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Structural Levels in South Indian Music*

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ABSTRACT: In the present study, I propose a theory of structural levels in Karnatak music, the classical music of South India. In the characteristic patterns of melodic ornamentation and phrase construction that contribute to the identity of a raga, as well as in formal approaches to composition and improvisation, Karnatak musical practice involves sophisticated elaborations of simple voice-leading strands that themselves elaborate a normative background structure. My theory draws on precedents in Indian musical scholarship, firsthand accounts of practitioners, and close analysis of performances (including those of T. M. Krishna, Bombay Jayashree, Lalgudi Jayaraman, Ranganayaki Rajagopalan, and Karaikudi S. Subramanian) and compositions (including those by Tyagaraja, Muthuswamy Dikshitar, and Papanasam Sivan).

I. Introduction

[1] In the present study, I propose a theory of structural levels in Karnatak music, the classical music of South India. In the characteristic patterns of melodic ornamentation and phrase construction that contribute to the identity of a raga, as well as in formal approaches to composition and improvisation, Karnatak musical practice involves sophisticated elaborations of simple voice-leading strands that themselves elaborate a normative background structure. This conceptual framework has significant precedent both in Indian musical scholarship and in anecdotal accounts by practitioners; with the support of close analysis of well-known compositions and performers, my theory synthesizes and expands these strands of thought, contending that widely accepted structural level-based accounts of improvisational practice also extend to theoretical systems, raga structure, and compositional practice.

[2] For readers new to Karnatak music, click here to read a brief introduction to the history, instruments, and essentials of South Indian music. I follow this section with a concise summary of my theory of structural levels in Karnatak music, accompanied by a critical discussion of the article's methodology and attendant theoretical backdrop. The remainder of the article is dedicated to supporting analysis, working successively from details of the musical surface to the basic tonal structure undergirding compositional and improvisational practice.

II. Structural Levels in Karnatak Music; Cultural and Methodological Concerns

[3] In this article, I use the term "structural levels" more or less consistently with its application in twentieth-century Western music theory: the notion that we can conceptualize a given piece of music as a complex of hierarchically-related strata, in which foreground levels can be parsed as elaborations (or "implications") of deeper, background levels (Berry 1980, 20). For the purposes of this study, I focus exclusively on structural levels as they manifest within the domain of pitch. Of course, the very idea of pitch undergoing operations through a musical form requires the transpiration of time to make sense; I only mean to say that I will leave considerations of structural levels as they apply to *tala* to later studies.(1)

[4] I propose that the pitch language of Karnatak music divides into four interrelated but distinct structural levels, which I refer to using the familiar terms "foreground," "middleground," and "background" (**Example 1**). Occupying the musical foreground—the immediate aural experience of the listener—is *gamaka*, the characteristic ornamentation attendant with every *raga*. In the middleground we find the *svara*, or scale degree.(2) At a more distant middleground layer, these *svaras* are grouped into *prayogas*, characteristic phrases particular to a given *raga*. Finally, in the background, these *prayogas* outline a simple voice-leading structure spanning a composition or improvisation, which I refer to throughout this article as the "basic structure."

[5] The basic structure, shown in **Example 2**, consists of: (a) prolongation of *madhya sa*, the lowest tonic note within standard vocal range; (b) an upward ascent (often through *pa*, the fifth) to a prolongation of *tara sa*, the upper tonic an octave higher; (c) descent to *madhya sa*. The basic structure can be thought of as an elaborative expansion of *sa*, and as I will demonstrate in my examples below, it is recursive within various sub-sections of a composition, as well as between structural levels. It moreover shares notable homologies with different elements of Karnatak theory and practice: the 1–5–8 tones of the continuous drone, as well as the standard ascent-descent (*arohana-avarohana*) representation of *raga* scales in scholarly treatises.

[6] The basic structure should not be taken so much as a universal axiom, but rather as a normative archetype of Karnatak compositional and improvisational practice: though not present in every case, it nonetheless predominates; in absence, it defines expectations against which divergences are felt; and for many composers and performers, it even serves as a conscious formal model for compositions and improvisations. **Example 3** shows the most common variants of the basic structure as it manifests in Karnatak compositional and improvisational practice; these will be discussed in greater detail throughout the article.

[7] Before detailing the argument for my theory of structural levels, I would like to say a few words about the impetus for and methodology of this study. Growing up in the Boston suburbs, I first encountered Karnatak music in Richard Wolf's seminar on South Indian music at Harvard in the spring of 2008. Initial fascination grew into obsession, and after graduating in 2009, I spent the 2009–10 academic year on a John K. Paine fellowship in Chennai, India, studying *vina* and voice with Karaikudi S. Subramanian, a ninth-generation *vina* virtuoso and pedagogue. While making no claims to approaching anything like mastery, I did make sufficient progress in my time there to perform as part of the Tyagaraja festival at the Ramakrishna Mutt in February 2010, followed by an hour-long solo recital at the Brhaddhvani Institute in April 2010. I have since been back to Chennai on three additional research trips, and in November 2012 I arranged a weeklong residency for Dr. Subramanian at my current institution, the University of Michigan.

[8] Thus my involvement with South Indian music has been that of a curious, impassioned outsider. As a Western-trained pianist and composer, my experience learning Karnatak music essentially from scratch was strikingly similar to that described by Harold Powers in the preface of his 1958 dissertation:

> I had one great disadvantage and one great advantage. The disadvantage was that, not having been born and brought up in a cultivate South Indian household, I had at first no 'feel' whatsoever for Carnatic music; I had none of the sort of 'common knowledge,' none of the unconscious musical assumptions, that any individual who is not deaf begins to acquire from infancy. The advantage was that I had been trained in Western music, from the performance and compositional angles both; hence, a great deal of Carnatic theory which might been difficult for an untrained but acculturated Indian was relatively easy to "translate" for a trained but

unacculturated Westerner. (Powers 1958a, i)

To be sure, part of the reason that my Western training was so "transferable" was simply that the combination of an academically oriented mind and some sustained elbow grease will make at least some progress in any endeavor. However, as Powers implies throughout his dissertation, and as I experienced firsthand, there are very real parallels between Karnatak music and Western music that make each more accessible to the other than their practitioners might assume. As Robert Morris has observed, in both cultures, concerts consist primarily of highly complex, through-composed musical works, the bulk of which are devotional in subject and were composed generations ago by a small cadre of composers comprising a musical canon (2001, 74). To that, I would also add: like those in jazz, bluegrass, and other American music traditions, Karnatak compositional forms designate particular spaces for improvisation within the tonal and metrical framework of each composition. Moreover, mastering Karnatak music and Western art music alike requires many years of intensive study, usually through private instruction with a qualified teacher, and, correspondingly, the demographics of audiences and practitioners skew heavily towards the socioeconomically advantaged.

[9] I bring these parallels up not to underplay the very real differences between Western and Karnatak musics, nor to suggest that Western analytical methods or conceptual systems can be blindly applied to the study of Karnatak music. I simply mean to emphasize to those who are new to Karnatak music that the chasm between the two is not as distant as phenotypes might suggest, and that a surprisingly reasonable amount of applied time will open the doors to one of the world's great musical traditions. Throughout this paper, I frequently point out when Western and Karnatak musical elements or concepts overlap; I must stress that all such cross-comparisons are approximate analogies, whose sole purpose is to give readers better versed in one tradition a more immediate reference for understanding the other.

[10] My thoughts on structural levels in Karnatak music started percolating almost immediately upon my initial immersion in the fall of 2009, but in an inarticulate, private way. It was not until returning to the United States and enrolling in Kevin Korsyn's "Schenker I" course at the University of Michigan in the fall of 2010 that I first encountered Western theoretical literature on structural levels; I was struck by how resonant the concepts in the course were (not in specific detail, but in spirit) with what I had heard and felt so palpably in Karnatak music. As I developed my thoughts over the ensuing years, I took great pains to balance my ineluctably etic perspective with a thorough grounding in emic approaches to the same subject. Studying Indian music as a Westerner can be particularly fraught, given the subcontinent's history of British occupation; what is more, Karnatak culture prides itself on a careful policing of its musical borders, which not only explains the striking vitality of its common-practice strictures in a global age of pluralistic media, but also its relative insularity with respect to the West.[(3)] My goal is to live up to Bruno Latour's ideals of the values of etic research (1979): that I am humble enough to know when to discount biases as they inevitably surface, while contributing only those observations and syntheses more readily perceptible from without than from within.

[11] As it turns out, I was fortunate in this regard. There are many notable precedents for my theory of structural levels both in Indian scholarship and in contemporary performance practice, and I found that my contribution was more connecting the dots between disparate extant strands than it was suggesting something altogether new and foreign. In the arguments below, I will present my case for a theory of structural levels through a combination of references to Indian theoretical literature, accounts from Karnatak performers and composers (including several personal interviews), close analysis of compositions and improvisations, and my own experience as a performer and scholar. In general, I steered clear of a few of the hallmarks of ethnomusicological writing, especially what Kofi Agawu describes as "the quietly assumed and increasingly utilized homology between musical structure and social structure" (1990, 265). Writers on Karnatak music (both Western and Indian) frequently relate musical phenomena to analogues in Indian culture; for example, Lewis Rowell makes a connection between the *tala* system and the classical Indian conception of time as cyclical (1992, 180–224), and in my own studies, Karaikudi S. Subramanian (my *vina* teacher) instructed me to model my performance of *gamaka* oscillations on the South Indian manner of bobbling one's head to express assent or confusion. Despite the evocativeness of these examples, for the present study I judged that recourse to extramusical homologies might draw too much attention away from appreciating my argument in purely musical terms (whatever that means). I hope that this article might complement, rather than supplant, the many other extant accounts that focus on cultural, contextual perspectives. As Agawu insightfully adds, "the musical object is far too complex to allow a satisfactory view from only one angle" (1990, 265).

[12] I also must comment on issues of notation. Karnatak music is ubiquitously described as an oral tradition, but, like many oral traditions, much of what we know of its past comes from written transmission. In addition to the important series of treatises mentioned in the expository sub-page above, many works of the great composers survived due to the diligence of their students in circulating transcriptions of their masters' performances; the composer Tyagaraja's prominence in particular is due in large part to the "rudimentary publications project" of his disciples (L. Subramanian 2006, 91). Most notation of Karnatak music (past and present) consists of written-out *svara* syllables (i.e. solfège) placed above the corresponding lyrics of the composition (henceforth, "*svara* notation"—see **Example 4**). The *svaras* give the performer an approximate guide to the melody; details of exact rhythmic placement and rich *gamaka* elaborations are left for performers to realize through knowledge gained by oral transmission.

