sentential structure (presentation → continuation → cadential/conclusion). In pop/rock music, this often appears as a basic musical idea in the first phrase, a repetition or "response" to it in the second,

contrasting material in the third phrase (often employing fragmentation, acceleration of harmonic rhythm, and movement away from tonic harmony), and a conclusion in the fourth phrase — either with a return to the basic idea and tonic harmony or with still newer material that forms a strong melodic, rhythmic, and harmonic conclusion. Walter Everett has called such a four-phrase sentential structure in pop/rock music *srdc* (statement, restatement/response, departure, conclusion).

In conventional lettering, an *srdc* module could employ an *aaba* structure (with statement material returning as a restatement and again as the conclusion), or *aabc* structure (where the conclusion material is new). Occasionally *abcd* or *abca* are possible, but only if *b* is a clear response to *a*, not simply new material.

srdc structures tend to divide neatly into halves: *sr* and *dc*.

Carl Perkins's "Blue Suede Shoes" contains a clear *srdc* structure in its second strophe (0:19; find a recording and complete module analysis on the Pop/rock form overview). It contains four four-bar phrases (following a 16-bar blues structure). The first two phrases (statement–restatement) contain the same harmony (tonic prolongation), melodies which begin identically, and though the lyrics differ, the rhythmic and rhyme schemes are the same. The third phrase (departure) brings a new melody, new harmony (move to the subdominant), and the title lyrics (this is a refrain shared with other strophes in the song). The final phrase (conclusion) closes out the poetic unit and the blues harmonic progression.

Back to pop/rock form overview.

8.1.13: Form - Formal Functions

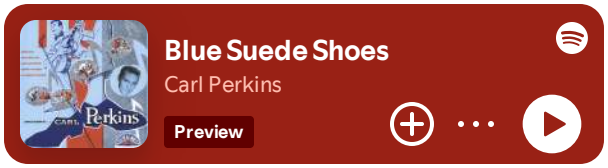
Functions for Primary Modules

Strophe (A)

The primary function of a strophe module is “to present the primary lyric and musical content and to provide a point at which the song might satisfyingly end” (Summach, p. 58).

In strophic form (AAA), strophes are the only core modules, and thus do not participate in a functional progression. Functional progression takes place on the phrase level within the strophe. The strophe modules themselves tend to set a stanza of text each with music that is self-contained and harmonically closed.

See Carl Perkins’s “Blue Suede Shoes” for strophe examples.



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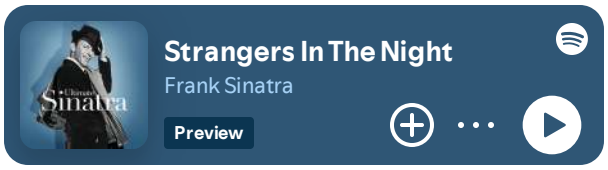
- 0:00 – Strophe 1
- 0:19 – Strophe 2
- 0:41 – Instrumental strophe
- 0:58 – Strophe 3
- 1:21 – Instrumental strophe
- 1:37 – Strophe 1 (slightly varied repetition)
- 1:54 – Strophe 4

In 32-bar form (AABA), the strophe’s function as holding the *primary* text and music, and its function as being a stable point of departure and return, are elevated through contrast with the bridge module. In AABA songs, strophe function often involves the prolongation of tonic harmony. Strophes tend to be longer in strophic songs than in AABA songs. In both forms, *srdc* is by far the most common internal pattern for strophes. For three-part strophes, the 12-bar blues progression is the most common pattern.

Frank Sinatra’s “Strangers in the Night” is in AABA form. Its first two strophes begin at 0:10 and 0:31.



