Melodic Similarity

CS 275B/Music 254

"Natural history" of similarity

- ***Concept of similarity*** fundamental to organization of most art music
- ***Types of similarity*** widely variant
- ***Roles of similarity*** widely variant
- Similarity in art music is **intentional**

Contour matches (accidental)

- Target:
  - Chant: "Lucis Creator"

- Some hits:

  - Bach *WTC*

  - Bizet: *Carmen*

  - Saint-Saens: *Carnival* (via Offenbach)

  - Mozart: Symphony No. 41, IV

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Melodic "Invisibility" Factors

▸ Elaboration of something simple

▸ Compound melodies (monophonic)

▸ Psycho-acoustic tricks (polyphonic)

▸ Rotating melodies

▸ Ambiguous foreground/background

▸ Metrical ambiguity

Elaboration

Bach, Art of Fugue (after Wiering et al.)

Contrapunctus I, alto.

Canon per Augmentationem in Contrario Motu. soprano. EMD 5.55284: PTD 5.90789

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Classic features of melody: symbols vs humans

- Eerola et al, MP (2001): Statistical vs perceptual melodic similarity
    - Material used: Finnish folk songs
- Frequency distributions (symbols)
    - Tones
    - Intervals
    - Durations
    - Two-tone transitions

- Frequency distributions (listeners)
    - Tessitura
    - Mean pitch
    - Rhythmic activity
    - Rhythmic variability
    - Melodic predictability

Recency, Latency (Music/Linguistics)

- Mario Baroni, Carlo Jacoboni, et al.
  - (1984 et al.)
- Melodic kernel
  - Tessitura
  - Start and end points, by phrase
- Repertories
  - Legrenzi cantatas

Tessitura; Kernel

Folksong research methods

▸ Main technique: scan phrase endings, the compile "footprint" of overall scheme

▸ Essen analysis tools (c. 1991)

"Der Mai tritt ein mit Freuden"

6: *REG* [Europa, Mitteleuropa, Deutschland, Niederrhein]
7: *KEY* [Z1262 08 A 3/4] ZZ [8]
8: *MEL* [-5_ 1_.231 -5_.-3 -4-5 -6_.-71-6
    -5_-4_-3_ -4_-6_-5-4 -3-51_ 3_ 321_-7_
    1__12 3_1_5_ 2_1_-7_ 1_-6_2_ -7_-5_-5_
    -6_.-71-6 -5_1_3_ 321_-7_ 1__ //]

Der Mai tritt ein mit Freu-den, es__ flicht der Win-ter

Kalt ... ie Blüm-lein auf der Hei-den, die blü-hen man-nig-

... Ein   Rö-se-lein zar-te, von Far-be so schö ... das

blüht in mei-nem Gar-ten, vor al-len ich's krön'.

9: *MOD* [HEPTATONIC IONIAN]
10: *ACC* [1-5_-6-5_-4-3_31_32_1-7_-6-5_31_]
11: *FOR* [...

13: *FCT* [Natur und Welt]

Algorithmic vs Human Judgment

Works by Passion Fruit

- Repertory: popular

- Data: MIDI

- Processes include:

    - contour generalization

    - aliasing

    - fuzzification

Features:
- intervals
- contour
- rhythm
- harmony
- recurrent motifs

Class	Intervals	Name
-4	< -7	Big leap down
-3	-7, -6, -5	Leap down
-2	-4, -3	Big step down
-1	-2, -1	Step down
0	0	Same
1	1, 2	Step up
2	3, 4	Big step up
2	5, 6, 7	Leap up
4	> 7	Big leap up

Perceptual tricks

‣ Compound melody
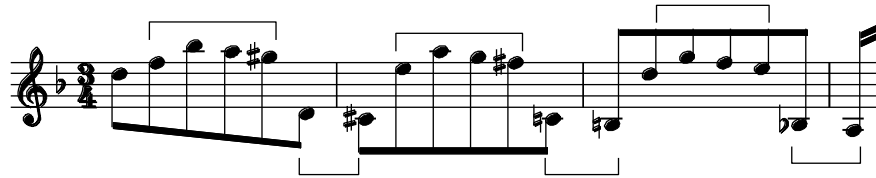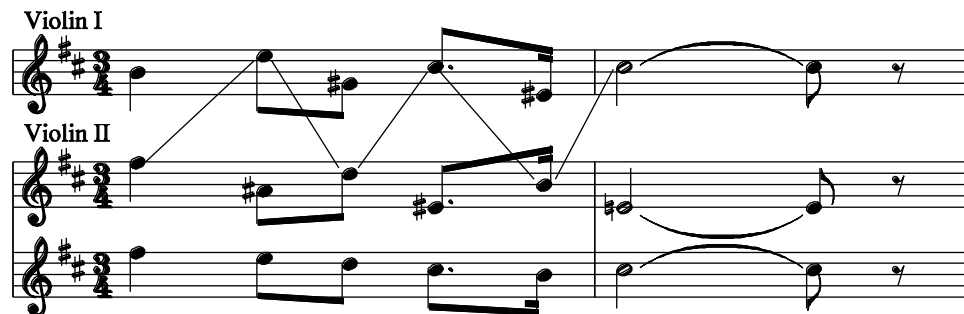
One voice that
we hear as two