[13] *Svara* notation is sufficiently obscure to Western audiences that its use would pose a significant barrier to accessibility; however, well-justified controversy surrounds the prospect of rendering Karnatak music in Western notation, with most skepticism falling into two categories. The first concern is ethical in nature: that using staff notation represents an undue imposition of Western values. In my mind, the critical question here is whether or not Western notation transforms or distorts Karnatak music in the act of transcription. Because of the close similarity between Western and Indian scale systems (discussed further below in Section III), Western notation can represent practically identical information as *svara* notation, with the added benefit of greater rhythmic precision. (*Svara* notation generally only indicates note onsets but not how long notes sustain.) There exists significant precedent for successfully rendering Karnatak music in Western notation by Indian scholars (Mudaliyar [1893] 1982, Kumar and Stackhouse 1987, K. Subramanian 1986) and Western scholars (Powers 1958a, Nijenhuis 1977 and 2001, Morris 2001 and 2011) alike. The second concern is more theoretical in nature; as Richard Wolf summarizes, staff notation "makes conceptually distinct units appear to be identical, and it differentiates units that are conceived to be the same" (1989, 176–77). Thus, even if staff notation represents a reasonably faithful transliteration of the musical impulses, we must be very vigilant in parsing surface features (and differentiating structural levels), so as to sensitively reflect the emic musical framework. To this end, in this article, I render all analytical examples with approximations of the immediate musical surface (*gamaka*) represented in Western notation alone, and the corresponding middleground (*svara*) represented in both Western notation and *svara* solfège. Only notation at the *svara* level would be typical of traditional Indian notation and pedagogy; my *gamaka* renderings are meant (a) as a guide to readers unfamiliar with the characteristic *gamaka* of the various *ragas*, (b) to call attention to the recursive interplay between structural levels, especially between the highly interrelated foreground and middleground; and (c) to demonstrate the stylistic idiosyncrasies of the artists whose performances I transcribed for the present study. In my transcriptions, *sa* (tonic) is represented exclusively by the note C, a common scholarly practice in rendering Karnatak music and other modal musics, and accidentals are attached to the notes they modify.[(4)]

[14] The remainder of this article is roughly laid out from foreground level to the background level. I first discuss the role of structural levels as they manifest at the conceptual level of *raga*. I then analyze the musical foreground, discussing the various types of *gamaka* and examining their close relationship to the *svaras* and *prayogas* of the middleground. Finally, I demonstrate the basic structure (and its interrelationship with the foreground and middleground) as it appears in both compositional and improvisational practice.

III. *Raga*

[15] The word *raga* comes from the Sanskrit term for "color," or more precisely, "the act of coloring." The musical concept of *raga* reflects its etymological origin; not only does it imply the specific *svaras, gamakas*, and *prayogas* possible for use, but also an overarching affect. Many *ragas* have historically been associated with particular times of the day, as well as specific physiological and/or emotional responses. All *ragas* center around a fixed tonic (reinforced in performance by the continuous drone), which remains constant not only throughout a song but generally throughout an entire concert.[(5)] The potential for tonal stagnancy is balanced by the incredible variety of available modes within the *raga* system. As A. M. C. Mudaliyar explains in his 1893 treatise, "The unfettered use of accidentals in European Music is regarded by the KARNATA [sic] musician as due to want of principle and system; for he has at his own disposal no less than 70 other modes or MELAKARTAS and nearly a thousand derivative RAGAS to which he can divert his attention when he is tired of what correspond to the European Major and Minor scales" (1982, 9).

[16] The Karnatak conception of pitch space overlaps considerably with Western systems (**Example 5**). Karnatak music theory observes the phenomenon of octave equivalency, designating a given pitch and another pitch with doubled frequency as individuals of the same class. The octave is divided into seven scale degrees separated by step (*svaras*); moreover, these *svaras* can occupy any one of twelve total positions in the octave (*svarasthanas*), which are spaced in accordance with Western half steps although differing in temperament.[(6)] Performers usually only refer to the *svaras* by their shorthand, *sa–ri–ga–ma–pa–dha–ni*, which align with the Western solfège syllables *do–re–mi–fa–sol–la–si*. Just as the Western solfège syllables originate from a Sapphic hymn to St. John,[(7)] the Indian syllables derive from descriptive and/or evocative terms in Sanskrit (Rowell 1999, 32).

[17] Mudaliyar describes the traditional imagery surrounding each *svara*:[(8)]

> ***Sa*** is the sound produced by the Prince of Birds, the Peacock, at moments of exultation and rapture, i.e., when the clouds gather in the sky with a low moan portending the commencement of the rainy season, which is the period of its highest joy and happiness.
> ***Ri*** is the low of the Cow in calling for her calf, dragged away from her.
> ***Ga*** is the bleat of the Goat in the midst of the flock, calling for the aid of his fellows.
> ***Ma*** is the cry uttered by the Heron, seated on the bank of a pool, on seeing the gathering of a cloud and anticipating an inundation which would force her to flee elsewhere for safety.
> ***Pa*** is the note sounded by the KOKILA—the Indian nightingale—at spring tide, when after a silence of six months, it hails the brightest period of the year and tastes the first sprouts of the new season with an ebullition of joy.
> ***Dha*** is the neigh of the Horse at the moment when his rider approaches him for a drive, or descends from him after his work for the day, when he is anxious to have his usual meal.
> ***Ni*** is the yell of the Elephant with his extended proboscis when the Mahout attacks the back of his head with a scimitar. (1982, 13)

[18] He goes on to make several interesting observations about the tonal implications of these images:

> It is curious that the most important notes of the scale, viz., the Key-note, its Fifth above and its Fifth below, (C, G and F) [*sic*] are identified with the sounds produced by Birds, the Peacock, the Heron, and the Cuckoo, and the rest with those of Animals. Again only the Key-note and its Fifth are represented by sounds produced on *joyous* occasions, while the others are stated to be cries uttered at moments of fright, pain or anxiety. The increase in the size of the animals towards the end, concurrent with the increase in the pitch of the notes and culminating in the huge cry of the largest of Indian quadrupeds, is also noteworthy. (1982, 13)

[19] The representation of the root and fifth as "joyful," contrasting with the more "anxious" representations of other scale degrees, implies a developed sense of stability and instability, or consonance and dissonance. In all Karnatak *ragas*, the *sa–pa* fifth remains inviolable, and these tones are furthermore usually rendered in performance as plain *svaras* (unadorned with *gamaka*). The second (*ri*), third (*ga*), sixth (*dha*), and seventh (*ni*) are the most "unstable" of the tones and the most conducive to complex *gamaka*; these each exist in three possible varieties. The second and sixth each appear as minor, major, and augmented intervals over the bass (R1, R2, R3; D1, D2, D3), while the third and seventh each appear as diminished, minor, and major intervals over the bass (G1, G2, G3; N1, N2, N3), yielding an appealing symmetry between the S–M1 and P–S tetrachords. Ma, the fourth, appears in two varieties: perfect and augmented (M1, M2). These dispositional possibilities are summarized in **Example 6**.

[20] While certain varieties of *svaras* could potentially be enharmonic with one another, *svaras* in a given *raga* will not overlap; there may only be one variety of each *svara* in either the *arohana* (ascent) or *avarohana* (descent) of a *raga*, though they may differ between these. Combinatorially, these restrictions yield 72 possible seven-tone scales, a theoretical construct called the *melakarta*, shown in **Example 7.**[(9)] While many of these scales have specific *ragas* associated with them, as a whole they are more accurately described as "parent" collections from which *ragas* may be derived. Thousands more *ragas* than the 72 *melakartas* are theoretically possible because of the following complications: (a) Multiple *ragas* can share the same scale, as long as they differentiate themselves with distinct *gamakas* and *prayogas*; (b) *Ragas* can omit one, two, or more *svaras* from a

"parent" *melakarta*, yielding many heptatonic, pentatonic, and even tetratonic "derivative" (*janya*) *ragas*; (c) *Ragas* may have different numbers and different varieties of tones present in ascent and descent; (d) *Ragas* may take circuitous, "zig-zag" routes (*vakra*) in ascent or descent, in which certain *svaras* appear out of order or more than once.

[21] Simultaneously strict and expansive, the constraints of *raga* create a holistic aesthetic based on consistency. Tones outside the specified *svaras* can only be accessed within the context of permissible *gamakas*, and the available set of *gamakas* and *prayogas* rigidly shapes the pitch language available for use in "valid" compositions and improvisations.[(10)] In *janya ragas* and *vakra ragas*, characteristic *lakshanas* actually infiltrate the spelling of the scale, suggesting a conceptual intermingling between the middleground structural levels of *svara* and *prayoga*. Two examples: (1) the *ragas* Kambhoji and Sahana both derive from the *melakarta* scale Harikambhoji (S R2 G3 M1 P D2 N2 S, comparable to the Western Mixolydian mode). Kambhoji is usually written as S R G M P D S in ascent (skipping N) and S N D P M G R S in descent, while Sahana is written as S R G M P M D N S in ascent and S N D P M G M R G R S in descent (Janakiraman 2002). In this case, Kambhoji is rendered with purely linear *arohana* and *avarohana* (albeit skipping N on the ascent), while the characteristic *prayogas* of Sahana are evocatively reflected in the *vakra* spelling of the scale in both directions. (2) The *raga* Bhairavi derives from the *melakarta* scale Natabhairavi (S R2 G2 M1 P D1 N2 S, comparable to the Western natural minor scale). However, it utilizes different *svaras* in ascent and descent: the *arohana* is rendered as S G2 R2 G2 M1 P D2 N2 S, with circuitous *vakra* at the beginning and *dha* raised to D2 (*bhashanga*), while the *avarohana* is rendered as S N2 D1 P M1 G2 R2 S.

[22] In addition to the interrelationship between a *raga*'s spelling and its characteristic *prayogas*, structural relationships are furthermore indicated by the hierarchical relationships of its *svaras*. Typical *raga* theory identifies *amsa svaras* (or *jiva svaras*, "life-giving tones") within the scale, which are afforded greater stress within the phraseology, and phrases theoretically conform to rigidly specified *ghana svaras*, or starting tones, and *nyasa svaras*, or ending tones (Sambamoorthy 1964, Shankar 1999). In addition to these individuating elements, the more generalized shape of the basic structure ties *ragas* to one another. The basic structure is reflected most strongly in *raga* theory by (a) the inflexibility of the *sa–pa* perfect fifth; (b) the consistent depiction of *ragas* in *arohana* and *avarohana*—that is, ascending from *madhya sa* to *tara sa* and descending back to *madhya sa*; (c) the metaphorical experience of tension (instability) in scale degrees $\hat{2}$, $\hat{3}$, $\hat{6}$, and $\hat{7}$ (plus $\hat{4}$ to a lesser extent, given its own fifth-relation to tonic) desiring resolution (stability) in scale degrees $\hat{1}$ and $\hat{5}$.

