International Research Journal of Human Resource and Social Sciences
ISSN(O): (2349-4085) ISSN(P): (2394-4218)
Impact Factor 6.924 Volume 9, Issue 12, December 2022
Website- www.aarf.asia, Email : editoraarf@gmail.com

WESTERN VOCAL PRACTICES MAY HELP CARNATIC ARTISTS HAVE A BETTER SINGING VOICE

ADTIYA SHARMA
Research Scholar, Sunrise University, Alwar Rajasthan
DR. RAJKUMAR SHARMA
Research Supervisor, Sunrise University, Alwar Rajasthan

ABSTRACT

In this study, we provide a categorical ontology of Carnatic music. This has a dual purpose. As a first step, we'll use the framework of Carnatic music to show how powerful and adaptable conceptual modeling tools grounded in the mathematical field of category theory (CT) may be. In spite of this, automated music indexing requires clever processing and representation of the music signal. Indian music includes both musical aspects like Raga and Tala and non-musical ones like Singer, Instrument, Genre, and Emotion. Each of these parts may serve as a key value in a music information retrieval (MIR) system, allowing for fully automated indexing and retrieval of musical data. In this thesis, I propose a method for music signal processing that takes use of Carnatic music's distinctive qualities. In order to intelligently process the music signal and understand the content of a given musical piece from the first two minutes of the song, which may contain an alaap followed by pallavi or the pallavi alone, a combination of signal processing techniques with Carnatic music specific characteristics is used (Pallavi and Alaap are discussed later).

KEYWORDSCarnatic Music**,** musicians, Western Vocal Technique, music information retrieval

INTRODUCTION

Samaveda is the ancestor of Carnatic music. Later on, Purandaradasa standardized a curriculum of exercise instruction. Then the Trinities era emerged as the pinnacle of carnatic music's history. Several people, including musicians, musicologists, and authors, have helped carnatic music develop into the complex and original musical tradition that it is today. As a matter of fact, in ancient India, classical music was offered up as a sacrifice to the gods. It wasn't designed to amuse a wide audience. As a result, the emphasis shifted from musical beauty to the expression of religious fervor via performance. A musician's primary motivation is never to please an audience, but rather to discover who they really are via their art. Yet, as time went on, artists began considering the tastes of their listeners. The way a concert is presented now is a clear indication of this shift from times past. A lot of shows are ending earlier than they used to. The most well-

known works are included. Lighter and semi-classical compositions may now be heard with more frequency than in the past. As a part of this, studies are being undertaken in hitherto unexplored areas of music, and terminology like "voice culture" are becoming more commonplace.

Mankind has spent a lot of time and energy over the years trying to figure out the anatomy of the human body. Scientists' discoveries regarding the lungs, trachea, and associated muscular components prompted singers and their instructors to delve more into the phenomenon of singing. The phrase "passagio" was most likely coined by him. described his preferred name for vibration, tremoly. He recommended that vocalists do exercises on all of the vowels to ensure a consistent tone throughout their whole vocal range. Throughout the Middle Ages, the concept of vocal registers was discussed, although opinions varied. There were rumors of two or three possibilities. There is debate on how to teach a falsetto voice, and this debate may be traced back throughout vocal pedagogy's history. By the 15th century, the Renaissance had arrived, and with it came a flowering of musical expression. To "give the greater spirit to the growing and dimiinishing of the voice," as Duey paraphrases Caccini (1545-1618), "a man must have a mastery of breath." Many musical subgenres and subgenre-breaking styles emerged as time went on. Pop, jazz, rock, metal, etc., all need different vocal skills than those taught for opera. Because of this, several artists and vocal instructors throughout the world have created vocal methods that work well with the genres of today.

