

MTO 21.4 Examples: Schachter, Structural Levels in South Indian Music

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

<http://www.mtosmt.org/issues/mto.15.21.4/mto.15.21.4.schachter.php>

Figure 1. Common South Indian instruments

(a) *Vina*



Photo: *en.wikipedia.org* (PD)

(d) *Kanjira*



Photo: *en.wikipedia.org* (PD)

(b) *Mridangam*



Photo: *en.wikipedia.org* (PD)

(e) *Tambura*



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(c) *Ghatam*



Photo: *en.wikipedia.org* (PD)

(f) *Sruti Box*



Photo: *srutibox.co.uk*
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Example 1. Structural levels in Karnatak music

<i>foreground</i>	<i>gamaka</i> (ornamentation)
<i>middleground</i>	<i>svara</i> (scale degree)
	<i>prayoga</i> (phrase)
<i>background</i>	"basic structure"

Example 2. The "basic structure"

a) *sa* b) *sa-pa-sa* c) basic structure

Example 3. Common variants of the basic structure

(1) Standard basic structures

(2) "Initial descent" basic structures

(3) "Band-limited" basic structure (ex. Punnagavarali raga)

(4) "Plagal" basic structure (ex. Lalitha raga)

(= $\hat{5}$ $\hat{1}$ $\hat{5}$ $\hat{1}$ $\hat{5}$ $\hat{1}$)

(5) "Expanded" basic structure (two interpretations)

Example 4. Sample passage rendered in *svara* notation and Western notation

Raga: Varali (S R1 G1 M2 P D1 N3 S)

Tala: Adi (4 + 2 + 2)

G , G , G , , S | G , G , | G , , R R ||
 Ka va va kan - da va va en - nai

Ka va va kan - da va va en - nai

Example 5. Karnatak *svaras*

Scale deg.	<i>Svara</i>	<i>Svara</i> (full name)	Sanskrit definition (Rowell 1999)	Western
î	<i>Sa</i>	<i>Shadja</i> [<i>ma</i>]	“Born of the six organs (of speech)”	Do
â	<i>Ri</i>	<i>Rishabha</i>	“Like a bull”	Re
ã	<i>Ga</i>	<i>Gandhara</i>	“The fragrant note”	Mi
ä	<i>Ma</i>	<i>Madhyama</i>	“The middlemost note”	Fa
å	<i>Pa</i>	<i>Panchama</i>	“The fifth note”	Sol
â	<i>Dha</i>	<i>Dhaivata</i>	[etymology unclear]	La
ã	<i>Ni</i>	<i>Nishada</i>	“The final note”	Ti