[23] There are a few categories of *raga* whose restrictions preclude strict adherence to the standard basic structure, instead yielding some of the variants catalogued earlier in Example 3. One is the group of *janya ragas* ("derivative" subsets of *melakartas*) that happen to omit *pa*. In performances of pieces set in these *ragas*, the continuous drone will sometimes omit *pa*, usually supplanting it in these cases with *ma* if it is present in the *raga*.[(11)] Without the stabilizing influence of *pa*, the ear may recalibrate the *raga's* tonicity to privilege the "plagal" *ma–sa* fifth-relation; in Lalitha *raga*, for example (S R1 G3 M1 D1 N3 S), *ma* can be heard as "pseudo-tonic" while *sa*, a fifth-higher, takes over as "pseudo-fifth."[(12)] While solmization remains consistent in Karnatak music—*sa* is *sa*, no exceptions—key facets of *raga* expression change in Lalitha *raga* in ways that lend structural weight to the *ma–sa* fifth. Crucially, the injunction that all compositions and improvisations end on *madhya sa* will sometimes relax in these *ragas*; for example, T. M. Krishna ends his interpretation of Muthuswamy Dikshitar's "Hiranmayim" (Lalitha *raga*): with the phrase *sa–ri–ga–ma*, letting *ma* trail in the air as if fulfilling "tonic" function. (Listen to the end of his performance in **Audio Example 1**; Krishna 2009b.) Another exceptional category is the small collection of "band-limited" *ragas*, which extend from *ni–ni*, *dha–dha*, or *pa–pa* within a one-octave range. While ascent to *tara sa* is impossible in these *ragas* by definition, they nonetheless compensate by gravitating around *madhya sa* and *madhya pa*, the latter acting as the uppermost reach of the condensed arch.

[24] As mentioned earlier in paragraph [6], these variants comprise just a small fraction of the Karnatak performance repertory. In my own experience, as well in Karnatak practice, they are felt as divergences from expectations set by the far more prevalent standard basic structure (Subramanian, pers. comm.).

IV. *Gamaka, Svara, Prayoga*

[25] Perhaps the most distinguishing feature of Karnatak music is *gamaka*, the highly systematized ornamentation that pervades the musical texture. Even compared to that of Hindustani music in the North, Karnatak ornamentation in particular is unique for its ubiquity (in most *ragas*, very few notes are rendered "plainly"), its ornateness (many *gamakas* are

complex and impose virtuosic demands on the performer), and its fixity (particular *gamakas* are rigidly defined by the constraints of the *raga*). The pervasiveness of *gamaka* in the musical foreground can present a barrier for uninitiated listeners, for whom the relationship to the simpler melodic underpinnings at the *svara* level may not be clear. Moreover, because of the premium placed on vocal style (even in instrumental technique), most *gamakas* consist of a combination of pitch bends and slides, creating a much less "digital" musical surface than in most other musical traditions.

[26] In an important sense, it is artificial to separate *gamaka* and *svara* into separate structural levels. Sambamoorthy explains, "*Gamaka* is inseparable from even the simplest phrase. It is not a mere accidental ornament: it is an essential part of the melodic structure" (1964, [I] 54). T. M. Krishna goes even further: "the *gamaka* is an expression of the *svara* and the *svara's* musical identity binds it to the *gamaka*" (2013, 51). In practice, *gamaka* and *svara* form an endlessly recursive dynamic equilibrium; *gamaka* entails *svara*, *svara* entails *gamaka*. On the one hand, they work to individuate the *raga* through the idiosyncratic restrictions constraining acceptable ornamentation and phraseology in each *raga*; on the other hand, they work to generalize the aesthetic of Karnatak music by subtly reinforcing consistent hierarchical relationships.

[27] With this all in mind, I nonetheless present them as distinct structural layers in this article for the following reasons: (1) clarity; (2) value of distinct observations to be made; (3) accordance with Indian treatises, which consistently present them as separate domains; (4) they are sometimes taught separately for pedagogical purposes (as in the Karaikudi school of *vina* performance); (5) contemporary cataloguing of *ragas* and composition notations, which parse *gamaka* from *svara*. That complex *gamakas* "reduce" to simpler *svaras* leads me to present *gamaka*, what the ear most literally encounters, as foreground, and *svara*, an abstraction thereof, in the middleground. Despite this taxonomy, the reader should consistently bear in mind that these two concepts are inextricably linked in Karnatak practice, and I have found that resolving chicken-and-egg questions once and for all—Which comes first? Is *gamaka* a decorative layer on the underlying *svaras*? Or are the *svaras* just a useful shorthand guide to "real" *gamaka* activity?—is unwise, not only out of respect for emic conceptual perspectives but also because of very real analytical problems that arise when taking an overly hierarchical approach. I will include a few examples of these issues in the ensuing discussion.

[28] Like with many other aspects of Indian classical music, treatises have historically discussed *gamaka* in a commingled mixture of technical and metaphorical language. The 13th-century treatise *Yajnavalka Siksa* (author unknown) described *raga* with purely evocative description: ornaments produce sounds of the "roaring of a lion, of the thunderclap in the manner of monkeys jumping from branch to branch . . . like the kissing of a child by its mother. . . or the carrying by a tigress of her cubs in her mouth without hurting them, or the gait of an intoxicated elephant" (Powers 1958a, 125). The Jain author Parsvadeva, in his 1250 treatise *Sangitasamayasara*, writes, "The seven ornaments (*gamaka*) are these: bursting forth, quivering, melting, meandering, impacting, oscillating, and manifesting [the three registers]," then continuing on to explain the respective musical contexts in more detail (Rowell 1999, 39). Modern conceptions of *gamaka* primarily derive from the work of Subbarama Dikshitar, the grandson of the great composer Muttuswamy Dishitar. In his landmark treatise *Sangita Sampradaya-Pradasini*, Dikshitar parses characteristic ornamentation patterns into ten specific *gamaka* types (2010). Each of these types may appear alone or in combination within a particular *svara*; in *tala* with a slower *akshara* (beat), one *svara* may feature many such small *gamaka* cells. While some later scholars (Powers 1958a, Sambamoorthy 1964, Shankar 1999) have offered alternative *gamaka* taxonomies, Dikshitar's system remains more or less intact today; his specific terminology is still the scholarly standard.[(13)] Dikshitar's ten *gamaka* types are presented in **Example 8.** The only amendment made to Dikshitar's original list is the addition of the "mordent" (Powers 1958a), or "*ahata*" (Nijenhuis 2001), which is quite pervasive in the literature but not explicitly accounted for in Dikshitar's system. Dikshitar's original symbols for each *gamaka* are also included, to show how he would mediate between the *svara* and *gamaka* levels in his notational practice.

[29] At its essence, *gamaka* performs two basic operations: *passing* motion (*jaru*, or slides between *svaras*) and *neighboring* motion (*kampita*, or oscillation, usually between a *svara* and a neighboring pitch, but also potentially "wide," across a *svara,* or "narrow," between a *svara* and a nearby microtone). Any given *svara's* characteristic ornamentation may feature one or both of these functions, with varying levels of ornate complexity. Dikshitar's categories simplify an extremely large and diverse set of performance possibilities, and in practice, these *gamaka* "types" will join together in various combinations, even replacing one another depending on the rhythmic context. At slower speeds, an oscillation will generally take the shape of a long *kampita*, while the same *gamaka* rendered at faster speeds will appear as a *nokku*, *odukkal*, or *orikkai*, condensed motions that "stand

for" that essential oscillatory character. The terms *sphurita*, *pratyaghata*, *nokku*, *khandippu*, and *odukkal* differentiate between each of the varieties of incomplete neighbors that may appear in these condensed motions. While the *gamaka* types have long histories independent of their Western analogues, and in execution and style they can sound quite different, the underlying similarities have consistently caught the attention of Western and Karnatak performers and theorists alike; for example, the *ravai* is more often referred to within Karnatak scholarship and practice with the Western terminology of a "turn."

[30] The *jaru*, or slide, is the basic agent of passing function not only between *svaras*, but within the execution of most other *gamakas* as well. *Gamaka* notation indicates the approximated *svarasthanas* (pitch positions) outlining each gesture, between which one will hear very precisely timed pitch slides. Correspondingly, the Karnatak musical surface is highly typified by local pitch indeterminacy (that is, at any given moment one might be betwixt and between). Contemporary representations of *gamaka* utilize metaphorical tools to help better articulate the physical sensation of performing and listening to *gamaka*. For example, Karaikudi S. Subramanian's system of graphic notation—notating time on the *x*-axis and pitch on the *y*-axis —evocatively represents the *kampita* (oscillation) with delightfully paradoxical swirls (see **Example 9**).

[31] When multiple *gamaka* cells are pieced together to fit longer *svaras*, and those *svaras* into *prayogas*, these passing and neighboring functions often combine to steer *raga* expression to a deceptively consistent interpretation of pitch space: namely, the reinforcement of the "consonant" *sa–pa* structural fifth. The *svaras* located a half step on either side of *sa* and *pa* (N3 and D1 encircling the former, M2 and D1 encircling the latter) prohibitively are rendered with *gamakas* in which the underlying *svara* pitch is deflected by oscillation into neighboring *sa* and *pa*; Powers even goes as far as describing the relationship as "upper and lower 'leading tones'" (1958a, 199). This half-step "magnetism" (borrowing Larson's 2012 metaphor from his discussion of musical forces) extends to the other *svaras* as well. *Sa* and *pa*, as consonant tonic–fifth, never feature *gamaka* deflections; "flattened" *svaras* (i.e. G2, N2) deflect downwards by half step into more stable lower neighbors, and "natural" or "raised" *svaras* (i.e. G3, D2) will deflect upwards by half step into more stable upper neighbors (Powers 1958a, 198–99). In Mayamalavagowla *raga* (**Example 10**), the *gamakas* impart hierarchy upon the basic scale of S R1 G3 M1 P D1 N3 S, evincing overwhelming "magnetic pull" to the structural root–fifth and secondary pull to the fourth. R1 and N3 oscillate into *sa*, D1 oscillates into *pa*, and G3 oscillates upwards into the secondary stability of M1, which in certain passages will even itself oscillate upwards into *pa*.(14)

[32] The structural stability of the fifth (and, to a lesser extent, its inverse, the fourth) is reinforced by the tendency of *gamaka* to "soften" imperfect, augmented, and/or diminished melodic leaps by flicking to nearby "consonances." In Mayamalavagowla, two melodic augmented seconds lurk: *ri–ga* and *dha–ni*. In scalar passages moving between these *svaras*, the *gamakas* navigating each of these "unstable" intervals split outwards to emphasize the encapsulating perfect fourths: *ri* and *dha* oscillate downwards into *sa* and *pa*, respectively, while *ga* and *ni* oscillate upwards into *ma* and *pa*, respectively.(15) Note in **Example 11** that the literal frequencies of the third and seventh are only marginally present in the ornate *gamaka* for *ga* and *ni*, respectively.

