

Compositional schemata

CS 275B/Mus 254

Eleanor Selfridge-Field

1. Schema theory

Passing, Contrary Motion

I vii° I

Passing, Parallel Motion

10 - 10 - 10

I V I

5 4 3 5 4 3

7 1 7 1

Monte

5 4 5 4

7 1 7 1

Fonte

Gjerdigen's applications

How do these micro-models combine with better-known elements of melodic construction?

Gjerdigen's ROMANESCA

Gjerdigen's PRINNER

Tenor clausula with preparation

The image shows a musical score for two pieces. The first piece, 'Gjerdigen's ROMANESCA', is in 4/4 time and features a melodic line with guitar fingering: 1, 5, 1, 5. The second piece, 'Gjerdigen's PRINNER', is also in 4/4 time and features a melodic line with guitar fingering: 6, 5, 4, 3, and a trill (tr). Below the second piece, a 'Tenor clausula with preparation' is shown with guitar fingering: ③, ④, ③, ②, ⑤, ①.

Allegro

der si - ni - gon Schlan - ge aus Op - fer er - ke - ren! Bam -

bat - - - si - ge Ge - he!

crem.

The image shows a musical score for a vocal piece. The top system is marked 'Allegro' and features a vocal line with lyrics: 'der si - ni - gon Schlan - ge aus Op - fer er - ke - ren! Bam -'. The piano accompaniment is in 4/4 time and features a complex rhythmic pattern. The bottom system features a vocal line with lyrics: 'bat - - - si - ge Ge - he!' and a piano accompaniment with a 'crem.' marking.

Ordered approaches to composition schemes

1. **Solfeggio** (voice pedagogy)
2. **Basso continuo harmonization** (performance)
3. **Expandable formulae** (phrase-level expansion)
4. **Partimenti** (expansion of continuo realization)

2. Solfeggio

Hexachordal era

Combinacion de las voces.

Sexto sobre agudas.	f	fa	vt	la sol
	c	la	mi ob	la mi
	b	la	sol re	la re
	a	sol	fa vt	sol fa
	g	fa	mi	sol re
Sexto agudas.	a	la	mi re	sol re
	g	sol	re vt	sol vt
	f	fa	vt 7 b	fa vt
	e	la	mi ob	mi re
	d	la	sol re	re vt
Sexto agudas.	c	sol	fa vt	sol re
	b	sol	fa vt	sol re
	a	fa	mi sna	sol re
	g	la	mi re	sol re
	f	sol	re vt	sol re
Sexto agudas.	e	1 ^o	fa vt 4 b	sol re
	d	3 ^o	la mi 3 b	sol re
	c	1 ^o	la mi 3 b	sol re
	b	1 ^o	sol re	sol re
	a	1 ^o	fa vt	sol re
Sexto agudas.	g	1 ^o	mi 2 ^a na	sol re
	f	1 ^o	re	sol re
	e	1 ^o	fa vt	sol re
	d	1 ^o	re	sol re
	c	1 ^o	fa vt	sol re

SOLFEGGIO CANTATO N° 1

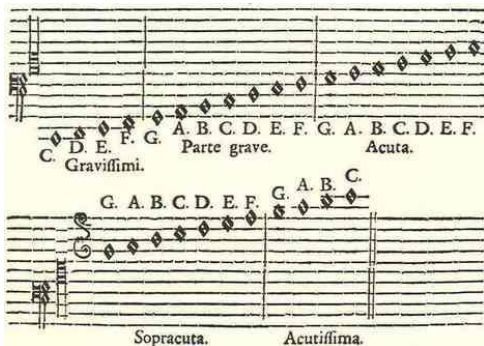
Renato Tagliabue

Diatonic era

Emphasis on degree of scale (earlier hexachord)