Example 6. Karnatak disposition of the octave

î â ã ä å â ã

S R1 R2 R3 G1 G2 G3 M1 M2 P D1 D2 D3 N1 N2 N3

Example 7. The *Melakarta* scales

<i>Shuddha Madhyama</i> (perfect fourth)			<i>Prati Madhyama</i> (raised fourth)		
#	Name	Scale	#	Name	Scale
1. Indu Chakra			7. Rishi Chakra (b2, bb3)		
1	<i>Kanakangi</i>	S R ₁ G ₁ M ₁ P D ₁ N ₁ S'	37	<i>Salagam</i>	S R ₁ G ₁ M ₂ P D ₁ N ₁ S'
2	<i>Ratnangi</i>	S R ₁ G ₁ M ₁ P D ₁ N ₂ S'	38	<i>Jalarnavam</i>	S R ₁ G ₁ M ₂ P D ₁ N ₂ S'
3	<i>Ganamurti</i>	S R ₁ G ₁ M ₁ P D ₁ N ₃ S'	39	<i>Jhalavarali</i>	S R ₁ G ₁ M ₂ P D ₁ N ₃ S'
4	<i>Vanaspati</i>	S R ₁ G ₁ M ₁ P D ₂ N ₂ S'	40	<i>Navaneetam</i>	S R ₁ G ₁ M ₂ P D ₂ N ₂ S'
5	<i>Manavati</i>	S R ₁ G ₁ M ₁ P D ₂ N ₃ S'	41	<i>Pavani</i>	S R ₁ G ₁ M ₂ P D ₂ N ₃ S'
6	<i>Tanarupi</i>	S R ₁ G ₁ M ₁ P D ₃ N ₃ S'	42	<i>Raghupriya</i>	S R ₁ G ₁ M ₂ P D ₃ N ₃ S'
2. Netra Chakra			8. Vasu Chakra (b2, b3)		
7	<i>Senavati</i>	S R ₁ G ₂ M ₁ P D ₁ N ₁ S'	43	<i>Gavambhodi</i>	S R ₁ G ₂ M ₂ P D ₁ N ₁ S'
8	<i>Hanumatodi</i>	S R ₁ G ₂ M ₁ P D ₁ N ₂ S'	44	<i>Bhavapriya</i>	S R ₁ G ₂ M ₂ P D ₁ N ₂ S'
9	<i>Dhenuka</i>	S R ₁ G ₂ M ₁ P D ₁ N ₃ S'	45	<i>Shubhapantuvarali</i>	S R ₁ G ₂ M ₂ P D ₁ N ₃ S'
10	<i>Natakapriya</i>	S R ₁ G ₂ M ₁ P D ₂ N ₂ S'	46	<i>Shadvidamargini</i>	S R ₁ G ₂ M ₂ P D ₂ N ₂ S'
11	<i>Kokilapriya</i>	S R ₁ G ₂ M ₁ P D ₂ N ₃ S'	47	<i>Suvarnangi</i>	S R ₁ G ₂ M ₂ P D ₂ N ₃ S'
12	<i>Rupavati</i>	S R ₁ G ₂ M ₁ P D ₃ N ₃ S'	48	<i>Divyamani</i>	S R ₁ G ₂ M ₂ P D ₃ N ₃ S'
3. Agni Chakra			9. Brahma Chakra		
13	<i>Gayakapriya</i>	S R ₁ G ₃ M ₁ P D ₁ N ₁ S'	49	<i>Dhavalambari</i>	S R ₁ G ₃ M ₂ P D ₁ N ₁ S'
14	<i>Vakulabharanam</i>	S R ₁ G ₃ M ₁ P D ₁ N ₂ S'	50	<i>Namanarayani</i>	S R ₁ G ₃ M ₂ P D ₁ N ₂ S'
15	<i>Mayamalavagowla</i>	S R ₁ G ₃ M ₁ P D ₁ N ₃ S'	51	<i>Kamavardani</i>	S R ₁ G ₃ M ₂ P D ₁ N ₃ S'
16	<i>Chakravakam</i>	S R ₁ G ₃ M ₁ P D ₂ N ₂ S'	52	<i>Ramapriya</i>	S R ₁ G ₃ M ₂ P D ₂ N ₂ S'
17	<i>Suryakantam</i>	S R ₁ G ₃ M ₁ P D ₂ N ₃ S'	53	<i>Gamanasbrama</i>	S R ₁ G ₃ M ₂ P D ₂ N ₃ S'
