



A JOURNAL OF THE SOCIETY FOR MUSIC THEORY

MTO 27.1 Examples: Beavers, Ravel's Sound: Timbre and Orchestration in His Late Works

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

<https://mtosmt.org/issues/mto.21.27.1/mto.21.27.1.beavers.html>

Example 1. Ravel's Late Orchestral Compositions

Date	Composition	Type	Timbre technique
1922	<i>Pictures at an Exhibition</i>	Mussorgsky piano piece (1874) arranged for orchestra	Color instruments evoke imaginary place
1928	<i>Boléro</i>	Original composition	Illusory saxophones, trumpet, and organ within continuous development
1929	<i>Menuet antique</i>	Original piano piece (1895) arranged for orchestra	Color instruments evoke imaginary time; Illusory shawm and organ
1930	Concerto for the Left Hand	Original composition	Illusory harps and color instruments evoke dream within dialogic development
1931	Concerto in G Major	Original composition	Piano's transformations create transcendence within the recapitulation

Example 2. The SPC Model (Johnson 2011)

Classification	Instruments		
Color	<i>Piccolo+</i>	<i>Horn+</i>	<i>Celesa</i>
	<i>Oboe d'amore</i>	<i>Cornet</i>	<i>Percussion</i>
	<i>Eb clarinet</i>	<i>Piccolo trumpet</i>	<i>Harp</i>
	Bass clarinet		<i>Piano</i>
	English horn		
	Contrabassoon		
	<i>Saxophones</i>		
Power	Piccolo	Horn	Timpani
		Trumpet	<i>Snare drum*</i>
		Trombone	
		Tuba	
Standard	Flute	Violin	
	Oboe	Viola	
	Clarinet	Cello	
	Bassoon	Bass	

*Instruments in italics are my additions.

+The piccolo and horn appear in both power and color instruments because they serve a dual function dependent on the orchestral gesture, range, and dynamics.

~The horn can follow the core woodwinds, brass choir, or function as a solo/soli instrument

Example 3. "Promenade," Power Instruments

Power instruments

Piano

Horn in F I. II

Horn in F III. IV

Trumpet in C

Tuba

f

f

f

f

Example 4. "Promenade," Transcription with Antiphonal Response

Mussorgsky, "Promenade," Piano Score (no dynamics or articulations)

Standard instrument

Color instrument in same auditory stream as standard instruments

Ravel, "Promenade," Orchestration (with added dynamics and articulations)

Example 5. Beginning of “Gnomus” with Magical Effect

Event 1 Event 2

Event 1

Vivo

2 Clarinets

Bass Clarinet

2 Bassoons

Contrabassoon

Horn in F

Viola

Cello

Bass

Event 2

meno Vivo

p

S > P

S > C

Magical effect

→

Timbral transformation

Example 6. Orchestration of Two Streams in “Gnomus”

Example 7. More Color Effects and Instruments in “Gnomus”

9

Piano

Bass Clarinet

Horn in F

Celesta

Harp

Violin I

Violin II

Viola

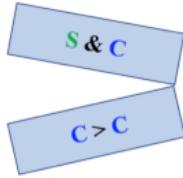
Cello

Bass

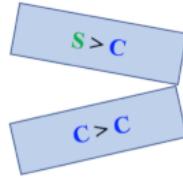
Stream 2: C instruments (celesta, harp) and effects (harp harmonics, violin pizz.)

Stream 1: C instrument (bass clarinet) and effects (magic effect circled in score and arco sulla tastiera)

First phrase
Reh. 8
(mm. 19–27)



Second phrase
Reh. 9
(mm. 29–37)



Example 8a. Menuet antique, Piano

Piano

m. 1

m. 10

Similar register

motive α

Example 8b. Menuet antique, Piano Events

Piano

Event 1

m. 10

Stream 2

Stream 1

Event 2

m. 10

Event 3

m. 10

α

α

α

α

Antecedent

α

α

α

α

Consequent

α

α

α

α

Prolongation

α

α

α

α

Illusory celesta/harp

SP \rightarrow **C**

Example 8c. Menuet antique, Orchestra Events

Piano

Event 1

m. 10

Stream 2

Stream 1

Event 2

m. 10

Event 3

m. 10

Event 4

m. 10

Introduction

α

α

α

α

“Renaissance”