3. Basso continuo harmonization (18th cent.)

- Francesco Gasparini (1708)
- Johann David Heinichen
- Lots of others



Emphasis on completing harmony



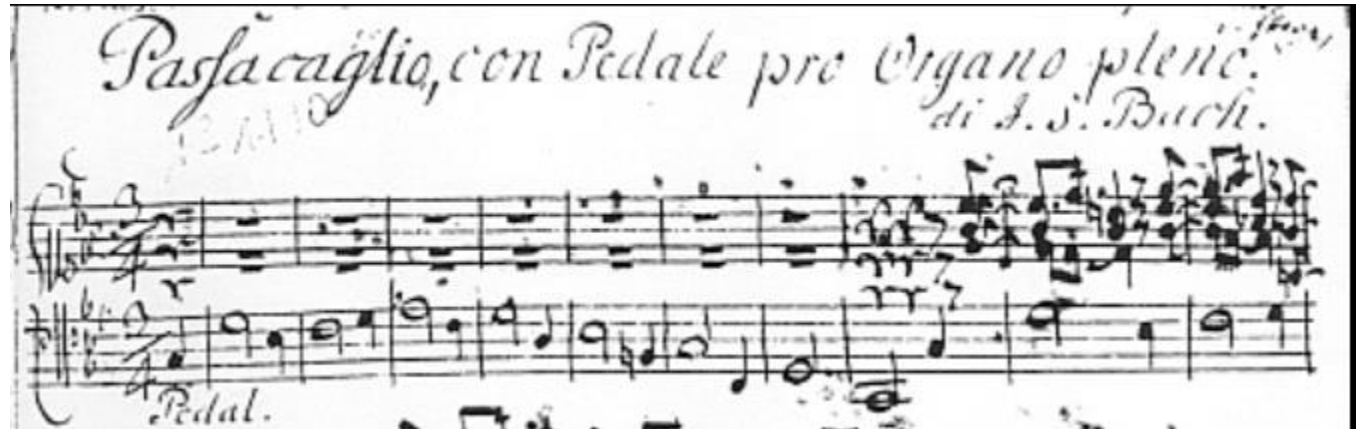
3. *Bassi ostinati* (repeated basses)

- Harmonization prescribed by tradition
- Popular on plucked, strummed instruments (16th-18th centuries)
- Frequently used for traditional dances
- Also used on stage for mad scenes
- Later used in organ music, art music



Folia with bounded melody

- Folia
- Chaconne
- Passacaglia
- Sarabande
- ...many more



Passacaglia BWV 582

Ostinato types and origins

From music for 5-string Spanish guitar (16th century onward)

First appearance: Portugal, 1577

Common “obstinate bass” patterns

- Folia
- Passacaglia
- Romanesca
- Bergamasca

The Folia ostinato [et al.]

Corelli, Op. 5, No. 12 (1700)

Adagio

5 64

Vivaldi, Op. 1, No. 12 (1705)

1. Adagio

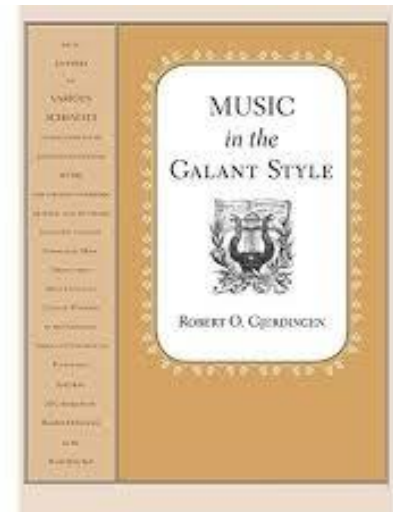
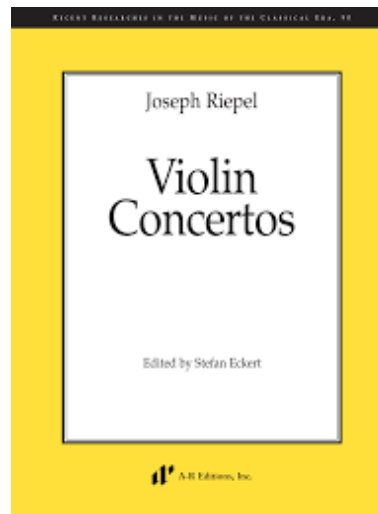
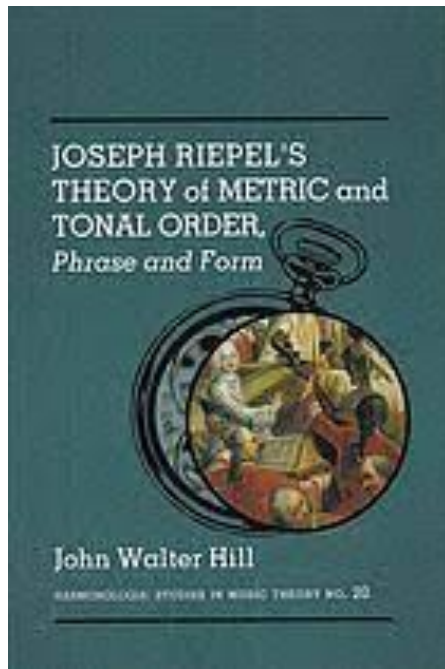
#