18	<i>Hatakambari</i>	S R ₁ G ₃ M ₁ P D ₃ N ₃ S'	54	<i>Viswambari</i>	S R ₁ G ₃ M ₂ P D ₃ N ₃ S'
4. Veda Chakra			10. Disi Chakra		
19	<i>Jhankaradhwani</i>	S R ₂ G ₂ M ₁ P D ₁ N ₁ S'	55	<i>Shamalangi</i>	S R ₂ G ₂ M ₂ P D ₁ N ₁ S'
20	<i>Natabhairavi</i>	S R ₂ G ₂ M ₁ P D ₁ N ₂ S'	56	<i>Shanmukhapriya</i>	S R ₂ G ₂ M ₂ P D ₁ N ₂ S'
21	<i>Keeravani</i>	S R ₂ G ₂ M ₁ P D ₁ N ₃ S'	57	<i>Simhendramadhyamam</i>	S R ₂ G ₂ M ₂ P D ₁ N ₃ S'
22	<i>Kharabrapriya</i>	S R ₂ G ₂ M ₁ P D ₂ N ₂ S'	58	<i>Hemavati</i>	S R ₂ G ₂ M ₂ P D ₂ N ₂ S'
23	<i>Gourimanohari</i>	S R ₂ G ₂ M ₁ P D ₂ N ₃ S'	59	<i>Dharmavati</i>	S R ₂ G ₂ M ₂ P D ₂ N ₃ S'
24	<i>Varunapriya</i>	S R ₂ G ₂ M ₁ P D ₃ N ₃ S'	60	<i>Neetimati</i>	S R ₂ G ₂ M ₂ P D ₃ N ₃ S'
5. Bana Chakra			11. Rudra Chakra		
25	<i>Mararanjani</i>	S R ₂ G ₃ M ₁ P D ₁ N ₁ S'	61	<i>Kantamani</i>	S R ₂ G ₃ M ₂ P D ₁ N ₁ S'
26	<i>Charukesi</i>	S R ₂ G ₃ M ₁ P D ₁ N ₂ S'	62	<i>Rishabhapriya</i>	S R ₂ G ₃ M ₂ P D ₁ N ₂ S'
27	<i>Sarasangi</i>	S R ₂ G ₃ M ₁ P D ₁ N ₃ S'	63	<i>Latangi</i>	S R ₂ G ₃ M ₂ P D ₁ N ₃ S'
28	<i>Harikambhoji</i>	S R ₂ G ₃ M ₁ P D ₂ N ₂ S'	64	<i>Vachaspati</i>	S R ₂ G ₃ M ₂ P D ₂ N ₂ S'
29	<i>Dheerasankarabharanam</i>	S R ₂ G ₃ M ₁ P D ₂ N ₃ S'	65	<i>Mechakalyani</i>	S R ₂ G ₃ M ₂ P D ₂ N ₃ S'
30	<i>Naganandini</i>	S R ₂ G ₃ M ₁ P D ₃ N ₃ S'	66	<i>Chitrambari</i>	S R ₂ G ₃ M ₂ P D ₃ N ₃ S'
6. Rutu Chakra			12. Aditya Chakra		
31	<i>Yagapriya</i>	S R ₃ G ₃ M ₁ P D ₁ N ₁ S'	67	<i>Sucharitra</i>	S R ₃ G ₃ M ₂ P D ₁ N ₁ S'
32	<i>Ragavardhini</i>	S R ₃ G ₃ M ₁ P D ₁ N ₂ S'	68	<i>Jyoti swarupini</i>	S R ₃ G ₃ M ₂ P D ₁ N ₂ S'
33	<i>Gangeyabhushani</i>	S R ₃ G ₃ M ₁ P D ₁ N ₃ S'	69	<i>Dhatuwardani</i>	S R ₃ G ₃ M ₂ P D ₁ N ₃ S'
34	<i>Vagadbeeswari</i>	S R ₃ G ₃ M ₁ P D ₂ N ₂ S'	70	<i>Nasikabhushani</i>	S R ₃ G ₃ M ₂ P D ₂ N ₂ S'
35	<i>Shulini</i>	S R ₃ G ₃ M ₁ P D ₂ N ₃ S'	71	<i>Kosalam</i>	S R ₃ G ₃ M ₂ P D ₂ N ₃ S'
36	<i>Chalanata</i>	S R ₃ G ₃ M ₁ P D ₃ N ₃ S'	72	<i>Rasikapriya</i>	S R ₃ G ₃ M ₂ P D ₃ N ₃ S'