‣ Distributed melody

Two voices that
we hear as one

Rotating melodies

B, T, B, T; A, S

Haydn: "Archduke" String Quartet

Perceptual tricks:
Ambiguous foreground/background

Schubert

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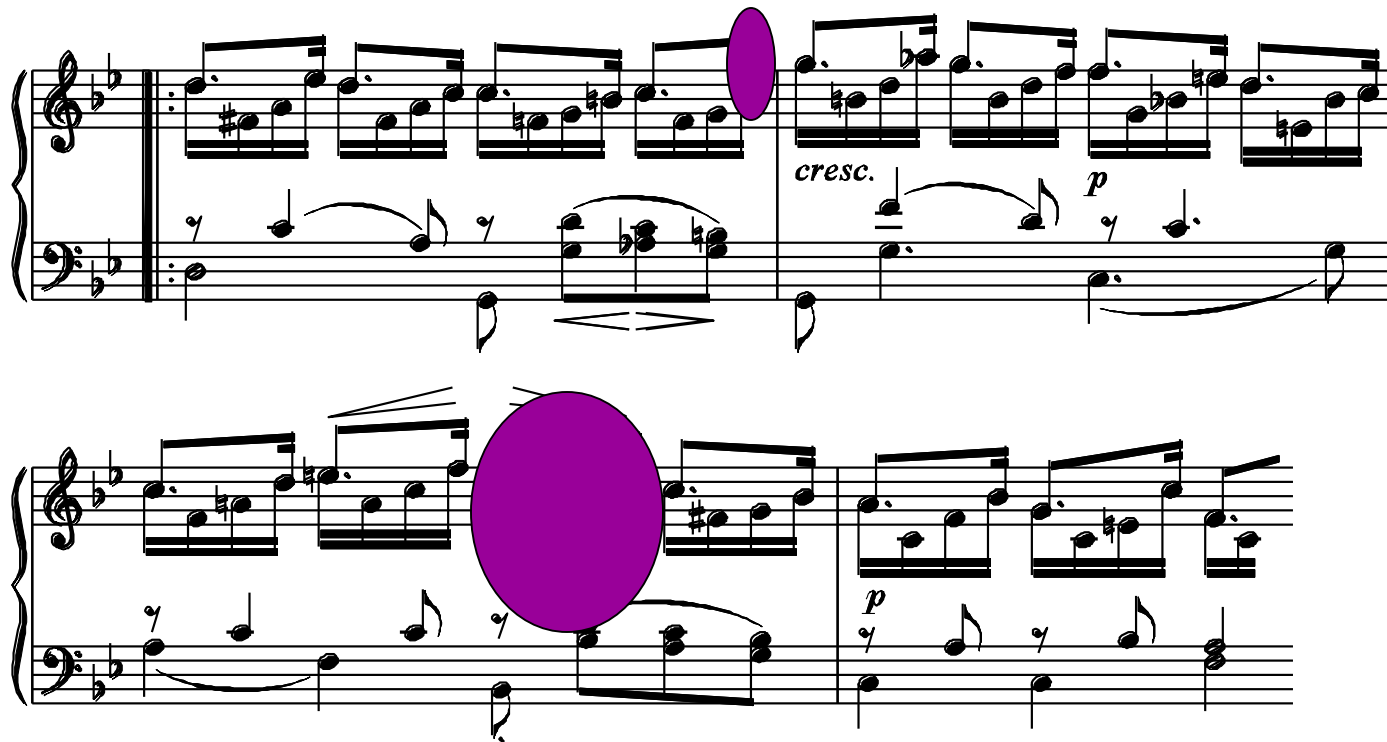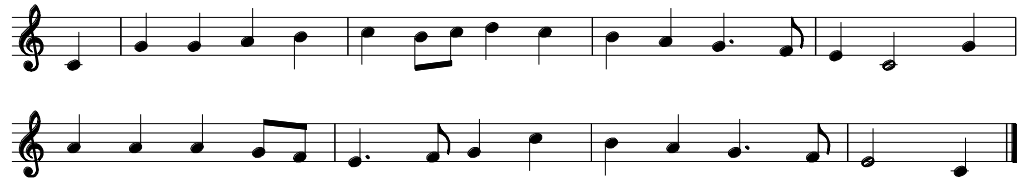
Perceptual tricks: Metrical ambiguity

