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MTO 28.3 Examples: McAdams, Goodchild, and Soden, A Taxonomy of Orchestral Grouping Effects Derived from Principles of Auditory Perception

(Note: audio, video, and other interactive examples are only available online)

<https://mtosmt.org/issues/mto.22.28.3/mto.22.28.3.mcadams.html>

Example 1. Auditory grouping gives rise to events from which perceptual properties are extracted, which then acquire musical functions within a given sonic context

Auditory grouping mechanisms

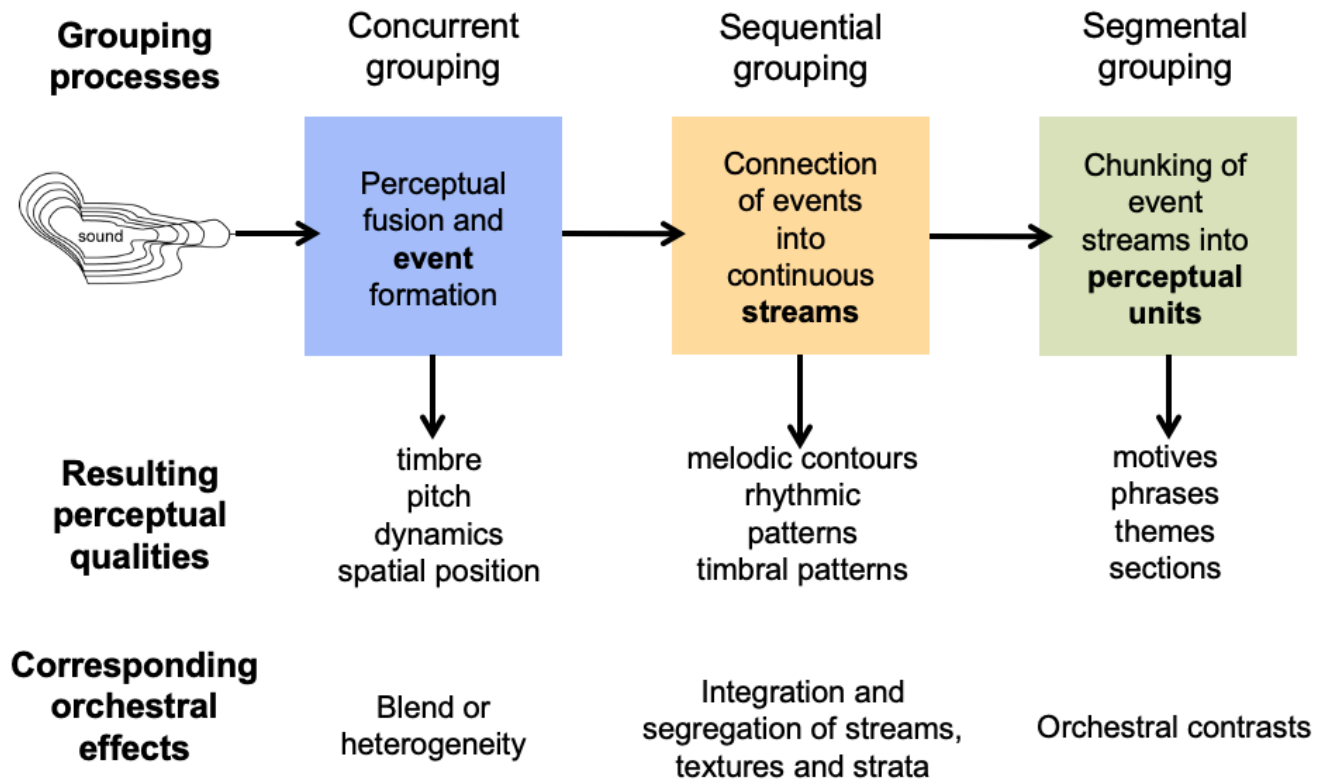


Perceptual properties

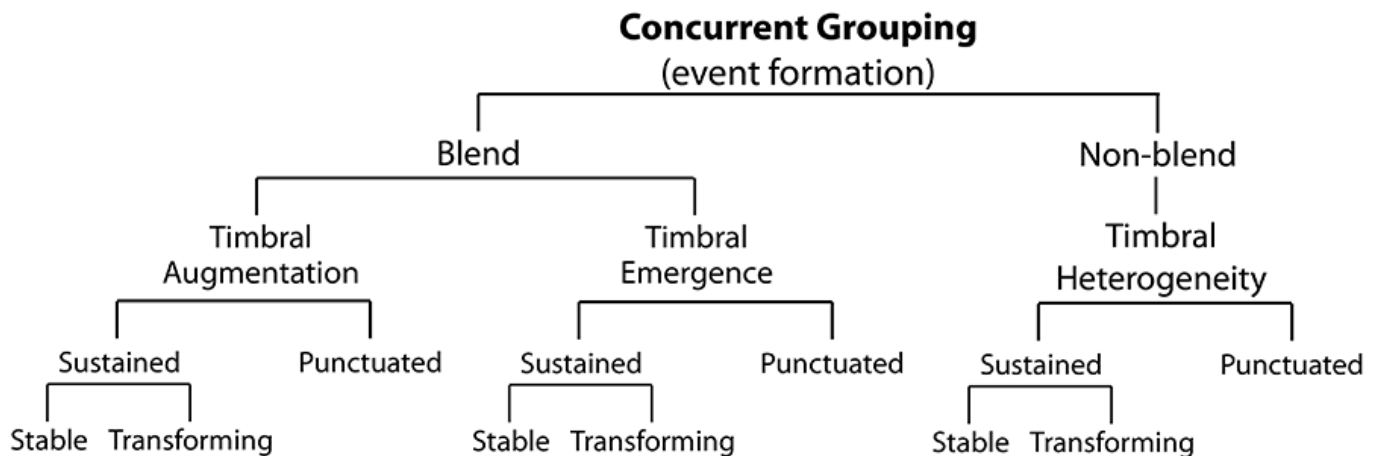


Musical function of perceptual properties

Example 2. Auditory grouping processes and the resulting perceptual qualities and corresponding orchestral effects. [Adapted from Goodchild and McAdams 2021, Fig. 1]



Example 3. Taxonomy of concurrent auditory grouping phenomena



[illegible]

Dominating

Embellishing

Example 5. Timbral augmentation (sustained, transforming): Wagner, *Parsifal*, Overture, mm. 20–25

Example 6. Timbral augmentation (punctuated):
Sibelius, Symphony no. 5, op. 82, iii, mm. 474–482

Un pochettino stretto

Score in C

The score is written for a full orchestra. The key signature is one sharp (F#), and the time signature is 4/4. The tempo marking is "Un pochettino stretto". The score is in C major. The instruments and their parts are as follows:

- Fl. 1 2:** Flute 1 and 2, playing sustained notes with *ffz* markings.
- Ob. 1 2:** Oboe 1 and 2, playing sustained notes with *ffz* markings.
- Cl. in B♭ 1 2:** Clarinet in B♭ 1 and 2, playing sustained notes with *ffz* markings.
- Bsn 1 2:** Bassoon 1 and 2, playing sustained notes with *ffz* markings.
- Hn in F 1 2:** Horn in F 1 and 2, playing sustained notes with *ffz* markings.