Shawm

Antecedent

α

α

α

α

“Baroque”

Imitative

Consequent

α

α

α

α

“Classical”

Bel canto

Prolongation

α

α

α

α

“Ancient”

Illusory Harp

Example 9a. *Menuet antique*, End of A to Pastoral Section, Piano

Piano

en élargissant

m. 47

The musical score for piano is shown in two staves. The top staff is in treble clef and the bottom staff is in bass clef. Both staves are in 3/4 time with a key signature of two sharps. Measure 46 begins with a dynamic of ***ff*** (fortissimo). The piano part consists of sustained chords and bass notes. Measure 47 begins with a dynamic of ***z*** (zum) and a grace note. A green box highlights a melodic line starting with a grace note and a eighth note. The score concludes with a dashed line indicating the continuation of the piece.

Example 9b. Menuet antique, End of A to Pastoral Section, Orchestra

m. 47

Flute Piccolo

Oboe

Clarinet in A

Bassoon

Contrabassoon

Horn in F

Trumpet

Trombone

Trombone Tuba

Timpani

Harp

Violin I

Violin II

Viola

Cello

Bass

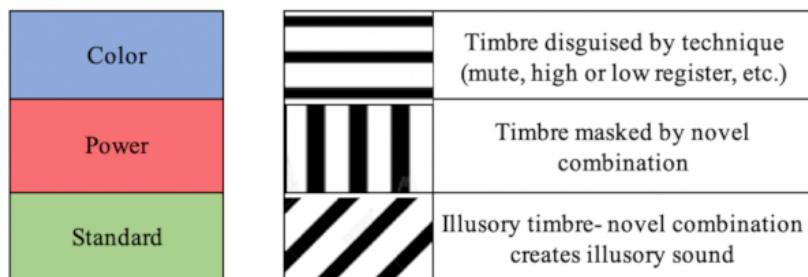
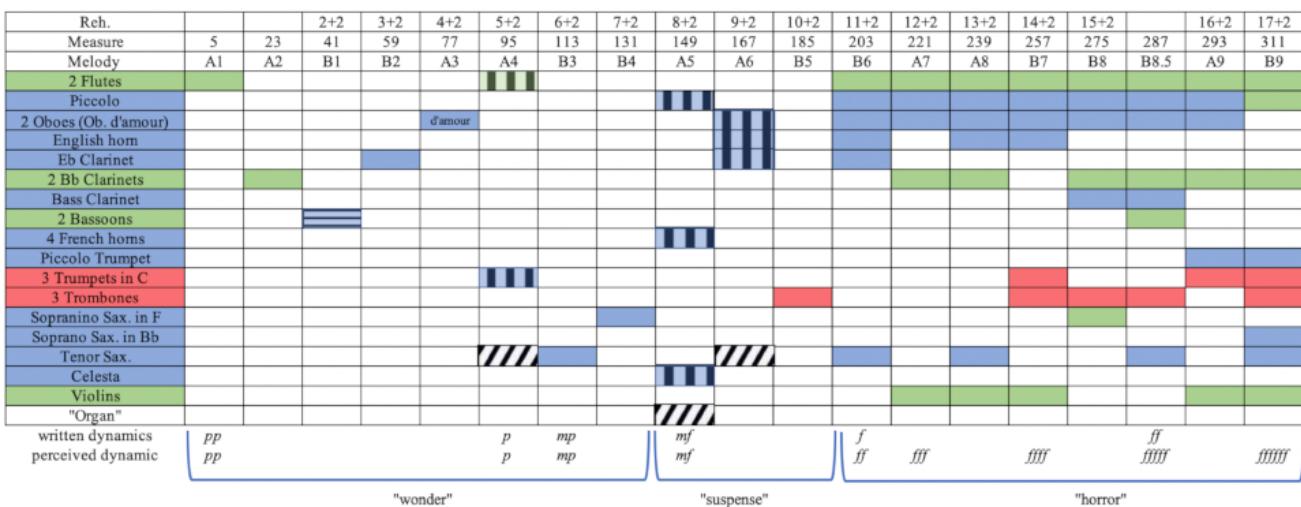
P > C > S