Gm (i)	D ⁷ (V ⁷)	Gm (i)	F (VII)	Bb (III)	F (VII)	Gm (i)	D ⁷ (V ⁷)
Gm (i)	D ⁷ (V ⁷)	Gm (i)	F (VII)	Bb (III)	F (VII)	Gm (i) D ⁷ (V ⁷)	Gm (i)

Other ostinato users

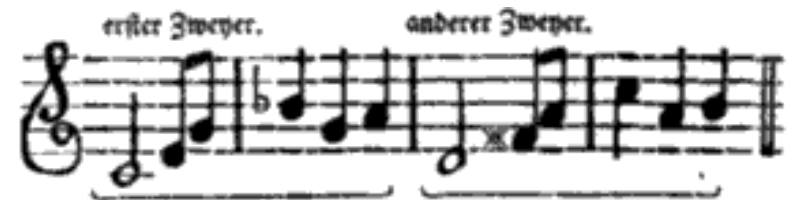
- Corelli, Scarlatti, Vivaldi, J.S. Bach, C.P.E. Bach
- Geminiani, Salieri, Cherubini,
- Beethoven, Liszt, Rachmaninoff
- Tangerine Dream, Britney Spears

4. Riepel: Melodic studies



Melodic formulae by Josef Riepel

(1752, 1775)



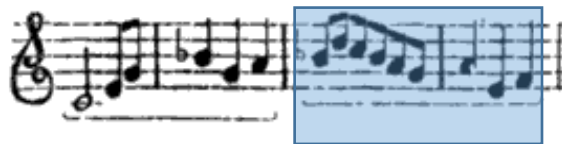
- **Melodic structure**

- Metric and tonal order synchronized
- Given minuet melody (A), these are elaborations

- 1st elaboration



- 2nd elaboration



- 3rd 4th elaborations



Emphasis on top voice

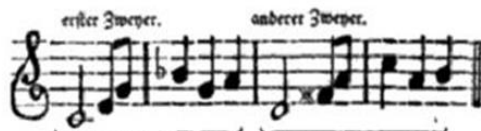
Josef Riepel (1752, 1775)

- **Melodic structure**

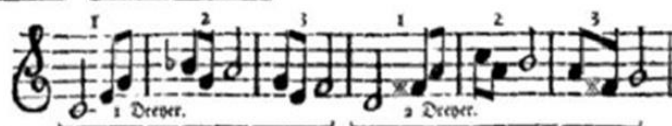
- Metric and tonal order at synchronized
- Given minuet melody (A), these are elaborations



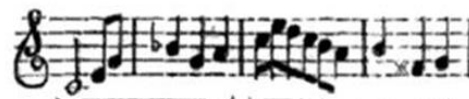
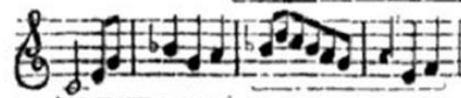
- 1st elaboration