[33] These phenomena are even more striking in the *raga* Varali, one of the most densely chromatic in the whole *melakarta* system (**Example 12**). The scale for Varali (S R1 G1 M2 P D1 N3 S) consists of nothing but half steps clustered around *sa* and *pa*, with the exception of the doubly-flattened third a half step above the lowered second. The *gamakas* here conform to the expectation for "magnetic" pull towards tonic and fifth, with N3 and R1 oscillating into *sa* and M2 and D1 oscillating into *pa*. Perhaps the most distinguishing feature of this *raga* is the enormous gulf between G1 and M2 (a doubly-augmented second in Western terminology). The *gamaka* helps navigate this treacherous tonal terrain by stipulating that G1 oscillate *upwards* by half step into the *svarasthana* of G2, a foreign *svara* (or "*bhashanga*") to the *raga*. This ingenious ornamentation serves tonal double-duty; not only does it clearly demarcate *ga* from "*ri*" functionality,(16) but it also "softens" the doubly-augmented *ga–ma* chasm by emphasizing the G1–P interval, enharmonically consonant with a perfect fourth.

[34] These hierarchical impulses are reinforced by substantial recursiveness (and even blurring) between *gamaka*, *svara*, and *prayoga*. Ornate *gamakas* adorning *svaras* in slow tempo often closely resemble the contours of *prayogas* at faster subdivisions; though occupying different structural levels, they mutually enforce a consistent interpretation of pitch space. **Example 13** shows scalar passages in Mayamalavagowla raga at different speeds. The quick speed (*svaras* at a quarter *akshara*, i.e. "eighth-note" subdivision) yields very little time for *gamaka*, with many tones ornamented by very quick *nokkus*, *oddukals*,

and/or *orikkais*. The slower speed (*svaras* at the *akshara*, i.e. "half-note" subdivision) yields much more ornate *gamakas* on the more "unstable" tones of *ri* and *ga*. The ornate *gamakas* on *ga–ri* are surprisingly isomorphic with the entire *prayoga* with *svaras* at four times the speed. Thanks to this recursiveness, many possible *svara* combinations can yield practically identical foreground renderings, a phenomenon clearly evident in the wide divergences between the representations of even the most popular compositions in Indian notation collections.(17) This indeterminacy is a major reason I resist describing the relationship between *gamaka* and *svara* as strictly hierarchical.

[35] Moreover, because of the "magnetic" pull of structural tones in Karnatak pitch space, simple linear melodic patterns at the *svara* level often refract into a deceptively angular and leap-oriented musical surface at the *gamaka* level.(18) **Example 14** presents a passage in Mayamalavagowla *raga* from the final *sangati* (variation) of the *pallavi* section of Tyagaraja's *kriti*, "Vidulaku Mrokkeda." The underlying *svaras*, as indicated in the lower staff (and corresponding syllables below), outline a simple stepwise melodic line descending systematically from high *sa* to the brink of low *sa*. The musical foreground, indicated in the upper staff, manifests as a dense texture of decorative activity clustered around the structural tones of *sa*, *pa*, and the secondary *ma*. These structural encirclings are summarized in the *ossia* staff at the top of the example.

[36] Even in less chromatic *ragas*, the root and fifth still exert substantial "magnetic" pull in the melodic foreground, albeit with *gamaka* types and intermediary tones suited to the particular intervallic structure of the *raga*. For example, in Kambhoji (S R2 G3 M1 P D2 S – S N2 D2 P M1 G3 R2 S, skipping N in *arohana*), a linear ascent through the *svaras* yields a musical foreground akin to a major pentatonic mode, with special emphasis on *sa* and *pa* (and secondary emphasis on *ga*, the third). *Ri* is rendered with an *ettra jaru* from *sa* to *ga* and just a short *nokku* flick back down to the expected *svara* pitch; *sa* and *ga* are emphasized at the expense of the "underlying" *ri*. The rendering of *ma* is even more extreme: the literal pitch of the fourth is never sounded, with the *svara* oscillating exclusively between *ga* and *pa*. *Dha* is rendered with identical *gamaka* gesture to *ri*, although it is framed by the more dramatic leap of a fourth between *pa* and *sa*; *ni* is skipped entirely in ascent (**Example 15**).

[37] The example above moreover demonstrates how elusive a definitive hierarchical relationship between the foreground and middleground structural levels can be. The *sa–ri–ga* ascent in Kambhoji suggests different viable analytical readings depending on which structural level we privilege. Giving precedence to the middleground *svaras* contextualizes *ri* as a clear passing tone between *sa* and *ga*, but in listening to the passage, this passing motion seems to be experientially undermined by *gamaka* that spends so little time on *ri* that it more closely suggests a leap from *sa* to *ga*, with *ri* heard as a lower neighbor to *ga* (see **Example 16a**). In Mayamalavagowla *raga*, the linear motion of *pa–dha–ni–dha–pa* (5̂–6̂–7̂–6̂–5̂) at quicker speeds creates an effect approaching the Western ideal of compound melody. *Pa* is rendered plainly, without *gamaka*, while *dha* and *ni* are each represented by an *odukkal* commencing on *pa* and flicking up to the "underlying" *svarasthana* at the last instant (**Example 16b**). While the middleground *svaras* outline a contour of simple linear ascent and descent, the foreground *gamakas* contradictorily imply overall stasis on *pa* with the adornment of upper neighbors of various size. With my Western ears, I can't help but hear this type of passage as compound melody, with the upward flicks tracing a "second voice" above the sustaining *pa* (to be sure, a speculative concept foreign to Karnatak musical thought).

V. Composition and the Basic Structure

[38] Karnatak musical culture centers on the performances of detailed, through-composed masterpieces produced by a small group of canonical composers from past centuries. Concert programs today are dominated by the works of the so-called compositional "Trinity," three contemporaries all curiously hailing from the same tiny southern village of Tiruvarur: Tyagaraja (1767–1847), Muthuswamy Dikshitar (1775–1835), and Syama Sastri (1762–1827). Other canonical composers include Purandara Dasa (1484–1564), best known for developing the core set of Karnatak pedagogical exercises still ubiquitously used by students today; Swati Tirunal (1813–46), the Maharaja of Travancore and an outstanding musician in his private life; and Papanasam Sivan (1890–1973), nicknamed the "Tamil Tyagaraja," who composed classical compositions as well as Tamil film scores.

[39] Karnatak compositions appear in several standardized forms. The most important of these is the *kriti*, a three-part composition marrying technical sophistication with emotional and devotional depth (*bhakti*). The *varnam* is a study piece, analogous to the Western etude, the primary aim of which is to help the performer master the intricacies of a particular *raga*. Other common concert forms include the *thillana*, a dance-derived showpiece with text comprised exclusively of the

nonsense syllables "thi," "la," and "na," the *raga-malika*, a concert closer and the only form to feature multiple *ragas,* as well as smaller forms like the *padam* and *javali*. In this paper, I will focus my discussion of structural levels in compositions primarily on the *kriti*, the central form of the concert tradition.

[40] A *kriti* will be set in one single *raga* and *tala* throughout, and it will generally consist of three main sections: the *pallavi*, the *anupallavi*, and the *charanam*.[(19)] The *pallavi* consists of one short line of poetry, perhaps lasting just one full *tala* cycle (or even a half of a cycle), which is then subjected to progressively complex melodic variations (*sangatis*).[(20)] The *anupallavi* generally contains more elaborate, frenetic *prayogas* than the *pallavi*, serving as the rhetorical apex of the *kriti*; it too tends to feature very few lines of poetry, which may be varied with *sangatis*. The *charanam* generally is based on a longer expanse of poetry, and its main rhetorical function is to bring the *kriti* to a close, often summarizing and tying together material from the *pallavi* and *anupallavi*. In most *kritis*, a statement of the *pallavi* follows each of the *anupallavi* and *charanam* sections as a sort of rhetorical capstone. Given the tonal restrictions of *raga*, *kritis* depend on carefully designed voice-leading architecture to help maintain musical interest. For the remainder of this section, I develop this argument with a more detailed look at how my proposed $\hat{1}$–$\hat{5}$–$\hat{8}$–$\hat{1}$ basic structure manifests within and across each section of the compositional form (**Example 17**).

[41] Indian scholarship has very little to say about the specific tonal architecture of the *kriti*, but there are notable examples of more generalized accounts of the overall melodic trajectory of a compositional structure. A. M. C. Mudaliyar's account describes the registral activity of the melody within each formal section. Although he is vague regarding the finer details of tonal content, Mudaliyar nonetheless seems to consider each of these registral zones as prolongational centers around which a flurry of elaborative activity may unfold:

> The sequence of notes in a melody proceeds more *by degrees* [italics his] . . . following closely the *AROHANA* and *AVAROHANA* of the scales. . . . A clear distinction is however drawn in the latter between the normal, lower and higher octaves, and most melodies are divided into three parts, the first of which called *PALLAVI* or *Chorus* is generally confined to the Bass and Contralto compass, while the *ANUPALLAVI* or the *Second Chorus* almost invariably embraces the higher octaves of the Tenor, and the Treble or Soprano portions—the *CHARANAS* or *Stanzas* ranging within the spheres of the Baritone and Alto voices. (1982, 12)

Mudaliyar is, however, quite specific about how a *kriti* ends: "Every melody should as a rule close with the key-note C or *SHADJAMA* [*sa*]" (Mudaliyar [1893] 1982, 11).

[42] This sketchy, registral account is corroborated in greater or lesser detail by many other twentieth- and twenty-first-century scholars and performers (Sambamoorthy 1964 [III, IV]; Ramakrishna 2012; Janakiraman 2013; T. M. Krishna, pers. comm.; Trichy Sankaran, pers. comm.; K. S. Subramanian, pers. comm.). In summary, Karnatak theory advocates the following general outline of a composition: the *pallavi* tends to explore the middle register, between *madhya sa* and *tara sa* (*madhyama sthayi*); the *alapana* explores the upper register above *tara sa* (*tara sthayi*), and the *charanam* returns to *madhya sa*, often dipping down below into the lowest register (*mudra sthayi*) en route. The ambitus of this contour stems from the capabilities of the human voice; over the course of the *kriti*, the vocalist gradually explores every corner of the vocal range. My proposed basic structure is essentially a more formalized, fleshed-out conception of this conventional account.