Example 10. Menuet antique, Organ Sound at the End

Piano

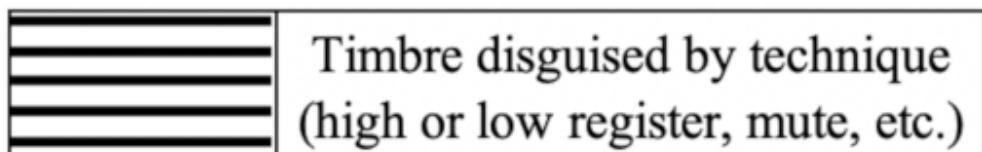
The musical score consists of two staves. The left staff is for the Piano, showing a series of eighth-note chords. The right staff is for a large ensemble of instruments, including Flute, Piccolo, Oboe, Clarinet, Bass Clarinet, Bassoon, Contrabassoon, Horn in F, Trumpet, Trombone, Trombone Tubo, Timpani, Harp, Violin I, Violin II, Viola, Cello, and Bass. The ensemble parts are primarily composed of eighth-note chords. A blue oval highlights a specific eighth-note chord in the piano part, and a blue box highlights the final ensemble section. The score is in 3/4 time, with a key signature of three sharps. Dynamics include *ff*, *pizz.*, *arco*, and *ff*.

Example 11. SPC Groupings in *Boléro*



Example 12. Parallel Timbres in *Boléro*

Rehearsal number	2+2	3+2	6+2	7+2
Measure	41	59	113	131
Melody	B1	B2	B3	B4
Eb Clarinet		High		
High Bassoon	"Low"			
Sopranino to Soprano Sax.				High
Tenor Sax.			Low	



Example 13. Illusory Saxophone in *Boléro*

Rehearsal number	5+2
Measure	95
Melody	A4
Flute	
Muted Trumpet	
Illusory Tenor Sax.	

p
mf

	Timbre masked by novel combination
	Illusory timbre- novel combination creates illusory sound

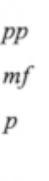
Example 14. Illusory to Real Sounds in *Boléro*

2+2	3+2	5+2	6+2	7+2
41	59	95	113	131
B1	B2	A4	B3	B4
			Tenor Sax	Soprano Sax
Bassoon "Tenor Sax"	Eb Clarinet "Soprano Sax"	Fl. + muted Tpt. "Tenor Sax"		
Illusory				Real

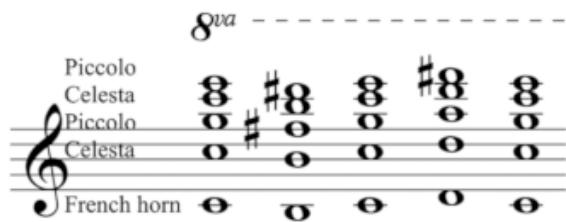
Example 15. Illusory Organ in *Boléro*

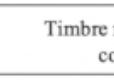
Fused Piccolos, French horn, Celesta =
 “Phantasmagoric Instrument” (Bregman 1990)
 Like an organ stop (Kennan and Grantham 2002)
 Illusory Organ