- 2nd elaboration



- 3rd 4th elaborations



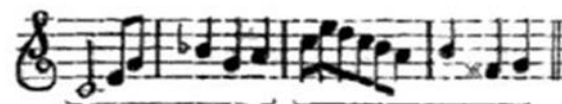
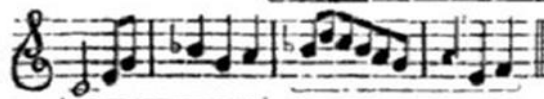
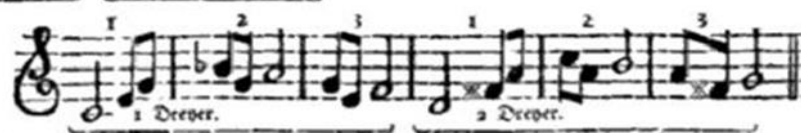
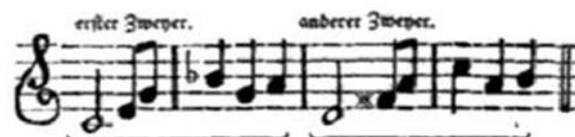
Josef Riepel (1752, 1775)

- **Melodic structure**

- Metric and tonal order at synchronized
- Given minuet melody (A), these are elaborations



- 1st elaboration
- 2nd elaboration
- 3rd 4th elaborations



5. Heinrich Christoph Koch (1749-1816)— phrase structure

- Important theorist of 18th century
 - 3-vol. **composition manual** (*Versuch einer Anleitung zu Composition...1793*)
 - Strong emphasis on **rhythm and accent**
 - Accent: (a) oratorical or (b) pathetic [**mood**]
 - *Musikalisches Lexikon*, 1803
- Very influential in recent years
 - Christopher Hasty: *Meter as Rhythm* (1997)
 - Riepel studies
 - Many Mozart and Beethoven studies

Koch: Sentence structure

musical score showing sentence structure analysis. The score is in 3/4 time and features a treble and bass clef. The first system is labeled "presentation" and contains a "basic idea" (measures 1-2) and a "basic idea repeated" (measures 3-4). The second system is labeled "continuation" and contains a "fragmentation" (measures 5-6) and a "cadential idea" (measures 7-8). Dynamics include *p*, *mf*, and *ff*. Roman numerals III^{b} and $\text{V}^{\text{4-3}}$ are indicated below the bass line.

Phrase rhythm

Sentence structure

musical score showing phrase rhythm analysis. The score is in 3/4 time and features a treble and bass clef. The tempo is marked "Allegretto". The score is divided into four numbered phrases (1, 2, 3, 4). The bass line consists of a steady eighth-note accompaniment.

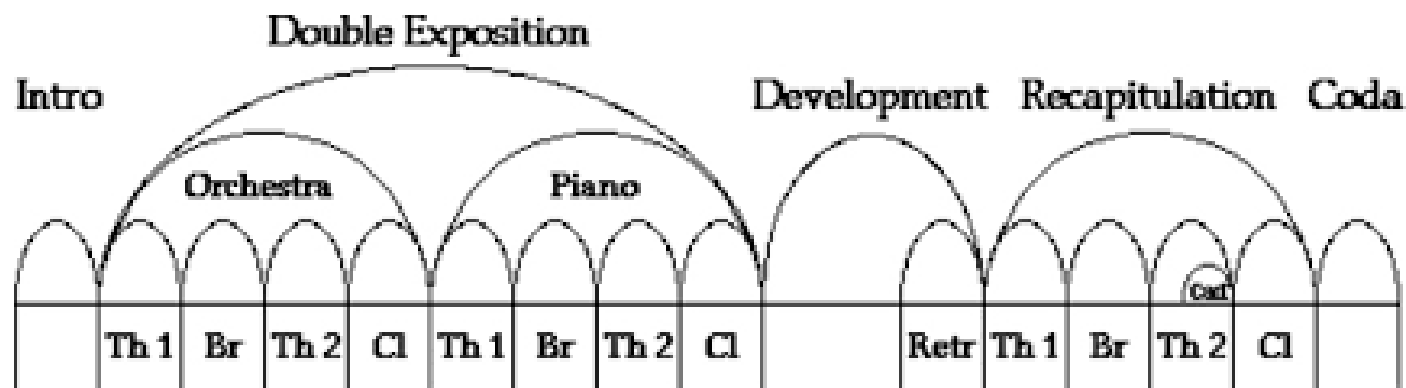
J. P. Ito: Hypermeter

- “Hypermeteral Schemas, Metrical Orientation, and Cognitive-Linguistic Paradigms,” JMT 57/1 (2013), 47-85.
- Looks at three-way reciprocity