[43] As the opening section of the *kriti*, the *pallavi* section fulfills two primary functions at the background level: (a) it introduces *madhya sa,* usually as the organizing *svara* of a prolongational phrase, and (b) it progresses through successively higher-reaching *sangatis* up to *tara sa*, often emphasizing *pa* along the way. Generally speaking, the introductory *pallavi* phrase is set at the bottom of the *madhyama sthayi* (middle register) of the voice. The phrase will almost always conclude with *madhya sa*, which it explicitly prolongs; not only does this leave room for an eventual upward ascent, but it also guarantees the eventual resolution to *madhya sa* for the *kriti* overall, since the phrase is used to bookend the *anupallavi* and *charanam* sections as well.[(21)] **Example 18** features the short *pallavi* phrase of the well-known Tyagaraja *kriti* "Meru Samana," lasting half of a single *tala* cycle. The phrase begins on *madhya sa*, ascends to *ga*, and returns to *madhya sa*, a succinct ascent-descent structure. Even in such a short passage, many performers' interpretations nest a miniature iteration of the *sa–ga–sa* melodic contour in the *gamaka* anticipating the return of *madhya sa* in each successive *pallavi* iteration.

[44] The upward ascent to *tara sa* is usually accomplished in the *pallavi* by a series of *sangatis* (elaborative variations) varying

the introductory *pallavi* phrase. The *sangatis* are increasingly florid and melodically higher-reaching as they progress, creating an effect of linear ascent through the *madhyama sthayi*. At the same time, however, each *sangati* reinforces its identity as a variation by imitating the specific melody of the original introductory *pallavi* phrase in closing (almost always entailing a return to *madhya sa*). Thus, the ascent from *madhya sa* to *tara sa* in the overall basic structure does not form a straight line; it is punctuated by smaller, recursive iterations of the shape within the *pallavi*: motion and stasis at once.

[45] **Example 19** demonstrates the punctuated *sa–sa* ascent in the *pallavi* of the Tyagaraja *kriti* "O Rangasayi" as rendered by the vocalist O. S. Thyagarajan.(22) The bottom staff contains middleground notation (Western and *svara*), while the top staff contains foreground notation (Western only). The opening phrase of the *pallavi* commences and closes on *madhya sa*, with an ambitus restricted to just the third above. Successive *sangatis* emphasize the secondary structural *svara* of *pa*, as well as the *jiva svaras* of *ga* and *dha*. In my hearing, the *jiva svaras*, though central to the special identity of Kambhoji *raga*, are nonetheless presented throughout as subsidiary to the stronger structural centers of *sa* and *pa*. The *ga* is established in the opening *pallavi* phrase as an intermediary target in the context of a *sa*-prolongation, and when it is elaborated in the first *sangati*, we still clearly hear its development in this context. Similarly, the *dha* is first introduced as an upper neighbor to *pa*, and the particular *sangati* elaborating *dha* repeatedly has it "resolve" down to *pa*. When *tara sa* is reached, the performer executes a virtuosic run through the entire *arohana–avarohana* of the *raga*, with *tara ga* (echoing the *madhya ga* of the opening line) as its apex.

[46] Comparable to my exploration of the ambiguous *gamaka–svara* relationship, tracking the linear ascent through iterative *sangatis* yields multiple viable analyses of the *pallavi* section. **Example 20** provides three possible background readings of the *pallavi* of "O Rangasayi." The first two readings I consider to be consistent with Karnatak thought and mutually reinforcing; the first emphasizes the stasis of the *pallavi*'s recursive tonal returns, reading the *sangatis* as successively higher skips above a static *sa*, while the second emphasizes the linear ascent, reading each recurring lower *sa* as melodic skips below these ascending tones. The third, more speculative reading represents these strands as a two-voiced melodic texture; it is not commensurate with emic Karnatak musical thought, but nonetheless it might be evocative for Western listeners primed to hear compound melodic structures. Ultimately, I hear the *pallavi* as presented in the analysis at the end of Example 20: a complete iteration of a basic structure nested within the larger background structure of the composition.

[47] The primary function of the *anupallavi* material is to prolong *tara sa*. Most *anupallavi* sections consist almost entirely of *prayogas* in the *tara sthayi*, elaborating *sa* with occasional flourishes to higher *jiva svaras* depending on the *raga*. Rhetorically, this upper-register exploration represents the most intense section of the *kriti*; in accordance with Larson's (2012) musical "gravity," the high tessitura embodies the greatest amount of tension, a buzzing frenzy of stored "potential energy." Also, more so than in the *pallavi* or *charanam*, the literal *svara* of *sa* predominates the musical texture of the *anupallavi*. Most *anupallavis* center around the climactic gesture of an extremely long, sustained pure tone on *tara sa*, which I call the "money note."(23) The end of the *anupallavi* is almost always capped with a restatement of the *pallavi*, either in its original form as represented by its most intensified *sangati*. In either case, the *anupallavi* concludes by descending to *madhya sa*. Given the context within the overall arch-shaped form of the *kriti*, this return feels like a rhetorical recursive gesture, simultaneously recalling the thematic content of the *pallavi* and foreshadowing the inevitable structural return to *madhya sa* in the *charanam*. More imaginatively, the bookending *pallavi* verse retroactively contextualizes the *anupallavi* as an exponentially extended *sangati*, freed from its normal *tala* cycle constraints, frozen in time at the top of the basic structure's ambitus.

[48] The *charanam,* the closing section, is the most flexible and expansive of the formal sections of a *kriti*. Unlike the short verse + *sangati* structure of the *pallavi* and *anupallavi*, the *charanam* can contain any number of distinct verses, each of which may or may not feature *sangatis*. Performers may also intersperse the *charanam* with specific types of improvisation (discussed further in Section VI). With respect to the basic structure, its single voice-leading task is to complete the descent to *madhya sa*. However, between the recursive returns to *madhya sa* with each *sangati* of the *pallavi* and with the additional *pallavi* iteration closing the *anupallavi*, *madhya sa* has already been relentlessly foreshadowed throughout the *kriti*; perhaps in response, the *charanam* tends to be the most idiosyncratically and imaginatively structured.(24) Many *charanam* sections rhetorically counterbalance the ecstatic activity of the *anupallavi* with more measured, lyrical, reflective material; in addition, they tend to explore the *mandara sthayi*, the octave below *madhya sa*—the last unexplored reaches of the vocal range.

[49] **Example 21** contains a complete transcription and structural analysis of the Tyagaraja composition "Vidulaku

Mrokkeda," complete with *sangatis* as performed by Karaikudi S. Subramanian. The *pallavi* features the motivic device of the fourth descent as part of the initial prolongation of *madhya sa*, reinforced by a series of *sangatis* outlining the same *sa–ma* interval with increasingly dense *prayogas*. The *anupallavi* begins with yet another motivic fourth, this time in the form of a *pa–sa* ascent leading to the "money note" (marked in the transcription). The *charanam* is especially expansive, with a total length of eighteen *tala* cycles (as big as the *pallavi* and *anupallavi* combined, even with all their *sangatis* included). The *charanam* spends considerable time elaborating *madhya pa*, coupling with the piece's first (and only) descent down below *madhya sa* to *mandara pa*. From this nadir, the melody sweeps up to *tara sa* and back down to *madhya sa*, a final restatement of the basic structure that recapitulates the tonal progress of the whole composition before the final reiteration of the *pallavi*.

[50] One of the most striking compositional features of the *kriti* with respect to the basic structure is the degree to which its constituent parts encapsulate recursive, nested iterations of the basic structure (**Example 22**). In the context of the *kriti* as a whole, the *pallavi* completes the ascent from *madhya sa* to *tara sa*, but because of the cyclical declamation of *sangatis*, it itself concludes with a descent back to *madhya sa*. The *anupallavi* primarily prolongs *tara sa*, but it also concludes with an iteration of the *pallavi,* a complete statement of the basic structure in its own right. Finally, many *charanams* conclude with climactic, summarizing gestures, sweeping up and through the entire vocal range, recapitulating the basic structure in its entirety before again subsiding with a restatement of the *pallavi*. As shown earlier in Example 21, "Vidulaku Mrokkeda" gives a paradigmatic example of a basic structure in which each of the *pallavi*, *anupallavi*, and *charanam* each contain a complete nested iteration of the basic structure.

[51] The foregoing examples derive exclusively from the works of Tyagaraja, a composer with a reputation for being unusually transparent (even conspicuous) in his systematic presentation of compositional ideas (Janakiraman 2013; Krishna 2013). By a considerable margin, Tyagaraja boasts the loftiest reputation and most concert performances of any Karnatak composer, even when compared to Dikshitar and Sastri, the remaining two members of the compositional Trinity. Tyagaraja's preeminence within the tradition erodes the boundaries between his individual compositional style and Karnatak style in general; not only do his works permeate concert performances, but his output has also disproportionately influenced later composers to the point of imposing a standard compositional practice. For the purposes of the present study, my interest is tracing structural levels as they manifest in normative Karnatak practice, and focusing on Tyagaraja in particular faithfully attends to the standard procedures and expectations across a much wider swath of activity.

[52] That being said, while the basic structure discussed in this article is generalizable across Karnatak compositional practice in general, the nuances of its manifestation can vary in meaningful ways, especially in the hands of different composers. Tyagaraja's contemporaries—Muthuswamy Dikshitar, Syama Sastri, Swati Tirunal—boast personal styles with the greatest aesthetic variance from his compositional style. (They had the fortune of composing before his style calcified into normative practice.) T. M. Krishna explicitly differentiates between Tyagara's transparent, systematic approach and Muthuswamy Dikshitar's more subtle, rhapsodic approach:

> In most Tyagaraja [*kritis*], each line of the composition—though linked with each other—stand out as clear melodic statements. Muttusvami Dikshitar [sic] has not followed this melodic structuring. He has looked at the whole *kirtana* as one body of melodic movement. . . . The *raga* flows in a very unstructured manner. This is not to imply a lack of clarity, but . . . an absence of obvious divisions within melodic patterns. (Krishna 2013, 99).

[53] Krishna's account suggests that Dikshitar's compositions might not conform to the basic structure as readily as Tyagaraja's, but my analysis reveals that Dikshitar's output demonstrates comparable adherence to the basic structure at the background level. **Example 23** shows the *pallavi* and *anupallavi* of Dikshitar's composition "Anandesvarena" in Ananda Bhairavi *raga* (*Arohana*: S G2 R2 G2 M1 P D2 P S; *Avarohana*: S N2 D2 P M1 G2 R2 S), as transcribed from T. M. Krishna's own rendition.[(25)] Unlike most of Tyagaraja's compositions, the first line of the *pallavi* traverses an expansive range, starting on *pa*, ascending quickly up to *tara sa*, and then descending through the entire *avarohana* to rest on *madhya sa*. (The off-tonic opening is one of the more common variants of the basic structure, which I categorize as an "initial descent" in Example 3.) Once *madhya sa* is achieved, the composition initiates its background tracing of the basic structure, which—matched to the trademark lyricism of Dikshitar's melodic writing—unfurls gradually throughout the *pallavi* and *anupallavi*, only ascending to

structural *pa* by the end of the *pallavi*. (This *kriti* is generally performed without systematically ascending elaborative *sangatis*.) The first melodic cell of the *anupallavi* traces an entire 1̂–5̂–8̂ ascent, which, after elaborative *sangatis* surrounding the "money note" of *tara sa*, completes a nested basic structure with a descent to *madhya sa*. In a lovely detail, this *madhya sa* elides into a final restatement of the *pallavi*, retroactively supplying the "missing" *madhya sa* that the opening phrase of *pallavi* had omitted. (It also completes a smaller nested basic structure within the *anupallavi*'s nested basic structure, attached to the final *madhya sa*.) For Dikshitar, the basic structure informs a subtler but more tightly recursive approach to form than often seen in the compositions of Tyagaraja.