Harmonic series in *Boléro*,
 m. 149

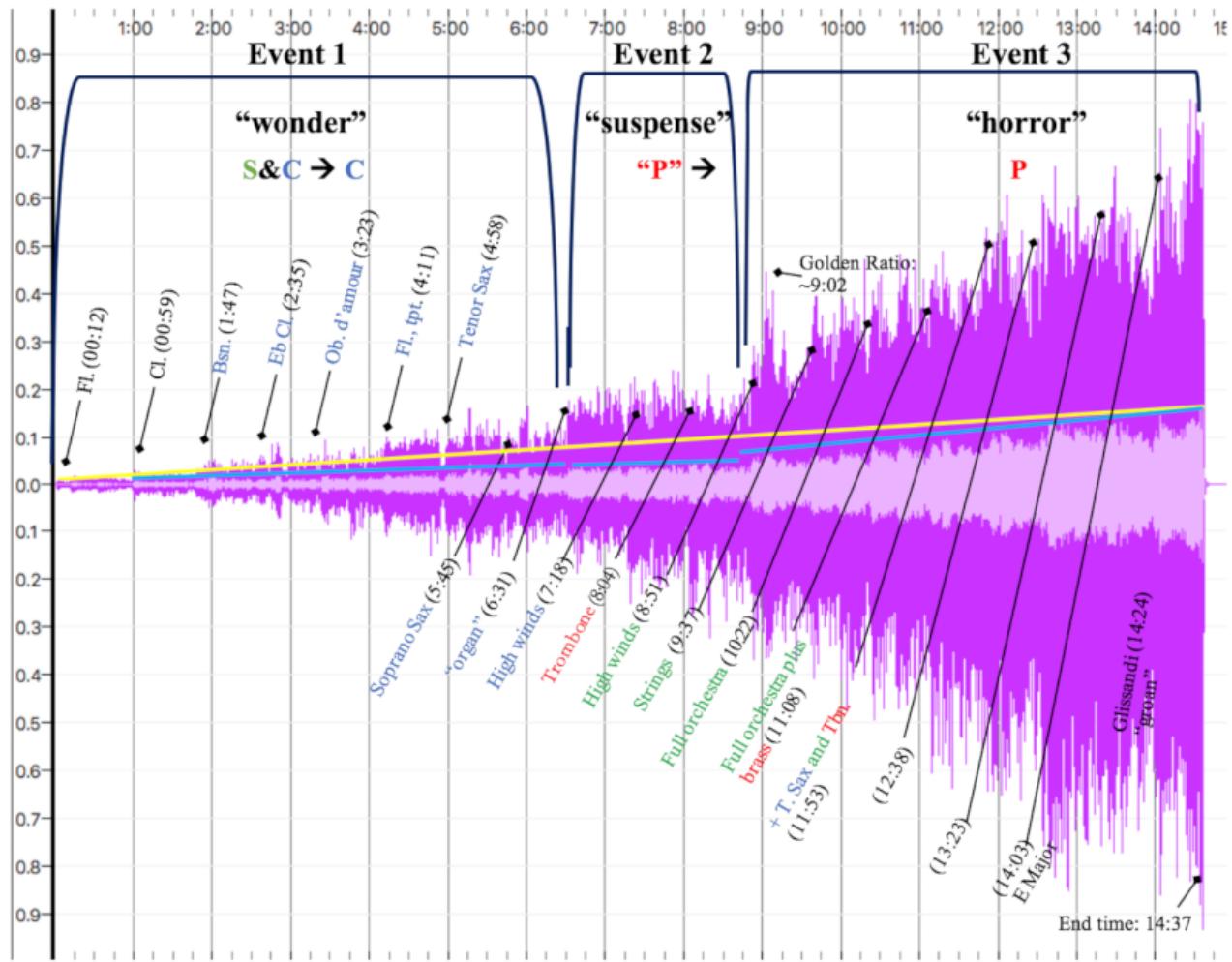
Rehearsal number	8+2
Measure	149
Melody	A5
2 Piccolos	
French horn	
Celesta	
"Organ"	

pp
mf
p



	Timbre masked by novel combination
	Illusory timbre- novel combination creates illusory sound

Example 16. Waveform of *Boléro*



Dark shade of the waveform displays the highest amplitude

Lighter shade at the center of the waveform reveals the Root Mean Square (RMS)

Yellow line connects the peaks from the beginning to the end in one continuous crescendo

Blue line connects beginning peaks within each section of form

Example 17. Bassoon's Dies irae (DI) in Concerto for the Left Hand

Head/tail motive of DI

28

Bsn. 

Alto 

Vlle. 

29

Bsn. 

Alto 

Vlle. 