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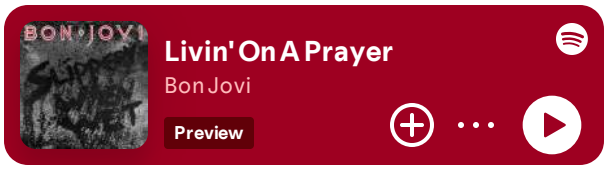
Chorus (C)

Chorus modules are lyric-invariant and contain the primary lyrical material of the song. Chorus function is also typified by heightened musical intensity relative to the verse, including features like “a more dense or active instrumental texture; prominent background vocals; and/or a higher register melody” (Summach, p. 106). Choruses most frequently (but not exclusively) begin on-tonic.

Chorus modules are distinct from refrains primarily by virtue of their being modules in and of themselves, where refrains are contained within a module.

An example chorus can be found at 1:34 in Bon Jovi’s “Livin’ on a Prayer.”



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Spotify URI: spotify:track:0J6mQxEZnlRt9ymzFntA6z

Functions for Secondary Modules

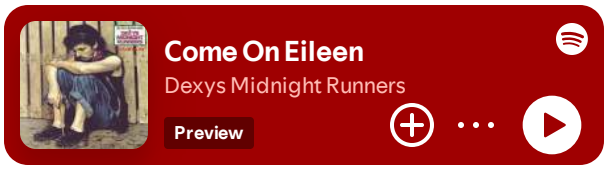
Bridge (B)

Bridge function shares many traits with the continuation function of classical form. Bridge modules tend to play a transitional role (neither the point from which to depart, nor the point of arrival) in the formal cycle, generating high expectation for the return of the primary module (A or C) by contrasting with it and temporarily withholding it. A bridge module "must be followed by [the primary module] in order for its function to be satisfied" (Summach, p. 79), though it is possible for a bridge module in VC form to lead into a final verse module or even a mid-song introduction (see U2's "Pride (In the Name of Love)"). Bridge modules tend to emphasize non-tonic harmonies and commonly end on dominant harmony.

In VC songs, bridge modules are more free to contrast verse and chorus modules without a strong need to build expectation for the return of the chorus than in AABA form. In an AABA song, building expectation for the return of the strophe and arriving on dominant harmony in preparation of that return are essential to bridge function.

See "Strangers in the Night" (audio above) or the Beatles' "I Want to Hold Your Hand" for examples of bridges in AABA form.

"Come On Eileen" by Dexy's Midnight Runners contains an example of a bridge module in a verse-chorus song at 2:55. It finishes with a *climb* borrowed from the verses at 2:55, and sets up a chorus arrival at 3:34.



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Verse (V)

Verse modules are lyric-variant and often contain lyrics thatadvance the narrative. Until the 1960s, verse modules tended to be harmonically closed. Beginning in the 1960s, verse modules became more and more likely to be harmonically open (Summach, p. 114). Verses (like strophes) tend to begin on-tonic.

The first and second verses to "Livin' on a Prayer" (audio above) begin at 0:44 and 1:52, respectively.

Prechorus (P)

Prechorus function is most significantly typified in energy gain. Prechorus modules originate historically in the *d* (departure) section of an *srdc* pattern. (Think of an *srdc* strophe becoming longer until *sr* forms its own two-part verse module (or two successive verse modules), *d* forms its own prechorus module, and *c* forms its own chorus module.) As a result, prechorus modules bear many of the functional characteristics of *d*—fragmentation, acceleration of harmonic rhythm, and movement away from tonic harmony—and harmonic openness.

The first prechorus module to "Livin' on a Prayer" (audio above) begins at 1:15.

Postchorus (Z)

A short module that follows a chorus and serves only to close the cycle (not to introduce or transition to the beginning of the next cycle) has postchorus function (Mark Spicer 2011, par. 9).

The second cycle of “Livin’ on a Prayer” (audio above) ends with a brief, two-bar postchorus at 2:54.

Functions for Auxiliary Modules

Introduction & mid-song introduction (I)

Introductions tend to be short and untexted (i.e., instrumental) and tend to present musical material from one or more core modules to come. Introduction modules transition from the unmetered silence that precede the song to the musical activity of the first core module. This is often accomplished by the introduction of musical material in layers (e.g., one instrument at a time) or a more generic building of energy. Occasionally intros include non-core material. Such intros often correspond to an outro based on the same material, and together they create a “bookend” effect.