[54] In the twentieth century, Papanasam Sivan is perhaps the best example of a composer charting a path distinct from the strict Tyagaraja style. In his well-known *kriti* "Ka Va Va," in Varali *raga* (S R1 G1 M2 P D1 N3 S), Sivan renders the *pallavi* in the Tyagaraja style, demarcating a very clear *sangati*-based melodic ascent from *madhya sa* through *pa* to *tara sa* (**Example 24**). In the *anupallavi*, however, he very patiently resists the allure of *tara sa,* instead elaborating *madhya pa* for some time before finally supplying the expected "money note" and elaborative *prayogas*. This unusually long stress on *madhya pa* in the *anupallavi*, coupled with its relative lack of weight in the *pallavi*, leads me to hear the *anupallavi pa* as the structural *pa*, rather than the more typical *pallavi pa*.

[55] As the relative subtlety of these divergences from Tyagaraja's norm suggests, structural design in Karnatak composition displays remarkable consistency, even accounting for the stylistic peculiarities of different composers. To my ears, the variants I compiled in Example 3 represent superficial deviations from the prevalent 1̂–(5̂)–8̂–1̂ shape, with divergences keenly felt against the expectations of standard formal design.

VI. *Manodharma*

[56] Complementing the compositional canon, improvisation (or *manodharma*[26]) plays an enormous role in Karnatak musical performance practice. Improvisation appears in a small number of regimented forms, each of which is reserved for specific contexts within a performance. Perhaps the most important of these is *raga alapana* (or simply *alapana*), an unmetered, arrhythmic free improvisation. The *alapana* can stand on its own as a self-enclosed form, but it usually appears affixed to the beginning of each composition in a concert. Other improvisational forms include *tanam*, an unmetered but strictly rhythmic improvisational style using the syllables "ta" and "nam" (imitating the pluck of the *vina*)[27]; *niraval*, in which the performer renders a line of the composition's lyrics with complex melodic variations while maintaining its exact rhythmic profile (extemporized *sangatis*, essentially); and *kalpana-svara*, melodic improvisation sung on *svara* syllables. For the purposes of the present study, I will mostly confine my analysis to the improvisational form of *alapana*, "the principal vehicle of exploring a *raga's* identity" (Krishna 2013, 104).

[57] Karnatak musicians and scholars usually describe improvisation and composition as distinct but mutually dependent domains. For Janakiraman, improvisation represents a crucial countervailing force of "creativity" that balances out the more technical "recitation" of compositions, each artistically incomplete without the other (2013, 262). T. M. Krishna is more technical in his account of the co-determinate relationship between the two:

> Compositions give the musician the rubric of *raga* and *tala*. The musician then proceeds to internalize the composition, and in so doing, opens up newer *raga* and *tala* possibilities [for improvisation]. This process can, in turn, lead to fresh compositions that use these very expanded creations of the musical imagination. It is in this interaction that the musical possibilities of *raga* and *tala* evolve continuously. (2013, 104).

[58] These observations focus primarily on the foreground and middleground levels of *gamaka* (ornamentation) and *prayoga* (phrase). That is, learning compositions in a particular *raga* furnishes the practitioner with a lexicon of appropriate *raga lakshanas* that may be utilized in improvisation. The primary function of the *alapana* is expository; it is "the principal vehicle of exploring a *raga*'s identity *alapana* is the opening of a *raga* that brings forth all of its facets without the use of other elements, like *sahitya* [lyrics] or *tala* [meter]" (Krishna 2013, 104). This establishment of identity works in both positive and negative dimensions: the performer must demonstrate sufficient command of the *raga lakshanas* to satisfyingly cull forth its richness, while simultaneously making sure to select *prayogas* that differentiate it from other *ragas* with similar *svara* structure. The utter rhythmic and metric freedom of the *alapana* begs artistically demanding questions of the performer: what is one to

do? How does one structure the *alapana* so it does not devolve into aimless noodling?

[59] As it turns out, performers overwhelmingly tend to craft their *alapana* according to the outline of the $\hat{1}$–($\hat{5}$)–$\hat{8}$–$\hat{1}$ basic structure proposed in this article. There is significant precedent in Karnatak scholarship for structural level-analysis of *raga alapana*, much of which aligns very closely with my specific concept of the basic structure. In his magisterial six-volume study of South Indian music, P. Sambamoorthy explains: "The beauties of the *raga* are presented in a leisurely, detailed, and elaborate manner and in the several sections of the three octaves" (1964, [IV] 8); after all, "an *alapana* without a plan will be a mere jumble of musical phrases" (1964, [IV] 19). He divides a "well-planned" *alapana* into three main sections: (1) *A'kshiptika* ("introduction"), featuring motion from *madhya sa* to *tara sa*; (2) *Raga vardhani* ("body"), itself divisible into four sub-sections, exploring the middle and upper registers with increasingly virtuosic *prayogas*; and (3) *Sthayi* and *Makarini* ("conclusion"), winding down the tension with more subdued phrases (10). In his dissertation, T. Viswanathan offers a similar account of the build-up structure, specifying further that the narrative arc of the *alapana* will conclude with a final *tara sa-madhya sa* descent: "(a) Commencement of *alapana* to arrival at *tara sa*; (b) *Sancaras* [phrases] in the *tara sthayi* around and above *tara sa*; (c) *Brikka* (fast passages) in any range; (d) Trend toward conclusion, and conclusion" at *madhya sa* (1977, 57).

[60] In recent decades, scholars have gone into much more detail about the tendency of performers to structure their *alapana* performances around melodic elaborations of particular scale degrees arranged in a basic ascending-descending contour. Janakiraman writes, "So in the case of the treatment of the ragas either in *alapana* or in the compositions some notes may not be powerful *grahas* and *nyasa* [starting and ending pitches] but by all means the intermediary *grahas* and *nyasas* they also mark the terminals during the course of an elaborate alapana progressing stage by stage like the *Gandhara* region [pitch space surrounding *ga*], *Pancama* region [surrounding *pa*] etc. in a raga like Shankarabharana" (2013, 93). T. M. Krishna's account features even more explicit structural-level language:

> Every *alapana* begins with a phrase that clearly establishes the *raga's* identity . . . following this, if the *raga* has complete scope without any built-in aesthetic restrictions regarding its limits in the three octaves, the musician settles down at the *madhya sthayi sa*. Then, in an ascending step-by-step method, she proceeds to ascend the octave, stopping at *svaras* that are important to the *raga* and using them as long *svaras*. In this way, at every pause, she explores the musical space or "region" around the *svara* that is used as reference. As the musician reaches the *tara sthayi sa*, a certain momentum is built in the *alapana* . . . this is followed by a descent, which is much shorter than the build-up, usually concluding at the *madhya sthayi sa* or *pa*, depending on the *raga*. (2013, 111)

[61] In addition to outlining the basic structure across its entire form, the *raga alapana* also frequently features recursive iterations of the basic structure within smaller formal sections—another close homology to compositional procedures. Sambamoorthy observes that the introductory section (*a'kshiptika*, in his terminology) may make a return to low *sa* even after reaching the high point of its linear ascent. Thus, while serving as introduction for the whole *alapana*, the *a'kshiptika* also can be considered "a condensed *alapana*" all on its own, tucked within the complete structure (1964, [IV] 10). Similarly, the concluding *makarini* section may feature a final burst of *prayogas* running up and down the entire vocal range, a grand summarizing gesture reminiscent of *charanam* compositional procedures.

[62] Regarding the practical use of the ascent-descent shape, Viswanathan comments that "it is questionable as to whether or not musicians think of *alapana* in terms of such sections. Yet each of the thirty *alapanas* studied in this work conforms to the proposed four-section format, albeit with differences in proportion and sequence" (1977, 57). However, commentary by current practitioners suggests that musicians do indeed consciously approach the *alapana* in these very terms. Many performers, for example, colloquially refer to a "build-up" procedure in rendering *alapana*. A disciple of the legendary twentieth-century singer Semmangudi Srinivasa Iyer describes the master's approach to *alapana* as follows:

> When he commenced a *raga alapana* the first phrase would clearly indicate the ragaHe would compare a major *raga alapana* to building an edifice (*Gopuram*). He would say that the *raga* should be built up from the base and rise up to the top, with ornamentations at every level." (V. Subramanyam 2014)

[63] Aruna Sairam, a prominent contemporary vocalist, describes her impression of improvisational and compositional form

in an interview published in a recent issue of *Sruti* magazine:[(28)]

> We start by building up the *raga* phrase by phrase from the *adhava shadja* (low *sa*) upwards and follow a certain architectural map, so to say, when developing the *raga*. . . . the same thing applies to a *kriti*." (Sairam, Mudgal, and Bhavalkar 2012, 34)

[64] **Example 25** shows an *alapana* in Bhairavi *raga* rendered by the great contemporary vocalist Bombay Jayashree. She begins the *alapana* with Bhairavi-specific *prayogas*, clearly establishing the *raga's* identity and evoking the characteristic affect of the *raga* before settling into *madhya sa* in phrase 4. After elaborating *madhya sa*, Jayashree ascends methodically through the *madhya sthayi*, elaborating *madhya pa* in phrase 8 and *tara sa* in phrase 11, which she prolongs with a "money note" followed by a flurry of rapid passagework. Beyond the *sa–pa–sa* basic structure, Jayshashree emphasizes the *jiva svara* of *ri* throughout, but even in this emphasis she highlights its subservient relation to the structural fifth. In phrases 2–3 and 23, *ri* is treated as an upper neighbor to the stronger structural *sa* in phrases 4 and 24; in phrases 7 and 18, *ri* bisects couplings between *mandara pa* and *madhya pa*, outlining nested 1̂–5̂–8̂ structures prolonging *pa* both in ascent and descent. Jayashree's build-up structure is strikingly symmetrical; as I demonstrate in my analysis, these nested 1̂–5̂–8̂s and upper-neighbor *ri* phrases each appear twice, reflecting at the fulcrum of *tara sa* in phrase 11.