Example 18. Timbral Transformation in Concerto for the Left Hand, Scherzo

S > **P** > **C**

Metric grouping of trills: 1 1 1 1 2 1 1

25

Flute

Clarinet in A

Horn

Harp

Piano

Violin I

Violin II

Viola

Cello

Piccolo

Magical effect

Harp > Illusory Harp

Example 19. Auditory Scenes in Concerto for the Left Hand

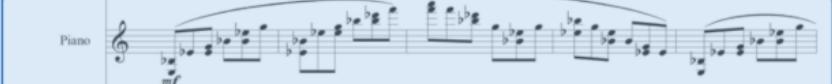
Reh.	24 + 8	25	27	28	30 + 1	31	32	33	34 + 1	35	36	37	38	
Meas.	238	246	269	277	304	314	324	336	345	356	365	373	382	
	trills initiate shift				A	B	A	B	A	B	A	B		
	4 auditory streams													
Scenes	1. "Dream" accompaniment	illusory harp in piano, high winds with melody			illusory harp in strings		illusory harp in winds		piano arpeggios					Fl., Bb Cl., harp, pno.
Themes	2. Scherzo (B)			piano		piano		high picc.	piano			Tpt.		horns
	3. Dies irae (A)		high bsn.		muted trombone	illusory muted tpt.	real muted trumpet	divisi violins	high winds, divisi violins	Fl., Ob., C. a., Eb Cl., Bb. Cl., vlns.		Pic., Ob., Tpt., violins,		
	4. "March" accompaniment			cellos	violas, cellos, bass + snare	cellos and basses	violas, cellos, bass + woodblock	Bb Cl., Bass Cl., Bsn., Cello +w. bl. & Snare	Horns, bsn., pno, basses +w. bl. & Snare	B. Cl., Bsn., Cbsn., Tbn., Tba., pno., violas, cellos, basses, +w. bl., timb.	Cl. b., Bsn., Cbsn., Horns, Trb., Tba., Vla., Cello, Cb., +Trgl., Snare, Timb., Cymb.			
	dynamic marking	pp			p		mp	mf	f					ff

Reh. 34+1 m. 345

1. Scherzo Piccolo 

2. Dies irae Trumpet in C 

3. March Triangle Wood Block 

4. Dream Piano 

Violin I 

Violin II 

Viola 

Cello 

Bass 

Illusory harps in strings, winds, and piano.

Example 20. Illusory Harp in the Concerto for the Left Hand

25

Piccolo

Flute

Harp *8vo* *div.*

Piano

Violin I *pizz.*

Violin II *pizz.*

Viola *pizz.* *div.*

Illusory Harp Sounds in Piano and String pizzicato

Example 21. Illusory to Real Trumpet in the Concerto for the Left Hand

33

Illusory Muted Trumpet

Oboe
English Horn

Clarinet
Bass Clarinet

Wood Block

Viola

Cello

Bass

mp

34+1

Piccolo

p

Trumpet in C

Con sord.

mf

Triangle
Wood Block

+ W. BL.

8

Piano

mf

Violin I

mp

div. in 4

Violin II

mp

div. in 4

Viola

pizz.

Cello

pizz.

Bass

pizz.

Real Muted Trumpet

Example 22. Opening Motives in the Concerto for the Left Hand

Motive A

Contra**bassoon** *Lento* *mp*

Motive B

Horn in F *p*

Example 23. The First Marked Moment in the Concerto for the Left Hand

Motive A (cont.)

Contra**bassoon**

Motive B

Horns

m. 6

Deceptive slide to motive B

Continuation of E minor – shift to C major – C^{6/5}

m. 11

Slide back to key of motive A, now E major

“stall”