It is also possible to have multiple intro modules in a row, with each based on different music. Such a succession of intros would be labeled I1, I2, etc. Dexy’s Midnight Runners’ “Come On Eileen” (audio above) contains several different intro modules with different musical content.

Mid-song intros function similarly, but in the middle of the song. They usually introduce the first module in the formal cycle. “Livin’ on a Prayer” has a brief mid-song introduction at 1:48, which sets up the arrival of the second cycle (beginning with Verse 2). A more extended mid-song introduction comes at 1:57 of “Pride (In the Name of Love)” by U2, which sets up the verse that begins the final cycle.

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Outro (O)

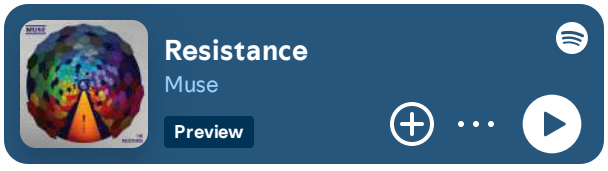
Outros function as a transition from song back to silence, and thus decrease energy. Often this is accomplished in the recording studio by way of a fadeout. When an outro module is present, it is almost always based on material from the last core module that preceded it. Non-core outros tend to draw material from a non-core intro (the above “bookend” effect). “Rock songs almost always end with material that has been heard earlier in the song: either a core module, a core-based auxiliary module, or a reprise of the introduction” (Summach, p. 47). Outros exhibit closing rhetoric (see below).

(See below for an example.)

Coda (X)

A coda is a “song-ending module that presents new material” (Summach, p. 47)—in other words, an outro not based on music previously heard. Like outros, codas exhibit closing rhetoric (see below).

Muse’s “Resistance” has both a coda and an outro. The coda, which contains new musical and narrative material, begins at 4:05, following the final chorus. This new module, which brings something of a conclusion (if an open-ended one) to the narrative, gives way to a song-ending outro at 4:54. Aside from the clear change in content and texture at 4:54, what makes this a clear change from coda to outro is the return of material from the introduction, creating the “bookend” effect that is common from intros and outros working together.



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Closing rhetoric

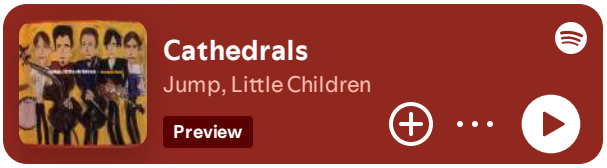
Closing rhetoric involves common patterns and techniques that signal that the end of the song is likely coming soon. Typical patterns and techniques include immediate repetition of a core module (except for the first core module) or part of a core module, thinning out of the texture, late-song intensification, fadeout, and bringing a previously harmonically open module to a point of harmonic closure. Closing rhetoric is typically found in outros, codas, and the last core module of a song (A or C).

Functions for Standout Passages Within Modules

Refrain

"A lyric-invariant passage within a module that is otherwise lyric-variant" (Summach, p. 322). Like a climb (below), a refrain is too short to form its own module—typically a phrase or less. A refrain is most often the last line or so of a module's text (*tail refrain*), and occasionally the material at the beginning of a module's text (*head refrain*).

"Cathedrals" by Jump Little Children contains a head refrain. Each strophe begins with the same line, "In the shadows of tall buildings…"



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Spotify URI: spotify:track:2wd52lU3agY0P3x2hxPYhm

"Blue Suede Shoes" (audio above) and "I Want to Hold Your Hand" both contain tail refrains at the ends of their strophes, emphasizing the title lyrics.

Climb

"A phrase with prechorus function, but of insufficient length to detach from the verse as a separate module" (Summach, p. 321). Always the last phrase of a verse module.