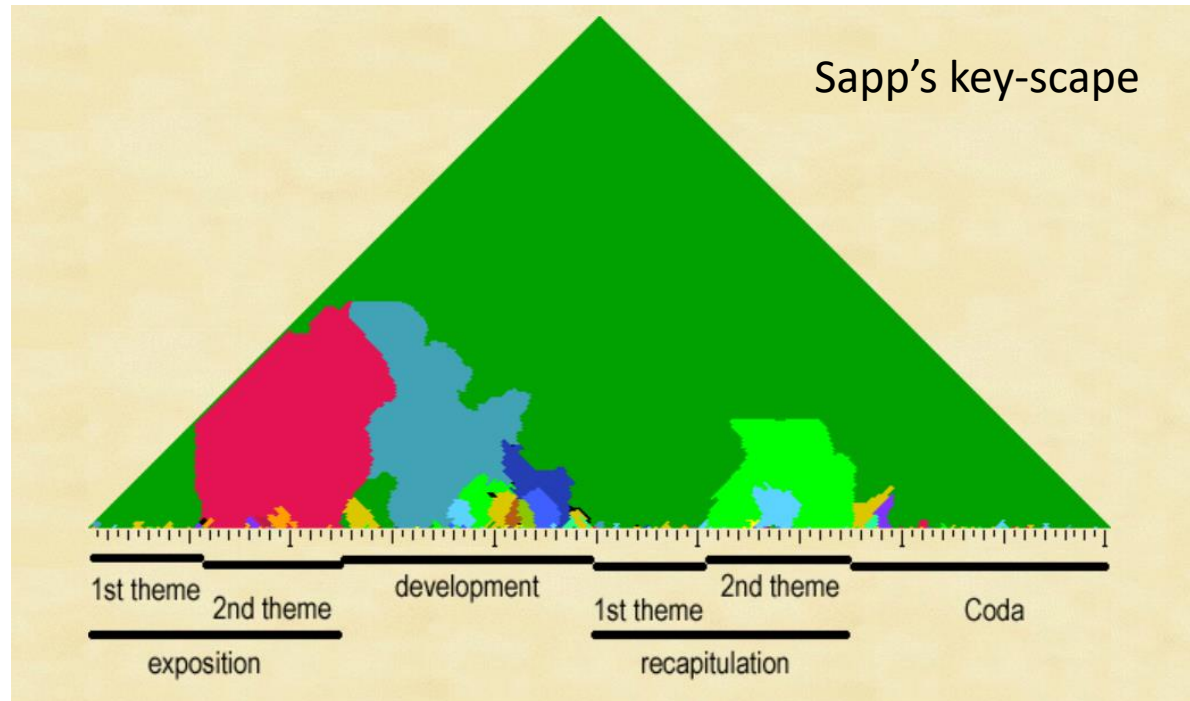
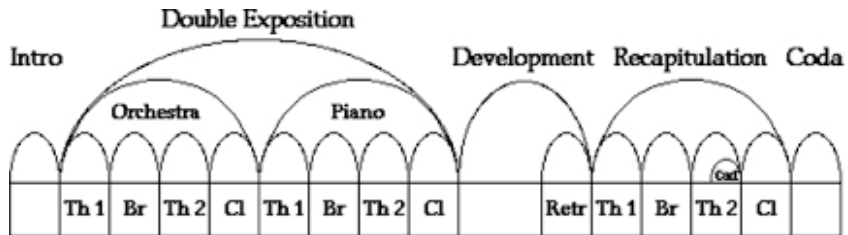
Hypermeteral units

Example 1. Beethoven Piano Sonata op. 31/3, i, mm. 1-8

Koch's sonata-allegro form (concerto)



Koch's sonata-allegro form



6. Partimenti

Recommendations to improvise new compositions

- Neapolitan in origin
- Used to enable adolescents to compose
- Most masters obscure today but methods pervasive
- *Fenaroli's rules predominate*

Codification of *partimento* theory

- Giorgio Sanguinetti (OUP book 2012)
- Robert Gjerdingen (various books and papers)
- *Partimento* website
- Many other theorists

Three classes of rules, all elastic

1. Basic axioms

Cadences: all follow I-V-I pattern but V is extensible

I-V-I

I-6/4-5/3-I

I-II-V-I s

Three classes of rules...