Ratner

Brahms

Col intimissimo sentimento ma senza troppo marcare la Melodia

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Tune-family studies (social cognition)

▸ Morris tune
  - ▸ Weelkes (1608)

  - ▸ Jones (1802)
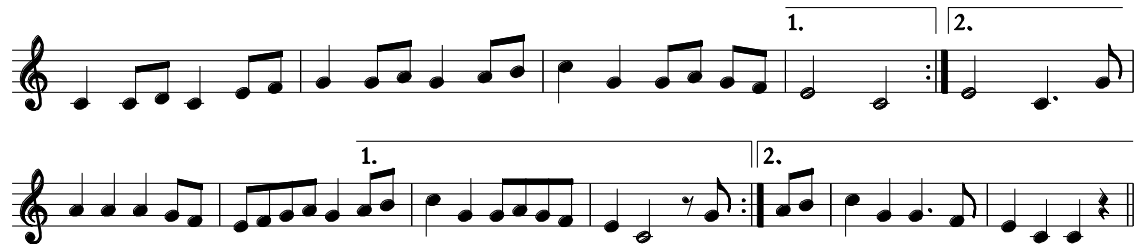
▸ Londonderry air
  - ▸ Verse part: 1704

  - ▸ Chorus part: 1850
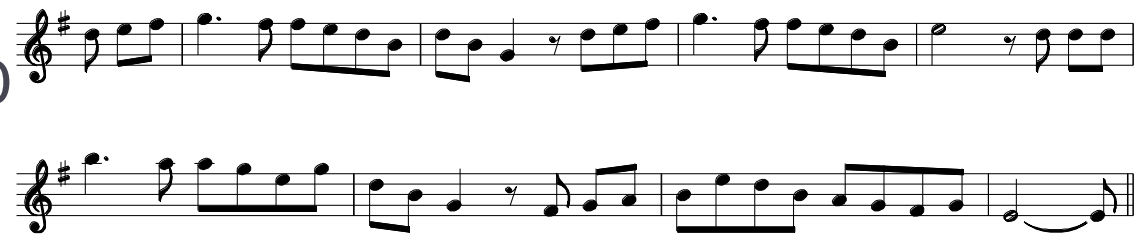
A similarity study: Ballo di Mantova

Fug- gi fug- gi fug – gi da que – sto cie – lo, aspr' e du – ro, spie- ta – to ge – lo

Prima Parte
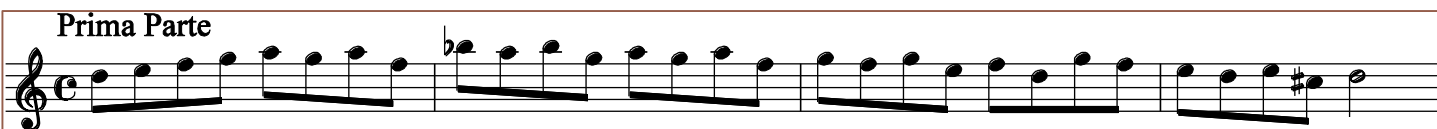
Ballo di Mantova

De ge - bo - den da — gen Viert, o Ca - tho - lijk: Dat ghy Godt mooght be -

- ha - gen, En win - nen — 't he - mel - rijck.

Same melody, other social contexts

▸ Dance of Mantua as Dvorak's "Moldau" theme
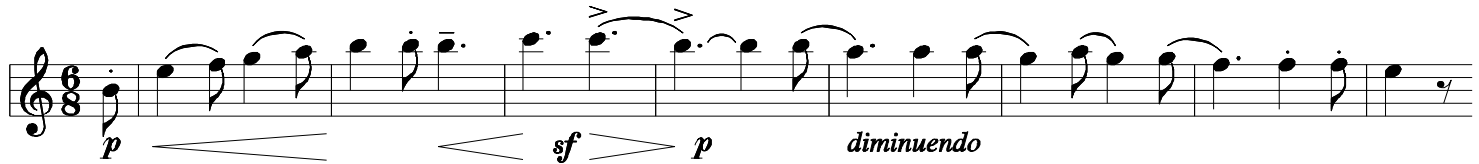
▸ As "Hatikva" (Israeli national anthem)

What makes "same" melodies recognizable?

- Meter (except compound adaptations)
  - Especially rhythmic patterns associated with particular dance steps
    - Residues of motor memory?
- Mode usually (not always) preserved)
  - Are major > minor equivalent to minor > major?
- Social convention
  - Properties external to music itself

Websites for literature on similarity

- www.ismir.net   Proceedings for individuals years can be downloaded

- Psychinfo [lib.stanford.edu databases]

- RILM [lib.stanford.edu databases]

- OR searchworks.stanford.edu