"Come On Eileen" (audio above) contains a one-phrase climb at the end of its verses and bridge ("Tu-ra-lu-ra…").

Back to pop/rock form overview.

8.1.14: Form - Analytical Notation

Following are notational conventions for analyses of musical form.

Capital letters

Modules are labeled with capital letters according to function. A module that functions as a strophe is labeled with an “A”; a module that functions as a bridge, “B”; etc.

Lower-case letters

Phrases are labeled with lower-case letters according to their musical content. If two phrases use more-or-less the same musical framework (harmony, melody, and rhythm), they receive the same letter. Letters are assigned in the same manner as poetic rhymes: the first phrase is *a* and any phrase that follows based on the same music is also *a* (primes are used for slight variations, such as new text or altered instrumentation); the next phrase with new musical material is b; and so on. These letters do *not* correspond to functions.

The single exception to this convention is when phrases within a module demonstrate a sentential progression (*srdc*), in which case the first phrase (statement) is labeled *s*; restatement/response, *r*; departure, *d*; conclusion, *c*.

Full-sized numerals

Full-sized numerals are attached to capital letters when there are two or more modules with the same function but different music. For example, if a song contains two different melodies that both function as verse themes, they are labeled “V1” (the one that appears first in the song) and “V2.”

Subscript numerals

Subscript numerals are attached to capital letters when there are two or more modules with the same function and music but different text. For example, if a song contains three verses, and they all have different lyrics but the same music, they are labeled “V_1”, “V_2”, and “V_3”.

Timeline notation

Variations Audio Timeliner does not support subscripts. It is fine to use full-sized numerals for both purposes if making timelines in VAT.

Back to pop/rock form overview.

CHAPTER OVERVIEW

9: Text and Music

9.1: Analyzing Poetry

9.1: Analyzing Poetry

This resource created by Jonathan Sircy, Department of English, Charleston Southern University.

What is poetry?

We can distinguish *poetry* from *prose* by its

- preference for formal organization,
- intensely conveyed emotions and images,
- and concentrated use of language.

Poetry favors the concrete and particular over the vague and abstract. Poetic language isn't disconnected from normal communication. Rather, it conveys ideas and emotions with greater precision than everyday language.

How can we analyze poetry?

There are several ways to skin the poetic cat. What follows are four large categories with accompanying questions that can help us systematically interpret a poem. Not only are these categories not mutually exclusive, they are often complementary.

STRUCTURE

If we pay attention to a particular poem's meter, tone, imagery, and figurative language, we are able to talk about a poem's *unity*. This attention to structure starts from the premise that each of the poem's parts work together organically (rather than, say, mechanically) to achieve a unified goal. If we were to put that goal into a single sentence, we would have the poem's *theme*, a succinct statement of the poem's central idea and emotions.

Chief question: What idea or emotion UNIFIES the poem's different parts?

Key terms: meter, tone, imagery, figurative language

Meter: the pattern of accented and unaccented syllables in a given poetic line
Tone: the speaker's attitude toward his subject, audience, or himself
Imagery: the poetic representation of any sense experience
Figurative language: the non-literal use of language to achieve an effect

HISTORICAL CONTEXT

When we pay attention to a poem's structure, we pretend that it is an artifact that can be separated from the outside world. But every literary work had an author and an audience, and both are deeply influenced by a particular place and time. This not only affects the way we read poetic allusions but the way we interpret particular words.

Chief Question: How do the poem's words reflect the cultural context of the author and/or poet?

INTERTEXTUALITY

Poems aren't just in conversation with history. They're in conversation with other poems. This means that a literary work—in its form and/or content—resembles other literary works. When we focus on formal similarities, we're concerned with genres, the different types or subcategories a poet has chosen (e.g. epic, lyric, satire). When we focus on similar content, we are either discussing *allusions*—intended references to another literary image—or *archetypes*, images or characters that appear so frequently they are less the domain of one author than part of a common literary heritage.