[65] While enjoying much less scholarly attention than *alapana*, the structuring of *tanam* also adheres quite closely to the outline of the basic structure. Typical *tanam* textures feature a flurry of motivically linked, rhythmicized *prayogas* gravitating around particular *svaras*, which are generally organized in a systematic, ascent-descent form. The opening pitch center is usually *madhya sa*, depending on the *raga*, which is then followed by *madhya pa*, *tara sa*, and perhaps some intermediary *jiva svaras* if time and scope permit. **Audio Example 2** is an excerpt of the "ascent" portion of a long *tanam* performed in Thodi *raga* (S R1 G2 M1 P D1 N2 S, comparable to the Western Phrygian mode) by *vina* virtuoso Ranganayaki Rajagopalan. In her performance, she very transparently structures her improvisational form using a "build-up" strategy, with clusters of *prayogas* elaborating *madhya sa*, *madhya pa*, and *tara sa* in succession.

[66] Though the build-up structure remains consistent across *manodharma* practice, "there is no traditional rule or standard to determine the relative length of each of these sections," (Viswanathan 1977, 57); "every section has its own form with inbuilt flexibility in terms of how a musician chooses to build on every important phrase in the *raga*" (Krishna 2013, 111). The intensity of the elaborative process depends primarily on the scope of the particular rendering, which varies considerably depending on the performance context. Typically, Karnatak concert programs are very meticulously paced. One or two compositions will be rendered expansively (often upwards of thirty or more minutes in length), with extensive *sangatis* and several varieties of improvisation interspersed. These will generally be flanked on either side by compositions rendered with relatively compact scope (five to ten minutes in length), usually featuring fewer *sangatis* and little or no improvisation within the compositional form. *Raga alapana* is expected to introduce the *raga* before each new composition as a matter of course, and performers scale the elaborateness of the *alapana* accordingly with the scope of the composition interpretation. Thus, a complete *raga alapana* can range from just a few decisive *prayogas* for a very short composition to over fifteen minutes in length for a concert centerpiece (and even considerably longer if featured as a self-enclosed form or as part of a *Ragam-Tanam-Pallavi*).

[67] No matter the length, the basic structure holds intact across all varieties of *alapana*, expanding and contracting with the scope of execution. Shorter *alapanas* require the performer to be much more condensed in their organization, with little time for elaborating each step, while longer *alapanas* encourage significant development and elaboration at every stage. T. Viswanathan closely compares two *alapanas* rendered by the singer M. L. Vasanthakumari in Thodi *raga*, one 2'40" in length and the other 10'10" in length, with commentary cataloguing their progress along a tonal trajectory very similar to my conception of the basic structure. Both *alapanas* traverse identical tonal territory, with the main difference being the increased number and variety of elaborative phrases in the longer rendering at each successive stage in the structure (Viswanathan 1977, 67–70).

[68] **Example 26** and **Example 27** compare two *raga alapanas* in Varali *raga* by T. M. Krishna side by side. The shorter *alapana* is just fifteen seconds in length, consisting of three quick phrases. Nonetheless, even with such limited scope, Krishna carefully selects *prayogas* that outline the basic structure. The improvisation begins by ascending from the *mandara sthayi*,

rapidly decorating the structural *svaras* of *madhya sa*, *madhya pa*, and *tara sa* before descending back down to *madhya sa*. While in most performances the primary accompanying instrumentalist (usually a violinist) will follow the vocalist's *alapana* with an *alapana* of her own, this particular rendition is so short that the beginning of the *kriti* immediately follows. After reaching *madhya sa*, Krishna adds a parenthetical *prayoga* ending on *ri*, artfully eliding the end of the *alapana* with the *ga* that begins the *pallavi*.

[69] The longer *alapana*, by contrast, spans over six minutes in length and encompasses sixty-three phrases in total. Again, Krishna very clearly outlines the basic structure, but given the expansive scope, he methodically elaborates each of the structural tones of *madhya sa*, *madhya pa*, and *tara sa* with anywhere from ten to twenty-five (!) phrases. Many of these elaborations feature motivically developmental treatment of certain *prayogas* across successively longer phrases.[(29)] For just one example among many, in Example 26, phrase 9 (which encircles the local target of *pa*) is repeated verbatim at the start of phrase 10, where Krishna sequences it and elaborates its cadential gesture, and phrase 11, where he elaborates its contours with more virtuosic *gamaka* figurations (or *brikka*). A fast ascending passage then begins phrase 12, transforming the *brikka* flourishes into motivic material: phrases 13 and 14 develop this gesture in much the same way that phrases 10 and 11 develop phrase 9. The longer form also enables Krishna to build in nested iterations of the basic structure. Phrases 1–14 enclose an initial establishment of *madhya sa*, an ascent through *madhya pa* (phrase 9) to *tara sa* (12), and a descent back to *madhya sa* (14). In the context of the whole *alapana*, this "mini-*alapana*" represents an elaboration of the initial *madhya sa*; the structural *madhya pa* is clearly saved for phrase 15. Note too that Krishna, with his famously monstrous vocal range, elaborates *prayogas* around *tara pa* and well below *madhya pa*, expanding the range of typical basic structure.[(30)]

[70] Viswanathan identifies the following five devices for expanding *raga alapana* while maintaining fidelity to the "build-up" form, all of which are readily on display in **Example 27**: "(a) Extending the range in both *mandra* and *tara sthayis*; (b) Optimum use of contrasting tempi; (c) Emphasizing each successive *svara* from *madhya ga* to *tara ma*, taking plenty of time to develop each; (d) Motif [sic] development, using material at both beginnings and ends of phrases; (e) Frequent interpolation of *brikka* passages" (1977, 70). Two important points leap out here. First, Viswanathan explicitly describes the practice of organizing phrases around particular structural *svaras* as "emphasis" and "development"—one of the most direct statements approaching the concept of structural levels I have found in the Karnatak theoretical literature. Second, given the amount of time the performer has to improvise in the longer form, often each successive scale tone gets emphasized as part of the ascent. This particular point highlights a latent tension between formal architecture and maintaining fidelity to the *raga lakshanas*. The ascent-descent basic structure lends structural strength and stylistic consistency across all *raga alapana* performances, but potentially at the expense of emphasizing the hierarchical peculiarities suggested by the *raga's* particular *prayogas* and *jiva svaras*.

[71] T. M. Krishna, though himself one of the most skilled architects of the build-up form among current performers (as evident in **Example 27**), attributes its ubiquity more to convenience than aesthetic ideology:

> The primary problem is that adopting a linear ascending approach to *alapana* exploration affects the aesthetic content of the *raga*, because the phrases have not evolved with the scale of the *raga* in mind. This also leads to a certain distortion in the *raga* identity. But a level of standardization has, over time, come to be adopted in the *alapana* format, whereby most musicians take recourse to the step-by-step approach to *raga alapana* for almost all *ragas* . . . leading to the loss of many important phrases. They use unnecessary stresses on regions and *svaras* that are of no relevance to the *raga*, leading to a loss of aesthetic identity. (Krishna 2013, 114)

[72] Krishna suggests that Karnatak *manodharma* has been influenced too greatly by generalizable "musical forces"—musical "gravity," "magnetism" to nearby structural tones, pattern "inertia"—and the simple *gestalt* of step-wise motion (pers. comm.). What would an alternative look like? Krishna's ideal *raga alapana* features a more instinctive, phrase-based approach, with no overarching melodic structure unduly influencing the choice of *prayogas*. Musical interest arises purely through intimate connection with the aesthetic flow of the *raga*—spinning phrases out "like strokes on a canvas" (2013, 113). For a musician of Krishna's skill, a system built on taste and instinct alone could yield rich results, but students and artists of lesser imagination might chafe at the lack of structure.

[73] Though Krishna's position on the aesthetic value of the build-up structure represents a significant outlier to mainstream

thought, it highlights crucial issues regarding the interplay between Karnatak theory and practice. His voice of discontent reminds us that normativity can and should be dissociated from values—frequency is often an indicator of quality, but it can also conversely be an indicator or inertia, convenience, or lack of creativity. Krishna's stance echoes Schoenberg in challenging us to constantly submit our theoretical principles and musical practices to withering scrutiny, a crucial test of the strength of our aesthetic precepts. Far bigger than any one individual's voice, a musical tradition is a veritable ocean comprised of the collective energies of generations of performers, audiences, thinkers, and critics. The ubiquity of the basic structure across the varying domains of Karnatak music, rather than necessarily reflecting unanimity of musical values, above all reflects a striking transferability and commensurability between the various facets of Karnatak musical practice. Given the immersive training and performance regimen of great performers in the Karnatak tradition, cross-pollination between these various domains not only seems understandable, but inevitable.

XIII. Concluding Thoughts

[74] In the present study, I have proposed a theory of structural levels in Karnatak music. To summarize: we can parse musical activity into the foreground level of *gamaka*, the two middleground levels of *svara* and *prayoga*, and a background level of long-range voice leading. The background level outlines a strikingly consistent basic structure that undergirds compositions, improvisations, and theoretical structures (such as the *arohana-avarohana* representation of *raga* scales) alike.

[75] While the theory of structural levels applies consistently across Karnatak musical practice in general, the scope of this particular article restricted the purview of my arguments to paradigmatic examples. Most of my compositional examples come from Tyagaraja, and specifically from the form of the *kriti*; most of my discussion of improvisation concerned itself with *raga alapana* in particular. While the outsized importance of each of these areas of focus means that they are central enough to the tradition that they can effectively stand for it as a whole, nonetheless they do not represent the full variety of Karnatak musical expression. I believe that future work refining the general principles demonstrated here in the context of specific composers, compositional forms, and improvisational styles would very valuably enrich the results of the present study.

[76] The theory of structural levels was inspired first and foremost by my direct interaction with Karnatak music on its own terms, stemming from my experiences as audience member and performer as well as my interaction with the theoretical literature. The transferability of many of the concepts in this study (and the specific details of Karnatak musical practice, for that matter) to those in other musical traditions, especially the art-music traditions of the West, are not lost on me; the potential for valuable cross-cultural projects, both scholarly and creative, has barely yet been tapped. At the very least, I hope that this study will make Western music and Karnatak music significantly more accessible and resonant to their respective practitioners, and that the ideas presented here will encourage future imaginative and creative endeavors in both domains.