- Hn in F 3 4:** Horn in F 3 and 4, playing sustained notes with *ffz* markings.
- Tpt in B♭ 1 2:** Trumpet in B♭ 1 and 2, playing sustained notes with *ffz* markings.
- Tpt in B♭ 3:** Trumpet in B♭ 3, playing sustained notes with *ffz* markings.
- Tbn 1 2:** Trombone 1 and 2, playing sustained notes with *ffz* markings.
- Tbn 3:** Trombone 3, playing sustained notes with *ffz* markings.
- Timp.:** Timpani, playing sustained notes with *ffz* markings.
- Vln I:** Violin I, playing sustained notes with *ffz* markings.
- Vln II:** Violin II, playing sustained notes with *ffz* markings.
- Vla:** Viola, playing sustained notes with *ffz* markings.
- Vc.:** Violoncello, playing sustained notes with *ffz* markings.
- Cb. I:** Contrabass I, playing sustained notes with *ffz* markings.

Example 7. Timbral emergence (sustained, stable): Debussy, *La Mer*, i, mm. 6–17

Example 8. Timbral emergence (sustained, transforming):
Schoenberg, *Five Pieces for Orchestra* op. 16, iii, mm. 1–11

Score in C

Multige Viertel

Pfue 1,2
ppp

Englisch Horn 2
ppp

Clarinet 1,2 in Bb
ppp

Bass Clarinet
ppp

Flauto 1,2
ppp

Flauto 3
ppp

Horn in F 2
mit Dämpfer
con sord.
ppp

Trumpet in Bb 2
mit Dämpfer
con sord.
ppp

Trumpet 3
ppp

Viola solo
Solo ohne dämpfer
senza sord.
ppp

Violoncello
1
ppp

Violoncello
2
con sord.
ppp

Contrabasso
1
Solo ohne dämpfer
ppp

Contrabasso
2
con sord.
ppp

Contrabasso
3
Solo Kb.
mit Dämpfer
ppp

4 Solo-Vcelli mit Dämpfer
alle 4 auf die C-Saite
ppp

Blend

Example 9. Timbral emergence (punctuated): Berlioz, *Symphonie fantastique*, iv, m. 17

Score in C

$\text{♩} = 72$

Cl. 1,2 in C

Bsn 1,2

Hn 1,2 in B \flat

Hn 3,4 in E \flat

Tpt. 1,2 in B \flat

Cnt. in B \flat

A. Tbn

Tbn 2,3

Timp. 1

Timp. 2

$\text{♩} = 72$
arco

Vln. 1

Vln. 2

Vla

Vc.