Chief question: How is this literary work like/unlike other literary works?

ETHICS

Every poem interprets life and thus, explicitly or implicitly, provides us with a view of the world. Defenders of poetry have long maintained that poetry is uniquely able to delight AND instruct; in fact, it often instructs BY delighting. That means every literary work presents actions/beliefs for us to applaud or denounce. This is often the most difficult thing to interpret about a particular work of art, and we must keep in mind that a work may present objectionable actions or beliefs in order to criticize them.

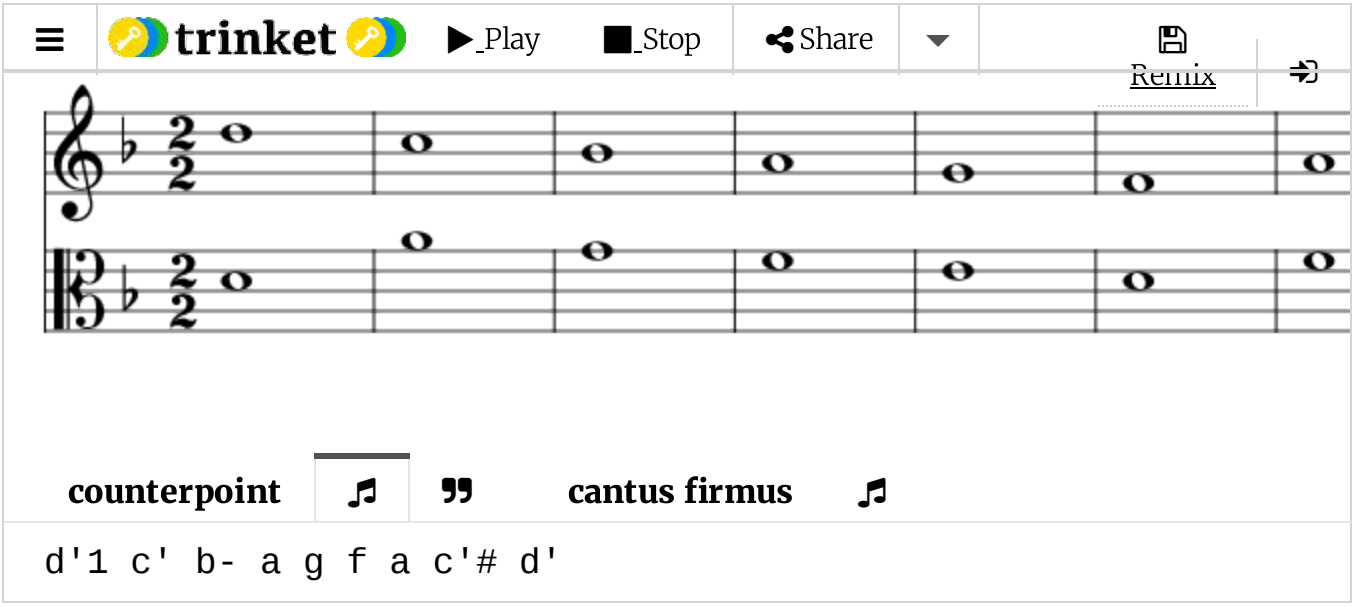
Chief question: What actions or beliefs does the poem support?

CHAPTER OVERVIEW

10: Technology

10.1: Using Trinket

10.1: Using Trinket



Error-detection exercise from Composing a first-species counterpoint.

Trinket is a new tool for interactive music notation on the web. It can be added to any website that supports iFrames, and there are several music trinkets embedded in Open Music Theory (with more on the way as the textbook grows).

Notation guide

Music notation is created by entering text into a box at the bottom of the trinket. Trinkets offer a limited set of musical features, in order to keep things simple. The text required for these features is provided below. Most of these features are included in the example trinket at the bottom of this page.

Pitch

Pitch classes are designated by their letter names followed by - for flat, # for sharp, or “n” for natural. Rests are designated by “r”.