Color instrument

Power instrument

“magical”
effect

harmonic
event

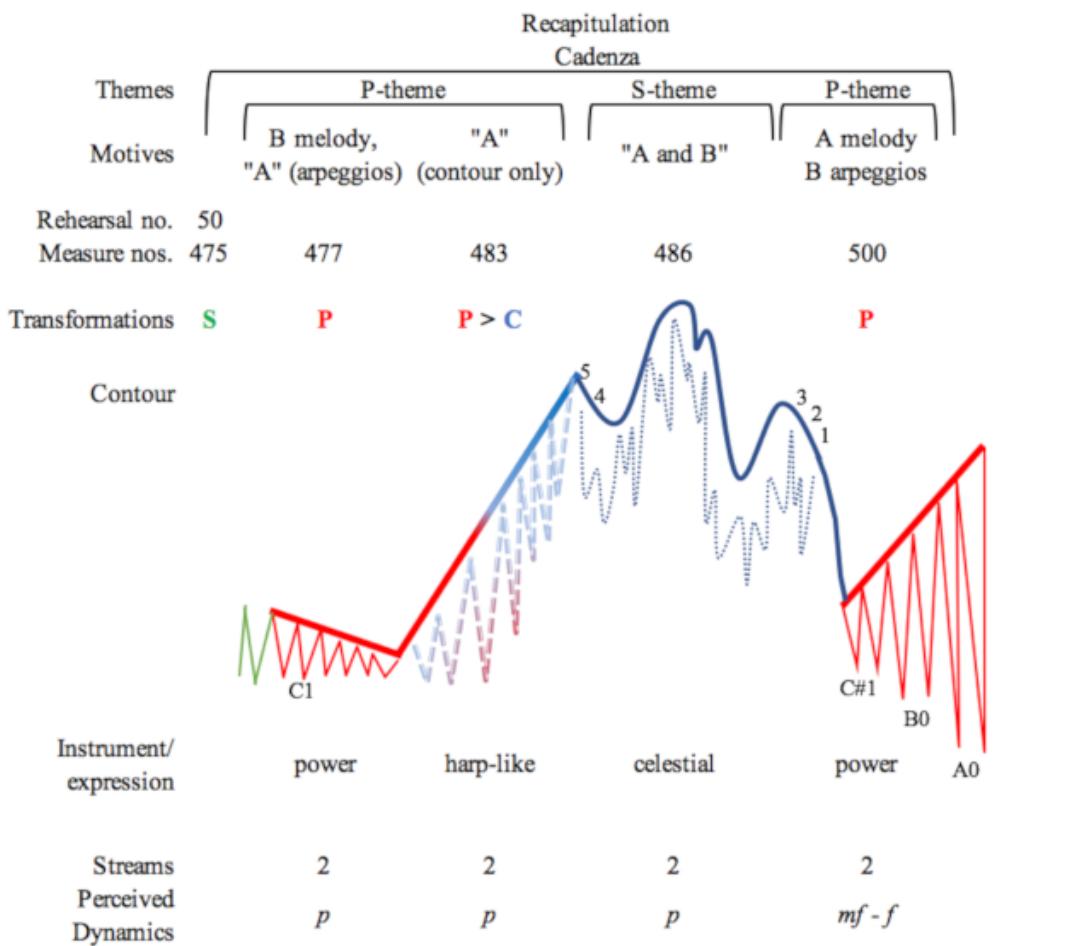
Example 24. Contour and SPC transformations in the Concerto for the Left Hand, Exposition

Motives and Themes	Exposition				
	P-theme				S-theme
Rehearsal number	1	2	3	//	8+4 melody and accompaniment
Transformations	C > P	P > C > S	S/P		S
Contour					
Instrument	Contrabassoon	> Horns	Cbn. & D.B. > b. cl. & Vcl. > C.a. & Vla. > A Cl. & picc.	Strings and High Winds/ Brass	Piano
Streams	1	1	1	2	2
Dynamics	<i>p</i>	<i>p</i>	<i>pp</i> < <i>f</i>	<i>f</i> <	<i>mf</i>
Expression					Più lento <i>espressivo</i> ~C#5/ F#2-C#4
Pitches	E1-Bb2	Bb3&2-G3&2	E1-F#6	A6/Bb4	

Green= Standard Red= Power Blue= Color

 Solid line = single stream
 Shaded solid line= timbral transformation via magical effect