Example 8. Common *gamaka* types

N.B.: notable omission in Dikshitar's list ([1904] 2010): “mordent” (Powers 1958a), a.k.a. “abata” (Nijenhuis 2001)

In the following examples, the bottom staff shows the *svara* in both Western and Indian notation, with the appropriate *gamaka* symbol from Dikshitar's system placed above the Western notation. The top staff shows an approximation of how the *gamaka* would sound in the specified *raga*. (Although it is only explicitly marked in the *vali*, the *ettra-jaru*, and the *erakka-jaru*, sliding between pitches is typical of all *gamakas* except those based on *vina* hammer-on and pull-off techniques, namely the *spurhita*, *kbandippu*, and *ravai*.)

<i>Gamaka</i>	Description	Western approximation
<i>Kampita</i>	Oscillation	Vibrato, trill, or tremolo
<i>Spuritha</i>	<i>Svara</i> preceded by accent from below	Accented lower grace note
<i>Pratyaghata</i>	Rapid single oscillation above <i>svara</i>	Pralltriller/inverted mordent
<i>Nokku</i>	<i>Svara</i> decorated by <i>svara</i> above	Elongated upper appoggiatura
<i>Kbandippu</i>	<i>Svara</i> preceded by accent from above	Accented upper grace note
<i>Ravai</i>	Rapid double-neighbor motion	Turn
<i>Ettra-jaru</i>	Ascending slide	Glissando
<i>Erakka-jaru</i>	Descending slide	Glissando
<i>Odukkal</i>	<i>Svara</i> decorated by <i>svara</i> below	Elongated lower appoggiatura
<i>Orikkai</i>	<i>Svara</i> quickly flicks up to higher <i>svara</i>	Échappée
<i>Vali</i>	“Circular” motion above/around <i>svara</i>	Portamento

	<p><i>Kampita</i> (between <i>svarasthanas</i>) (<i>raga</i>: Mayamalavagowla)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>D</p>	<p><i>Kampita</i> (wide) (<i>raga</i>: Bhairavi)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>N</p>	<p><i>Kampita</i> (narrow) (Sankarabharanam)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>R</p>
	<p><i>Spurbhita</i> (Mayamalavagowla)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>M G G M M</p>	<p><i>Pratyaghata</i> (Sankarabharanam)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>N S N S</p>	<p><i>Nokku</i> (Kalyani)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>M G M P</p>
	<p><i>Khandippu</i> (Mayamalavagowla)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>M P M G</p>	<p><i>Ravai</i> (Mayamalavagowla)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>M P M G</p>	
	<p><i>Ettra-jaru</i> (Lalitha)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>D S D</p>	<p><i>Erakka-jaru</i> (Mayamalavagowla)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>S P S</p>	
	<p><i>Odukkal</i> (Mayamalavagowla)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>D P D P</p>	<p><i>Orikkai</i> (Sankarabharanam)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>N S N D P</p>	
	<p><i>Vali</i> (Kambhoji)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>M G M P</p>	<p>"Mordent" / <i>abata</i> (Sankarabharanam)</p> <p>FOREGROUND</p> <p>MIDDLEGROUND</p> <p>M P M G</p>	

Example 9a. Karaikudi S. Subramanian's notational system

Excerpt from *varnam* "Viribhoni" by Pacchimiriam Adiyappa (Recording: Karaikudi S. Subramanian, private recording)

Subramanian's notation shows multiple representations of the same music, overlaid vertically (Subramanian 1985, 344).

The top layer (in the row marked "B") represents "prescriptive" notation of the flow of the composition at the *svara* level, using solfege; this is how Karnatak music has traditionally been notated (see Govinda Rao, 2003, 2006, 2009a, 2009b). Next are layers featuring Subramanian's unique notational contributions: a "descriptive" account of the *gamaka* surface, represented (a) in solfege, parsing the *gamaka* into internal *svara* referents, with additional notations for characteristic *vina* techniques such as slides and string-pulls; and (b) graphically, with pitch on the x-axis and time on the y-axis. At bottom, Subramanian provides Western notation of both the "prescriptive" (*svara*-level) and "descriptive" (*gamaka*-level) notation streams.