2. Rule of the octave

- Each scale degree is associated with one harmony
- Ascending, descending schemes of harmonization
- 6/5 chords are used on scale degrees 4 and 7.

Three class of rules....

3. Dissonances (suspensions)

- *Suspensions* are dissonances
- *Passing-tone dissonances* considered result of diminution.

Rule of the octave: *ascending scale*, 3 positions (inversions)

(a)

First position

Second position

Third position

Rule of the octave, *descending scale*

(b)

First position

8 6 3 3 #4 6 #6 8
5 3 4 8 2 3 4 5
3 3 4 5 6 8 3 3

Second position

3 3 4 5 6 8 3 3
8 6 3 3 #4 6 6 8
5 3 #6 8 2 3 5 5

Third position

5 6 #6 8 2 3 4 5
3 3 4 5 6 8 3 3
8 3 3 3 #4 6 6 8

How to elaborate the Rule of the Octave

1. Introduce smaller note denominations

(a)

Exercise (a) is a short piece in G major, 2/4 time. The right hand (treble clef) plays a sequence of dyads (two-note chords) in a stepwise fashion: G4-A4, A4-B4, B4-A4, A4-G4, G4-F#4, F#4-E4, E4-D4, D4-C#4, C#4-B3, B3-A3, A3-G3, G3-F#3, F#3-E3, E3-D3, D3-C#3, C#3-B2, B2-A2, A2-G2. The left hand (bass clef) plays single notes corresponding to the bottom note of each dyad: G2, A2, B2, C#3, D3, E3, F#3, G3, A3, B3, C#4, D4, E4, F#4, G4. The exercise is enclosed in a light blue rounded rectangle.

(b)

Exercise (b) is a short piece in G major, 2/4 time. The right hand (treble clef) plays a sequence of dyads in a stepwise fashion: G4-A4, A4-B4, B4-A4, A4-G4, G4-F#4, F#4-E4, E4-D4, D4-C#4, C#4-B3, B3-A3, A3-G3, G3-F#3, F#3-E3, E3-D3, D3-C#3, C#3-B2, B2-A2, A2-G2. The left hand (bass clef) plays eighth-note patterns: G2, A2, B2, C#3, D3, E3, F#3, G3, A3, B3, C#4, D4, E4, F#4, G4, A4, B4, A4, G4, F#4, E4, D4, C#4, B3, A3, G3, F#3, E3, D3, C#3, B2, A2, G2. The exercise is enclosed in a light blue rounded rectangle.

Methods of elaboration...

2. Vary the rhythm in the added figurations

(c)

The image shows a musical score for piano in G major, consisting of a right-hand melody and a left-hand figured bass. The right hand is in treble clef with a key signature of one sharp (F#) and a common time signature (C). The left hand is in bass clef with the same key signature and time signature. The score is divided into five measures. The first measure has a whole rest in the right hand and a half note in the left hand. The second measure has a quarter note in the right hand and a half note in the left hand. The third measure has a quarter note in the right hand and a half note in the left hand. The fourth measure has a quarter note in the right hand and a half note in the left hand. The fifth measure has a quarter note in the right hand and a half note in the left hand. The figured bass is written below the left-hand notes. The figures are: Measure 1: X 9 8 X; Measure 2: 9 8 X 9 8 X; Measure 3: 9 8; Measure 4: 7 6 5 5; Measure 5: (no figure). The notes in the right hand are: Measure 1: whole rest; Measure 2: quarter note G4; Measure 3: quarter note A4; Measure 4: quarter note B4; Measure 5: quarter note C5. The notes in the left hand are: Measure 1: half note G2; Measure 2: half note A2; Measure 3: half note B2; Measure 4: half note C3; Measure 5: half note D3.