Example 25. Concerto for the Left Hand, Cadenza

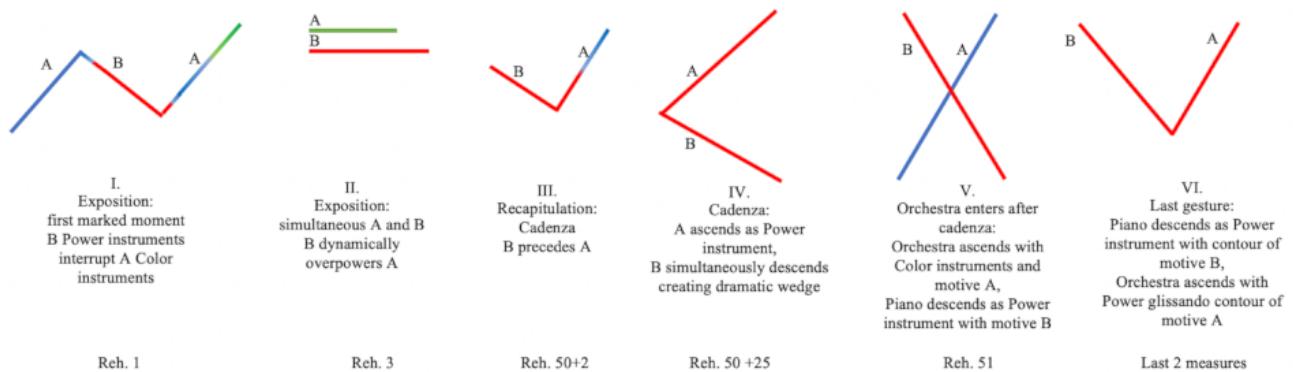


Green= Standard Red= Power Blue= Color

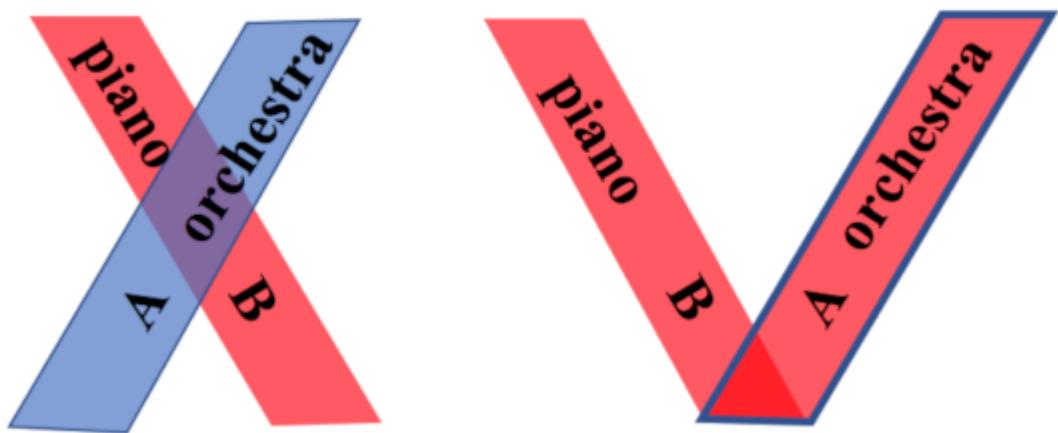
-  Solid line = single stream
-  Shaded solid line = timbral transformation via magical effect
-  Double dotted line = glissando in real or illusory harp

-  Contour with dots = organized timbre based on contour/technique
-  Contour with solid line = illusory instrument created by contour/technique
-  Arpeggios away from melodic line

Example 26. Instrumental Grouping and Contour Shapes of Motives A and B



Example 27. Contour and SPC Groupings of Concerto's Ending (Reh. 50 to End), Enlarged Section V and VI from Example 26