In order to avoid confusion with rhythmic numbers, trinket uses a version of the Helmholtz register designation. So ISO Octave 4 (middle C up to the B above it) uses lower case letters:

```
c d e f g a b
```

ISO Octave 5 adds primes:

```
c' d' e' f' g' a' b'
```

ISO Octave 6 takes two primes (c’’), Octave 7 three primes (c’’’), etc.

Octave 3 (immediately below middle C) uses capital letters:

```
C D E F G A B
```

Octave 2 uses two capital letters:

```
CC DD EE FF GG AA BB
```

And so on.

Rhythm

Rhythms are designated by numbers representing note values—2 for half note, 4 for quarter note, etc.—and periods for dotted notes —2. for dotted half note, 4.. for doubly dotted quarter note, etc. These numbers immediately follow the pitches.

Ties are denoted by placing a ~ immediately after the rhythmic value.

Chords

To make a chord, simply put two or more notes within angled brackets (and put the rhythm outside the bracket).

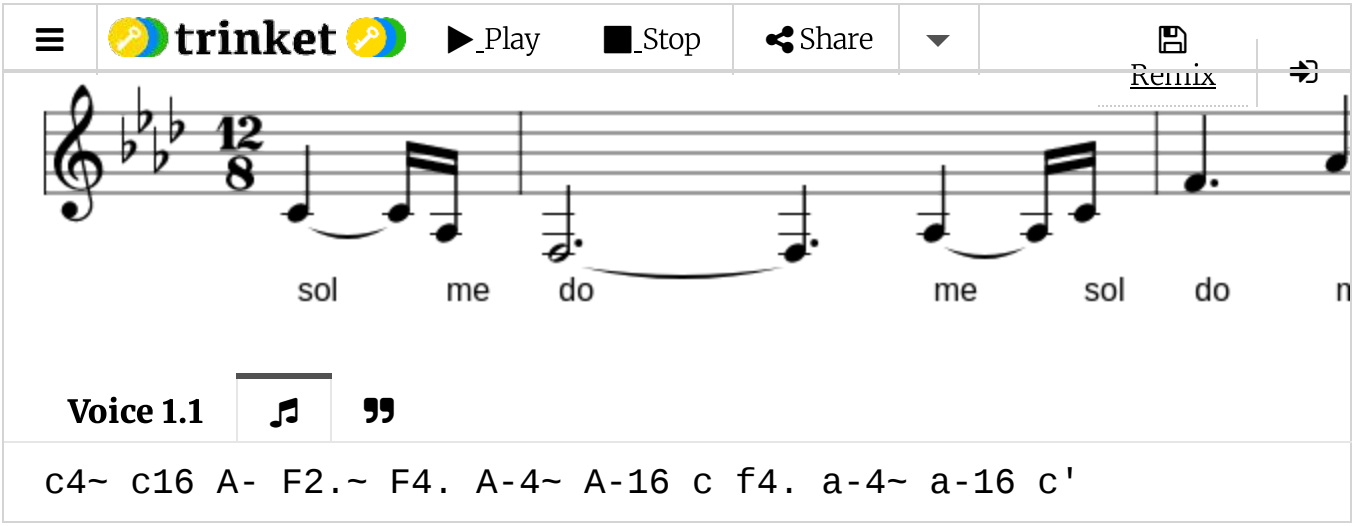
```
<c e g>4. <d f>8
```

Lyrics

When using lyrics, simple type lyrics (or analytical notation) into the lyric box. Use a space to move on to the next note. When skipping a note, put a ~ for the notes that don't take lyrics.

Example

Here is an example that uses many of the features listed above. (International readers, please forgive the movable-do!)




```
c4~ c16 A- F2.~ F4. A-4~ A-16 c f4. a-4~ a-16 c'
```

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5.5: Sonata Form - The Recapitulation

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Glossary

Sample Word 1 | Sample Definition 1

Detailed Licensing

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