Note similarity to species counterpoint

Methods of elaboration, cont....

3. Introduce chordal harmonization

(d)

Figure 3: Musical score (d) showing a piano accompaniment. The bass staff contains a simple harmonic line with notes and figured bass: 5/3, 6, 5/3, 6, 5/3, 6, #6. The treble staff contains chords corresponding to these figures.

(e)

Figure 4: Musical score (e) showing a piano accompaniment. The bass staff contains a simple harmonic line with notes and figured bass: 3, #4, 6, 3, #4, 6, 3, #4, 6. The treble staff contains chords corresponding to these figures.

Methods of elaboration, cont...

4. Introduce chromaticism

(a) (b)

The image displays two musical examples, (a) and (b), illustrating chromaticism in piano accompaniment. Both examples are in 3/4 time and use a key signature of two flats (B-flat and E-flat).

Example (a) shows a bass line with the following notes: G2 (fingered 5), A2 (fingered 6), B2 (fingered 7), A2 (fingered 6), G2 (fingered 7), F#2 (fingered #6), and E2 (fingered #). The notes are connected by slurs, and the final two notes (F# and E) are beamed together.

Example (b) shows a treble line with the following notes: G4, A4, B4, A4, G4, F#4, and E4. The notes are connected by slurs, and the final two notes (F# and E) are beamed together. The bass line in (b) is identical to the bass line in (a).

Elaboration...

5. interleave one descending (ascending) line in

(b)

The musical score is for a piano piece in G major, indicated by a single sharp (F#) on the treble clef. The piece is in 4/4 time. The right hand (RH) features a descending line of eighth notes: G5, F#5, E5, D5, C5, B4, A4, G4. This line is interweaved with a descending line of chords: G5 (G5), F#5 (F#5), E5 (E5), D5 (D5), C5 (C5), B4 (B4), A4 (A4), G4 (G4). The left hand (LH) features an ascending line of eighth notes: G3, A3, B3, C4, D4, E4, F#4, G4. This line is interweaved with an ascending line of chords: G3 (G3), A3 (A3), B3 (B3), C4 (C4), D4 (D4), E4 (E4), F#4 (F#4), G4 (G4). The score is divided into five measures. The first four measures show the interweaving of the lines, and the fifth measure shows the final chords for both hands.

Methods of elaboration cont....

6. Vary direction of bass (and treble) line

(b)

The musical score is written for piano in 3/4 time, featuring a treble and bass clef. The key signature has one flat (B-flat). The score is divided into four measures by vertical bar lines. The bass line starts with a quarter rest in the first measure, then moves up stepwise in the second, third, and fourth measures. The treble line starts with a quarter rest in the first measure, then moves down stepwise in the second, third, and fourth measures. A sharp sign (#) is placed above the second staff in the fourth measure, indicating a sharp sign for the next measure.

7. Species counterpoint: J. J. Fux

Johann Joseph Fux (c1660-1741)

- Authority on 16th-century Renaissance polyphony
- As codified in the 18th century
- Studies in Rome
- Head of music at the imperial court, Vienna (1715..)

***Gradus ad Parnassum* (1725)**

Gradus ad Parnassum (1725)

Steps to Mt. Parnassus

Part One: *Musica Speculativa*

i.e. tuning, acoustics, and their implications

- Mathematically exact intervals result in **half steps** that may be
 - **Larger** or
 - **Smaller**
- Equal temperament (ET) a response to awkwardness of split keys in short octaves
- ET a practical solution to a physical problem

Gradus ad Parnassum (1725)

Steps to Mt. Parnassus

Part Two: *Musica Prattica*

Purpose: “to invent a simple method by which a novice can progress, step by step”

- Counterpoint
- Fugue
- Double fugue

“Theory without practice is useless”

Steps (*species*) of the path (Gradus)

- *First*: (whole) note against note
- *Second*: (whole) note against half-note(s)
- *Third*: (whole) note against quarter-note(s)
- *Fourth*: Introduces suspensions, of turning figures (*cambiate*)
- *Fifth* (florid): **Use of mixed rhythmic values**

The *Gradus* is only book from Bach's theory library to survive.