Raga: Bhairavi (S G2 R2 G2 M1 P D2 N2 S – S N2 D1 P M1 G2 R2 S)

Tala: Ata (5 + 5 + 2 + 2)

The notation system consists of several layers:

- Top Layer (Prescriptive):** Solfege notation (S, G, R, M, P, D, N, S) with rhythmic markings (1-2, 1-4) and a row labeled "KSS".
- Middle Layer (Descriptive):** Solfege notation with arrows indicating slides and string-pulls, and graphical pitch-time curves.
- Bottom Layer (Western Notation):** Western musical notation on staves, showing the melodic line and accompaniment.

The notation is organized into five measures, numbered 1 to 5 at the bottom.

Example 9b. Karaikudi S. Subramanian's notational system

Excerpt from "Sarali Varisai" by Purandara Dasa, 15th century (Recording: Karaikudi S. Subramanian, private recording)

Here Subramanian notates a precursory exercise in the Sarali Varisai, a set of graded exercises in Mayamalavagowla raga learned by most students of Karnatak music (Subramanian, unpublished manuscript). At the slowest tempo ("Speed 1," at top), the *kampitas* on *ri, ga, dha,* and *ni* are rendered with evocative swirls. In Subramanian's recording, he repeats Speed 2 twice, Speed 3 four times, and Speed 4 eight times (so that each speed occupies exactly one *tala* cycle).

SARALI VARISAI
(A GRAPHIC PRESENTATION)
FOR BEGINNERS

Speed 1									Speed 1									
AROHANA									AVAROHANA									
Ś									Ś									
N									N									
d									d									
P									P									
m									m									
G									G									
r									r									
S									S									
P									P									
	S	r	G	m	P	d	N	Ś		Ś	N	d	P	m	G	r	S	
Speed 2									Speed 2									
Ś									Ś									
N									N									
d									d									
P									P									
m									m									
G									G									
r									r									
S									S									
P									P									
	S	r	G	m	P	d	N	Ś		Ś	N	d	P	m	G	r	S	
Speed 3									Speed 4									
Ś									Ś									
N									N									
d									d									
P									P									
m									m									
G									G									
r									r									
S									S									
P									P									
	Sr	Gm	Pd	NS	SN	dP	mG	rS		Sr	Gm	Pd	NS	SN	dP	mG	rS	

Example 10. Hierarchical *gamaka* structure in Mayamalavagowla *raga*

S R G M P D N S

Example 11. *Gamakas* “softening” augmented intervals in Mayamalavagowla *raga*

R G D N

Example 12. *Gamaka* in Varali *raga*

S N D P M G R S M G

Example 13. Isomorphisms between foreground *gamakas* and middleground *svaras/prayogas*

Mayamalavagowla *raga* paraphrase

S R G M G R S S R G R S

retrograde paraphrase

Example 14. Linear middleground manifests as structurally anchored foreground (excerpt from Tyagaraja, “Vidulaku Mrokkeda”; Mayamalavagowla *raga*)

tha ko

N S R S N D P D N D P M P D P M G R G M

Example 15. Linear ascent in Kambhoji *raga*)

S R G M P D S

Example 16a. Analytical ambiguity in *gamaka* analysis. Kambhoji *raga*

S R G

Example 16b. Analytical ambiguity in *gamaka* analysis. Mayamalavagowla raga

one-voice

OR

two-voice

P D N D P

Example 17. The basic structure of the *kriti*

pallavi *anupallavi* *charanam*

sa pa sa sa

Example 18. Tyagaraja, “Meru Samana”: introductory *pallavi* phrase (Recording: Lalgudi Jayaraman 2004)

Mayamalavagowla *raga* (S R1 G3 M1 P D1 N3 S)
Adi *tala* (4 + 2 + 2)

Tyagaraja (1767-1844)

The musical score for Example 18 consists of three staves. The top staff shows an introductory phrase with a long note followed by a series of notes. The middle staff is labeled *pallavi* and contains the vocal line with the lyrics "Me - ru sa - ma - na Me - ru....". The bottom staff shows the corresponding melodic line with raga notation: S N S R G M G R R G R S N S S.