Cb.

Example 10. Timbral heterogeneity (sustained, stable): Debussy, *La Mer*, iii, mm. 183–186.

Note that the glockenspiel sounds two octaves higher than written.

The rest of the orchestra is not shown.

Score in C

183 *Animé et tumultueux* (♩ = 96)

Eh. *pp*

Hn in F 1 *pp*

Glock. *pp* *doux et expressif*

Blend

Non-blend

Score in C

Picc. 1

Fl. 1.2

Ob. 1.2

Cl. 1.2

Bsn. 1.2

Hn 1.2

Tri.

Vln. 1

Vln. 2

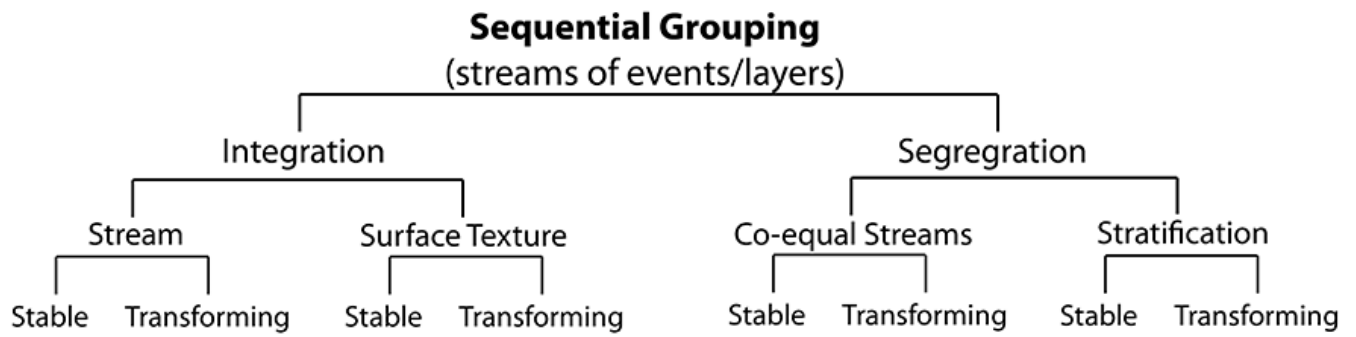
Vla

Blend

Non-blend

Blend

Example 12. Taxonomy of sequential auditory grouping phenomena



Example 13. Stream integration (stable). Ravel's orchestration of Mussorgsky's *Pictures at an Exhibition*, vi ("Samuel Goldberg and Schmuyl"), mm. 1–8, Score in C

Andante

English Horn

Clarinet in A 1

Clarinet in A 2

Bass Clarinet in A

Bassoon 1

Bassoon 2

Violin I

Violin II

Viola

Violoncello

Contrabass

Instrumental parts and musical notation for measures 1–8, marked Andante.

Example 15. Surface texture (stable): Smetana, Die Moldau, mm. 185–194

Score in C

l'istesso tempo
p *lusingando*
pp *ondeggiante*

Fl. 1, 2
Cl. 1, 2 in Bb

Surface texture

Score in C

[illegible]

Example 17. Stream segregation (stable) of co-equal single-instrument lines: Vaughan Williams, *The Lark Ascending*, mm. 88–94

Score in C

Allegretto Tranquillo
(quasi Andante)

Ob. 88 solo *p* **J** Tranquillo Stream 2

Solo Vln. *(p)* 6 *tr* 6 **J** Tranquillo Stream 1

Vln. 1 *pp* *mf*

Vln. 2 pizz. arco *pp* *mf*

Vla pizz. arco *pp*

Vc. pizz. arco *pp*

The image shows a musical score for Vaughan Williams' *The Lark Ascending*, measures 88-94. The score is for a woodwind and string ensemble. The Oboe (Ob.) and Solo Violin (Solo Vln.) parts are highlighted with green dashed boxes and labeled 'Stream 2' and 'Stream 1' respectively. The Oboe part is marked 'solo' and 'p' (piano). The Solo Violin part is marked '(p)' (piano) and 'tr' (trill). The Violin 1 (Vln. 1) and Violin 2 (Vln. 2) parts are marked 'pp' (pianissimo) and 'mf' (mezzo-forte). The Viola (Vla) and Violoncello (Vc.) parts are marked 'pizz.' (pizzicato) and 'arco' (arco). The tempo is 'Allegretto Tranquillo' and the mood is '(quasi Andante)'. The key signature is C major and the time signature is 2/4. The score is in C major.