LITERATURE REVIEW

Pranathi Diwakar (2022) Even in the faceless concrete jungle of a contemporary Indian metropolis, caste prejudice is alive and well. Because of this, scholars interested in caste in contemporary India's urban centers must focus on the subtle but crucial symbolic processes through which caste is made manifest and maintains its relevance to social actors. In music, these differences are fought over, marked, or rejected on a symbolic level. In this research, I explore the caste features of the Carnatic and Gaana live music scenes in Chennai, a city in southern India, to better understand how caste distinction is socially maintained. Over the course of eleven months, I conducted 103 in-depth interviews and conducted hundreds of participant observations with musicians, patrons, sponsors, brokers, producers, technicians, dancers, and fans to better understand the dynamics at play in the city's contestations over contemporary meanings of caste. In this paper, I examine the ways in which digitalization, migration, and globalization contribute to the social reproduction of caste and conclude that these four mechanisms are responsible for the maintenance of caste in contemporary societies. I use this framework to move from the level of the individual, where I investigate how musical socialization contributes to the formation of a caste habitus, to the level of the city, where I consider how urban segregation is reinforced by the imprinting of caste on social groups through stereotypes and territorial identities. Next, I explain how the two contrasting caste-based social and geographical contexts each mobilize unique political beliefs and ultimately determine political behavior. Next, I describe how recording and digital technologies, the migration of caste diasporas, and the participation of these two forms in international circuits of taste have all contributed to the trans nationalization of caste. In this paper, I argue that caste takes on new significance in the metropolitan centers of India today. This study of "musicking" sheds light on the ways in which caste boundaries are both reinforced as Brahminism takes on a hegemonic register and also resisted by an anti-caste aesthetic that recovers marginalized histories of arts associated with Dalit communities in order to reimagine

radically different and more equitable futures. This research adds to our knowledge of the interplay between the politics of caste, city, and culture and issues of social difference, inequality, urban segregation, distinction making, and social movements.

Cristiane Magacho-Coelho et.al (2022) The purpose of this study is to examine the preliminary link between dermatoglyphic and sonic data of lyrical and pop vocalists, and to find genetically increased physical qualities (speed, strength, endurance, and motor coordination). The study's methods were reviewed and sanctioned by the institution's Ethics and Research Committee. Two lyricists and two pop vocalists, ages 31 to 53, were rated. Data was collected using the following methods: (1) an online survey asking singers to rate their own vocal habits, performance, and phenotype; (2) digitalization of fingerprint images to determine the singer's dermatoglyphic profile based on the singer's predominant fingerprint pattern (Arch, Loop, Whorl); delta scores (D10); the Total Ridge Count (TRC); digital formula and dermatoglyphic profile (aerobic, anaerobic, and mix); and (3) an expression analyzer to Correlations were discovered between auditory parameters (median, asymmetry, symmetry, mean, and standard deviation), and dermatoglyphic variables (Arch, Loop, Whorl, D10, TRC). There was no clear-cut separation of singing styles based on dermatoglyphics. As a result, f0 and LTAS measurements, in particular, seem to correlate with dermatoglyphic profiles. Topics Covered Include: Language, Phonetics, Dermatoglyphics, Speech Acoustics, and Voice Quality

Rupert Avis et.al (2019) Bi-musical education at KM Music Conservatory is discussed from the perspectives of both students and faculty (KM). In 2008, the Oscar-winning film composer A. R. Rahman founded a university in Chennai, India, called KM. As part of its globally recognized Bachelor of Music degree, the Conservatory provides a Diploma study accredited by Middlesex University, UK. In what has been called a "bi-musical" curriculum, students in the diploma program study both Western art music and Hindustani classical music in addition to audio engineering. Bi-musical education may perpetuate colonial, Orientalist, and neoliberal ideologies, as shown by teacher and student experiences with KM's curriculum. As an outcome of bi-musical education, I believe this should be acknowledged; however, I also believe that by acknowledging the generation of these discourses, bi-musical education can bring into dialogue a wide variety of issues that can be used to confront and unsettle colonial ideology, Orientalism, and neoliberalism in active ways.