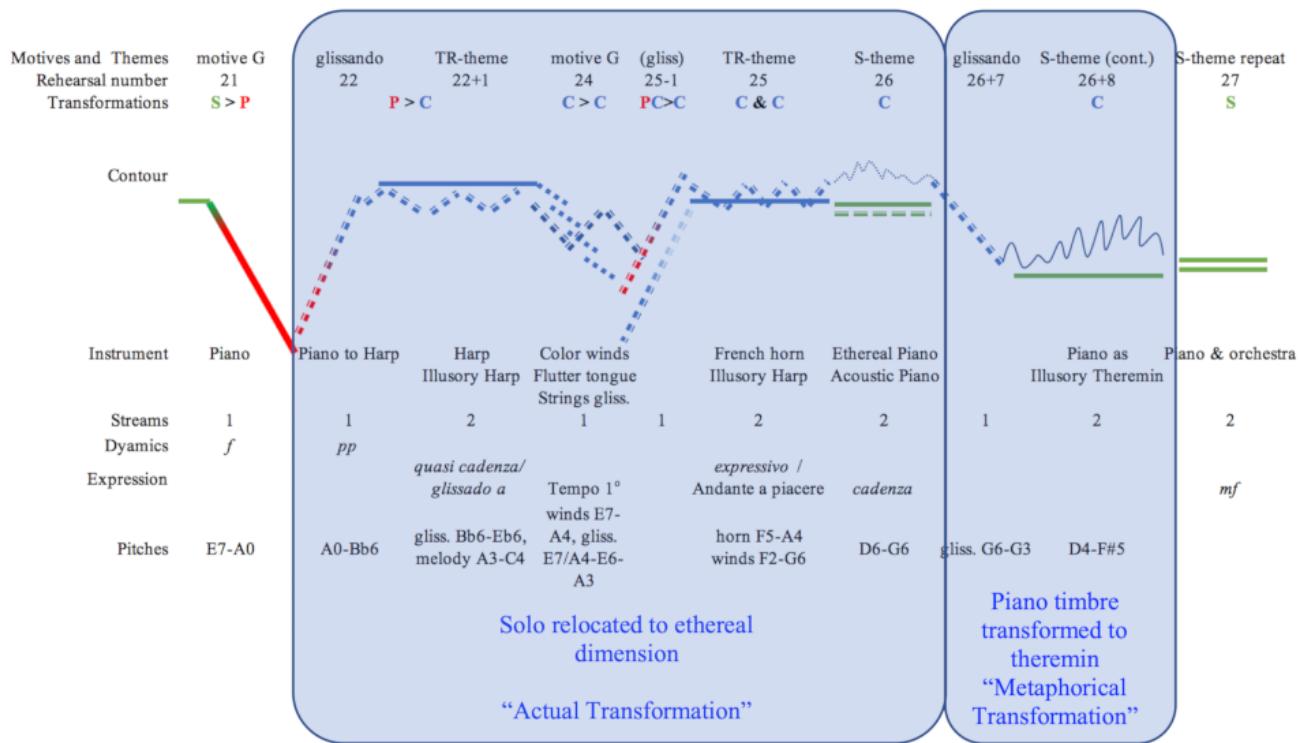


Example 28. Form of Concerto in G Major (adapted tables from Beavers 2020)

P		TR [1] [2] 2.2]					S	
R1		S1					R2	
Orchestra and piano			- piano			Piano "G" Piano "G" Piano	Piano	Orchestra and piano
Key areas:	GM		B-Dorian		F#M/m			EM
Stylistic references:	Music box/ carnival music	Marching band	Orchestra	Spanish guitar/jazz/"Gershwin"			"Real piano" with stylized jazz elements	Piano with Orchestral repeat
Rehearsal nos.:	2 3		4 5 6			7		9

P	1	TR	2	2.2]	S	Coda
R3		S3			2.2]	[cadenza]
Orchestra and piano	Piano "G"	Harp	Ethereal orch.	Harp "G"	Fr. horn	Ethereal Piano to theremin
GM BbM	AM/m					GM
Tutti: Orchestra overpowers piano's recap of P-theme	Piano ("jazz piano") builds like moving into solo recapitulation	Timbral transformation	Remains in ethereal orchestra			Timbral transformation
18 19	20 21	22	24 25	26		29

Example 29. Contour and SPC transformations in the Concerto in G Major, Recapitulation



Green= Standard Red= Power Blue= Color

Solid line = single stream

Shaded solid line = timbral transformation via magical effect

Double dotted line = glissando in real or illusory harp

Single dotted line = organized timbre with extended technique

Contour with dots = organized timbre based on contour/technique

Contour with solid line = illusory instrument created by contour/technique

Arpeggios away from melodic line

Example 30. Locations on the stage (with credit to Jackie Landgraf)