Species: Second, Third, Fifth

Second

Cantus firmus

Third

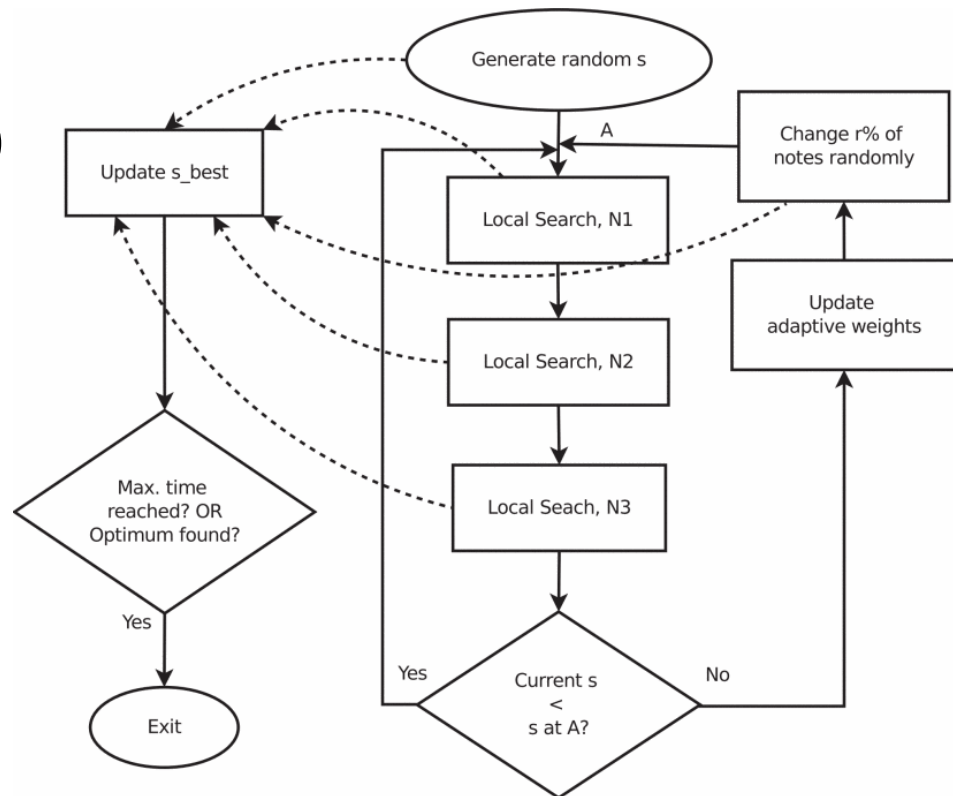
Cantus firmus

Fifth

Cantus firmus

Herremans and Soerensen: *Fux*, an Android app the generates fifth-species counterpoint

- Relies on Variable Neighborhood Search (VNS)
- VNS=local search strategy
- Here: three neighborhoods



Herremans, Soerensen: Musical details

Edit-distance inspired accommodations in *cantus firmus*

- Original;
- Swap;
- Change;
- Change 2

Fig. 2.
► Show in Context



(a) Original



(b) Swap move



(c) Change1 move



(d) Change2 move

Herremans, Soerensen: Musical details

Edit-distance inspired accommodations in cantus firmus

- Original; Swap; Change; Change 2

[several violations of cp rules: tritones, hidden fifths....]



The first system of musical notation shows a cantus firmus in 4/4 time. The treble clef staff contains a melodic line with various intervals, including tritones and hidden fifths. The bass clef staff contains a simple harmonic accompaniment of whole notes.



The second system of musical notation shows a cantus firmus in 4/4 time, starting at measure 12. The treble clef staff contains a melodic line with various intervals, including tritones and hidden fifths. The bass clef staff contains a simple harmonic accompaniment of whole notes.