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Footnotes

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1. For further reading on the rhythmic language of Karnatak music, I strongly recommend Nelson 2008 and Wolf 2010.
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2. In practice, *gamaka* and *svara* form more of a dynamic equilibrium than a consistent hierarchy; I discuss this point at more length in Section IV.
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3. Karnatak music is much less well-known to Westerners than its much more inclusive and evangelistic cousin to the north. Thanks in large part to the pioneering efforts of such artists as the Beatles and Ravi Shankar, Hindustani music has been ingrained in the landscape of Western popular culture since the mid-twentieth century.
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4. The use of a key signature can de-emphasize the peculiarities of the mode, especially with *ragas* whose scales do not conform to the diatonic patterns of whole and half steps that Western staff notation reflects by design. In my notation, accidentals appear before every note that they alter, with the exception of (a) repeated notes—an accidental placed on the first note will apply to all subsequent repeated notes; and (b) oscillations—an accidental placed on the first note will apply to all subsequent iterations of the same note within an oscillation. Courtesy accidentals (i.e. visually clarifying augmented intervals) are occasionally added at my discretion. For purposes of visual clarity, oscillations to microtonal targets are denoted with a wavy line as opposed to microtonal accidentals.
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5. This consistency is practical: not only does it ensure that the entire program will fit as comfortably as possible within a vocalist's range, but it also allows instrumentalists to tune their instruments to the vocalist's preferred *sruti* and avoid significant retuning during the concert.
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6. Classical Indian music theory dictates a 22-tone division of the octave, yielding irregularly sized whole steps and half steps between the *svaras*. In practice, however, vocalists and instrumentalists tune *svaras* more closely to just intervals over the fundamental *sruti*, as evidenced by the placement of frets along the fretboard of the *vina*. The relevance of the 22-tone system in Karnatak music is often overemphasized in the West because of its exoticism and its overrepresentation in Karnatak theoretical treatises compared to more practical concerns of execution. In truth, the Karnatak use of microtones is not always so different than certain standard performance practices in Western music; for example, certain varieties of the *gamaka* called "*kampita*" (an oscillation) are practically identical in execution to vibrato in a Western context.
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7. "UT queant laxis REsonare fibris
MIra gestorum FAmuli tuorum
SOLve pollute LAbii reatum
Sancte Ioannes."
(traditionally attributed to Paulus Diaconus, 8th century)
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8. It is unclear whether or not these images refer to the *svaras* in the abstract or the interval sounded when moving from *sa* to that particular *svara*.
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9. The *melakarta* scheme was first introduced by Venkatamakhi in his treatise *Caturdandi Prakasika* (c. 1620).
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10. A short digression on *raga*: the concept of *raga* is surprisingly resonant with musical practices around the world, including many styles of Western music. For one, the strictures of *raga* strongly resemble theories of "melody type" in Gregorian chant; namely, defining the church modes "not as abstract scale formations determined by final, ambitus, and possibly pitch of emphasis, but as categories characterized by a number of standard formulae or motives recurring in the melodies of that mode" (Apel 1958, 136). As Willi Apel points out, this would connect the *raga* not only with chant but with a number of other modal traditions around the world, such as the Byzantine *echoi*, the Syrian *risqolo*, the Javanese *patet*, and the near-Eastern *maqam* (136). We can only speculate on whether or not chant and other modal traditions featured similarly rich systems of ornamentation; as Powers argues, when medieval treatises on church modes began to focus "only on ambitus and scale-structure," "the monodic art itself declined and disappeared" (1958b, 457). Even in the polyphonic Western music of more recent centuries, particular composers, styles, and epochs will demonstrate consistent approaches to dissonance treatment, ornamentation, and phraseology that involve recurring schematic patterns of pitch and rhythm. (For one evocative example, see Gjerdingen 2007, passim.) *Ragas* differ from these analogues not so much in kind but by degree: that is, by the rigidity of their codification and the clarity of their definition.
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11. It is not clear whether performers that keep the *sa-pa-sa* drone in these cases do so out of a desire to intentionally create tension against the *raga* or out of inertia.
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12. In Indian theory, such mental mode-shifting is referred to as *murchana*.
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13. In practice, *gamaka* execution will vary subtly depending on the particular performing lineage or instrumentation. Some *gamakas* are universally rendered across all Karnatak music performance, while others are specific to the technical peculiarities of particular instruments; some are "borrowed" between vocal and instrumental techniques; and still more change from *raga* to *raga* depending on the interpreter. For example, the Karaikudi *vina* tradition (of which Karaikudi S. Subramanian is the current exponent, representing its ninth generation) strenuously works to overcome the limitations of the fretted instrument by imitating the *gamakas* typical of vocal performance. Its practitioners' style is unusually florid, with considerably more pulling (bending the string with the left hand to displace the pitch) and less reliance on fingerboard techniques like hammering-on and pulling-off than in other styles. In turn, vocalists often absorb *gamaka* based on instrumental techniques; the *sphurita*, for example, originates from the specific "hammer-on" technique on the *vina*.
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14. The majority of the examples in this section draw from Mayamalavagowla *raga*, with the primary motivation being the observation that a deeper acquaintance with (and appreciation for) the richness of one particular *raga* will be more instructive than a cursory overview of many.
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15. It is worth mentioning that the *gamaka* in Mayamalavagowla quite directly mirror the isomorphic tetrachords of S-R1-G3-M1 and P-D1-N3-S. Not only does this further corroborate the sense of "consistency" in *gamaka* treatment of particular divisions of pitch space, but it also helps to explain the secondary structural weight given to *ma* in Mayamalavagowla in particular; its inverted fifth-relation to *sa* is explicitly analogized by the *pa-sa* ascent.
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16. This particular *gamaka*, enharmonic to a D–E♭ oscillation in a Western C-based mode, can represent different *svaras* in different *ragas* depending on the surrounding tonal context. In Thodi (S R1 G2 M1 P D1 N2 S), comparable to the Western Phrygian mode), G2 oscillates *downward* into the equivalent of G1; in Bhairavi (scale structure discussed earlier), R2 oscillates upwards into G1 to create the identical sound. The convergent musical phenotype of *gamakas* representing different *svaras* lends Karnatak *raga* more aesthetic consistency than the overwhelming combinatorial possibilities of the *melakarta* system

would seemingly indicate.
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17. I experienced this phenomenon firsthand many times during my *vina* studies with Karaikudi S. Subramanian. He taught me pieces by playing one phrase at a time, making me repeat it back to him by ear until I could faithfully reproduce its every nuance. In those cases where I simply could not get the exact details to his satisfaction, he would sometimes deign to play or sing the underlying *svaras*, which often resolved an issue of timing or emphasis I hadn't been able to see before. I would sometimes present him with my own transcriptions at the *svara*-level, which he would make corrections to if he felt I was slightly misrepresenting a *gamaka*, but in many cases he accepted my interpretations as valid even when they differed from his own.
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18. Correspondingly, simple evenly spaced patterns at the *svara* level can manifest as densely syncopated rhythms at the *gamaka* level. While rhythmic concerns are beyond the purview of the current study, their centrality to the Karnatak aesthetic should not be overlooked.
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19. This three-part structure is overwhelmingly normative, but variations do exist. Of the three main sections, only the *pallavi* is immutable. Some *kritis* omit either the *anupallavi* or *charanam*, and others may feature two or more *charanams* (Krishna 2013, 95–100).
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20. *Sangatis* may not necessarily be attributable to the composer of a *kriti*; they are often added by disciples and performers, and over time they become woven into the fabric of a composition (Krishna 2013, 98). Thus, many compositions as they are performed today actually represent composite fabrics of indefinite source; in many cases, the same composition will differ wildly between performers from different traditions. For a more detailed account of *sangatis* and variation processes in *kritis*, see Morris 2001.
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21. In this way, the *pallavi* phrase itself can be thought of as a summarizing "snapshot" of the entire *kriti*.
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22. A note on transcribing compositions in Karnatak music: though many canonical compositions are performed ubiquitously, the finer details of their execution can vary significantly from performer to performer, in large part due to the culture of oral transmission and the discrepancies between varying styles and/or pedagogical lineages. (Each performer's unique interpretation remains relatively fixed across performances.) No "standard" version of the composition exists at the *gamaka* level or even the *svara* level, although the lyrics, *raga* and *tala* setting, and rough melodic outline will generally persist from performer to performer. Thus, no single "composition" exists; a transcription always reflects the interpretation of a particular performer or style. Compounding this is the hermeneutical challenge of parsing *gamaka* into *svara*, and vice versa; given the isomorphisms between *gamakas* and *svara-prayogas* at different speeds, any composition can be accurately represented with many different equally valid notational interpretations.

My transcriptions of compositions take a single recorded performance as their basis. I include renderings of each *sangati*, as these are integral to the voice leading at background level and moreover are most indicative of performance practice. For the sake of clarity and simplicity, in some cases I normalized some discrepancies. I used repeat signs to represent a deliberate reiteration of a particular passage and/or *sangati*; even if the performer extemporized some very slight embellishments from repeat to repeat, I felt that it was more important to communicate the structure and emphasize when new *sangatis* arrive. Thus, occasionally I omitted very minute variations between repetitive cycles. In cases where a particular detail appears differently in two repetitions, I chose the one I deemed "more essential," a judgment call based on my knowledge of the piece and the *raga*. (Most of these pieces I have been taught to sing and play on the *vina* by Karaikudi S. Subramanian, my *guru*; those that I have not, I have discussed with the performers.) In the (very rare) instances where the performer makes what I judge to be an error with respect to the intended pitch, rhythm, or structure, I correct it in order to represent the

composition "as intended."
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23. I have not found any specific terminology in the theoretical literature for this climactic *tara sa*, but it is omnipresent in compositions and improvisations alike and will be familiar to any practitioner of Karnatak music. It is a testament to the ingenuity and imagination of the great Karnatak composers that their compositions remain interesting despite sharing a very similar, predictable climactic gesture.
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24. The *charanam* will often include the signature of the composer in its lyrics, either an explicit reference to their name or a reference to a particular pseudonym—for example, the moniker "Guruguha" appears in most of Muthuswamy Dikshitar's *charanam* sections. This detail supports the notion of the *charanam* as the locus for least formal restriction, and thus the greatest freedom for a composer to show off their ingenuity and imagination.
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25. Muthuswamy Dikshitar is especially revered for the cleverness of his lyrics, which often subtly refer to the *raga* identity and melodic content. The title of the composition, "Anandesvarena," features an assonance with the "(-)ananda" syllables from the *raga* Ananda Bhairavi: no mere accident, for the first line of every successive phrase also includes these same syllables nestled in the first word.
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26. From the Sanskrit, "one's own will (*mano*) on the righteous path (*dharma*)" (Krishna 2013, 103).
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27. The compositional form "*Ragam-Tanam-Pallavi*" acts as a concert showpiece for artists to demonstrate their skill in *manodharma*, featuring a lengthy *raga alapana* section and *tanam* section before reaching the composed material, which consists only of a lengthy *pallavi* section.
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28. This is one of the only published accounts I have seen that draws such a direct parallel between the "build-up" *alapana* form and standard compositional design.
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29. This elaboration procedure fluidly merges the seemingly opposed poles of "formulaic" and "motivic" approaches to improvisation. On the one hand, performers draw from a finite set of memorized permissible *prayogas* to construct their phrases; on the other hand, the rhetoric with which performers develop material from phrase to phrases treats these *prayogas* as modular motivic cells.
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30. The standard form of the basic structure aligns closely with most performers' vocal or instrumental range; performers like T. M. Krishna that can reach higher or lower will often extend the developmental principles discussed earlier to create prolongational zones above and/or below the usual extremes. I summarize this possibility in the "expanded" basic structure variant offered in Example 3.
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