Example 18. Stream segregation (stable) of blended streams: Borodin, *In the Steppes of Central Asia*, mm. 210–218

Score in C

F Allegretto con moto $\text{♩} = 92$

210

Fl. 1,2 *mf*

Ob. 1 *mf*

Eh. *mf*

Cl. 1,2 in A *mf*

Ben 1,2 *mf*

Hn. 1,3 in F *mf*

Hn. 2,4 in F *mf*

Tpt. 1,2 in F *p*

Timp. 1 *p*

Vln. 1 *mf*

Vln. 2 *mf*

Vla. *pizz.* *mf*

Vc. *pizz.* *mf*

Cb. *mf*

Stream 2

Stream 1

Example 19. Stream segregation (transforming) of blended streams: Stravinsky, *Quatre Etudes, iv* (*Madrid*), mm. 93–94

Score in C

Stream 1

Stream 2

Violins I & II, Viola, Violoncello, and Double Bass

Example 20. Stratification (stable) with three layers: Mahler, Symphony no. 1, ii, mm. 26–31

Score in C

26 $\text{♩} = 66$

Fl. 1.2 *f* *a 2* *a 2* *a 2* *a 2*

Ob. 1.2 *f* *a 2* *a 2* *a 2* *a 2*

Cl. in A 1.2 *f* *a 2* *a 2* *a 2* *a 2*

MG

Vln. 1 *f*

Vln. 2 *f*

Vla *f*

FG

Vc. *p*

Cb. *p*

BG

Example 21. Stratification (transforming) in three layers:
 Borodin, *In the Steppes of Central Asia*, mm. 27–42]

Score in C

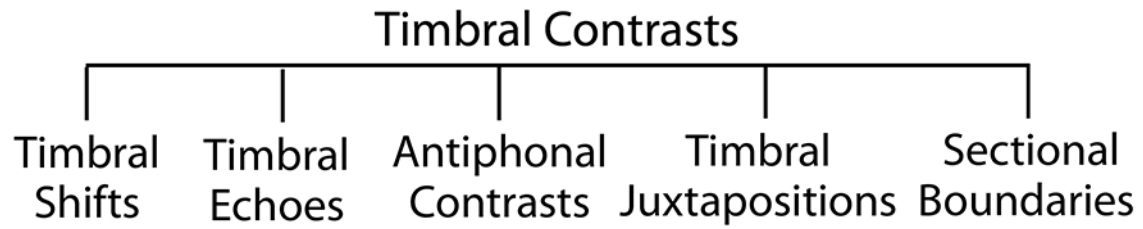
Fl 1 & 2
 Ob.
 Cl. 1, 2 in A
 Hn. 1, 2 in F
 Hn. 3, 4 in F
 Trb. 1, 2
 Vln. 1
 Vln. 2
 Vla.
 Vcl.
 Cb.

ppp
 pp
 p
 mf

FG
 BG
 MG

Example 22. Taxonomy of sequential auditory grouping phenomena

Segmental Grouping (units)



Example 23. Timbral shifts: Schubert, Symphony no. 9 in C major, i, mm. 594–602]

Score in C

Flute 1, 2 *p* *molto*

Oboe 1, 2 *p*

Clarinet 1, 2 in C *p*

Bassoon 1, 2 *p*

Horn 1, 2 in C *p*

Trombone 2 *p*

Bass Trombone *p*

Violin 1 *p*

Violin 2 *p*

Viola *p*

Violoncello *p*

Contrabass *p*

Measures 594-602 are highlighted with blue boxes and arrows, indicating a timbral shift.

Example 24. Timbral echo: Sibelius, Symphony no. 2 in D major, ii, mm. 120–128

Score in C

88 *Andante con moto ed energico* I. Solo

Flute 1

Trumpet in F 1

mp *mf*

Example 25. Antiphonal contrast: Haydn, Symphony no. 100 in G major (Military), ii, mm. 61–64

Score in C

61 *Allegretto* solo

Fl. 1

Ob. 1

Ob. 2

Cl. in C 1

Cl. in C 2

Bsn. 1

Bsn. 2

Vln. 1

Vln. 2

Vla

Vc.

Cb.

p

Example 26. Timbral juxtapositions: Sibelius, Symphony no. 2, ii, mm. 67–75

Example 27. Sectional boundaries: Dolan's (2013b) orchestral graph of Haydn, Symphony no. 100, ii. Colors represent different instruments and the line thickness corresponds to notated dynamics. The instruments are arranged with strings at the bottom followed by woodwinds, brass, and percussion. The horizontal bracket over the second panel indicates the measures included in **Audio example 22** (mm. 49–70) (from Dolan 2013b, used with permission)
[simulation from OrchPlayMusic Library]