Example 19. Tyagaraja, “O Rangasayi”: *pallavi* (Recording: O.S. Thyagarajan 2000)

[Open PDF Score](#)

Example 20. Ambiguity in *pallavi* background readings (Tyagaraja, “O Rangasayi”)

(a) privileging ascending basic structure

(b) privileging *sa* prolongation

(c) two-voice reading (**not emic!)

pallavi

Cycle/sangati: 1 _____ 2 _____ 3 _____ 4 _____ 6 _____

Example 21. Tyagaraja, “Vidulaku Mrokkeda” (Recording: Karaikudi S. Subramanian, private recording)

a. structural analysis

pallavi *anupallavi* *charanam*

Cycle/sangati: 1 _____ *sa* _____ *pa* _____ 5 _____ 7 _____ 8 _____ 8 _____ *sa* _____ 13 _____ 15 _____ 16 _____ 17 _____ 19 _____ 21 _____ 23 _____ 24 _____ *sa* _____ 26 _____

b. transcription

[Open PDF Score](#)

Example 22. Nested iterations of the basic structure

pallavi *anupallavi* *charanam*

sa pa sa sa sa

Example 23. Muthuswamy Dikshitar, “Anandesvarena”: *pallavi* and *anupallavi* (Recording: T. M. Krishna 2006)

a. structural analysis

pallavi *anupallavi* etc.

sa pa sa

Cycle/sangati: 1 _____ 3 _____ 4 _____ 5 _____ 6 _____

b. transcription

[Open PDF Score](#)

Example 24. Papanasam Sivan, “Ka Va Va”: *pallavi* and *anupallavi* (Recording: T. M. Krishna 2009b)

a. structural analysis

pallavi *anupallavi* etc.

sa pa sa

Cycle/sangati: 1 _____ 2 _____ 3 _____ 5 _____ 6 _____ 9 _____ 11 _____

b. transcription

[Open PDF Score](#)

Example 25. Bombay Jayashree, *alapana* in Bhairavi *raga* (Recording: Bombay Jayashree 2009)

a. structural analysis

Musical notation for Example 25, structural analysis. The notation is on a single staff with a treble clef. It shows a melodic line with various note values and rests. Above the staff, the measures are numbered: 1, 2, 4, 7, 8, 11, 16, 18, 22, 23, 24. Below the staff, the syllables 'sa', 'pa', 'sa', and 'sa' are written under specific notes. A horizontal line with vertical stems connects these syllables across the staff. A large slur covers the entire phrase from measure 1 to 24.

b. transcription

[Open PDF Score](#)

Example 26. T. M. Krishna, short *alapana* in Varali *raga* (Recording: T. M. Krishna 2009b)

a. structural analysis

Musical notation for Example 26, structural analysis. The notation is on a single staff with a treble clef. It shows a melodic line with various note values and rests. Above the staff, the measures are numbered: 1, 2, 3. Below the staff, the syllables 'sa', 'pa', 'sa', and 'sa' are written under specific notes. A horizontal line with vertical stems connects these syllables across the staff. A large slur covers the entire phrase from measure 1 to 3. A dashed line indicates a specific melodic contour or ornamentation.

b. transcription

Varali raga (S R1 G1 M2 P D1 N3 S)

Phrase: 1

FOREGROUND

MIDDLEGROUND

D N S R G M P D N S P M

2 3

G N D N D P M G M P D P D P M

pallavi begins

elides with: Ka *etc.*

G R S S R G R G

Example 27. T. M. Krishna, long *alapana* in Varali *raga* (Recording: T. M. Krishna 2009a)

a. structural analysis

Phrase: 1 3 9 12 14 15 25 40 50 53 56 63

b. transcription

[Open PDF Score](#)