Jeong Min Lee et.al (2018) The purpose of this study was to systematically investigate the data connecting the emergence of vocal nodules in children to certain characteristics and psychological aspects, as well as specific behavioral inclinations. The methods included a search of four electronic databases (PubMed, Scopus, ScienceDirect, and EBSCO Host) and the reference lists of relevant papers (both print and online). In the end, eight case-control studies satisfied the criteria for inclusion after being screened for relevance. Two raters independently assessed the quality of each research using a customized version of a standard checklist. We found that four studies had "excellent quality," while the other four had "fair" quality. Results relating personality dispositions (and accompanying behavioral proclivities) to vocal nodule development in children were inconsistent because the questionnaires used to evaluate personality or psychological characteristics differed substantially across research. The results show that extraversion and impulsivity (and their associated behavioral tendencies) may play a role in predisposing children

to vocal nodules and hence need additional study. Implications for clinical practice, the scope of this review, and areas for further study are all addressed.

Himanshu Kumar Sanju et.al (2016) Background Some kind of neuroplasticity must be at work in a musician's capacity to generate a precise pitch, enabling them to regulate fundamental frequency, sustain a desired pitch, and precisely control pitch through perceptual auditory feedback. To examine neuroplasticity, the current research compared the latency of P1, N1, and N2 as well as the peak-to-peak amplitudes of P1-N1, N1-P2, and P2-N2 in two groups of subjects: Carnatic vocal performers and non-musicians. Substances and Procedures There were two sets of healthy-hearing young women, ages 18 to 25. There were 20 vocalists trained in Carnatic music (southern India's classical tradition) and 20 others who weren't musicians. Stimuli were presented in the form of pure tones. Results Descriptive statistics showed that Carnatic vocal singers had reduced latency and higher peak-to-peak amplitude for all measurements compared to non-musicians. Vocalists were shown to have superior (lower) N1, P2, and N2 latencies and larger (higher) P1-N1 peak-to-peak amplitudes, as determined by repeated-measures analysis of variance. Conclusions In this research, CAEP parameters were considerably higher among Carnatic vocal singers than in non-musicians. This demonstrates that listening to music influences the brain's auditory center, and CAEPs may be used to examine this sort of neuroplasticity.

INTRODUCTION TO CARNATIC MUSIC

Indian classical music is one of the world's oldest musical traditions. It has been evolved through ages, has been influenced by numerous faiths and nations. The modern structure of Indian music is founded on two pillars: 1) raga ¯ and 2) tala ¯ . The first, raga ¯ , is the melodic component of the song, equivalent to the "mode" or "scale" in Western classical music. The tala ¯ , by contrast, defines the rhythmic component of a music. Indian classical music has two traditions, Carnatic and Hindustani, connected with southern and northern India, respectively. Though both traditions involve the concepts of

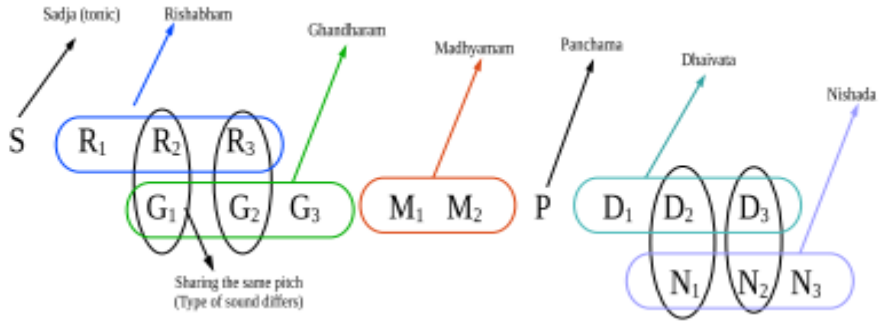

Fig. 1. Basic svaras that make up a melody in Carnatic music tradition

In terms of raga and tala, two fundamental musical concepts, the two traditions have different meanings of these terms due to their distinctive performance techniques. For the sake of this article, we will only be discussing music from the Carnatic tradition, and will save a discussion of Hindustani music for a later date.

A svara, approximately equivalent to a note in western music, is the most fundamental element in Carnatic music. The connection between svara and pitch, however, is more nuanced in Indian music than in Western music. Furthermore, the manner a note is spoken or played is determined by its svara. Sadja (S), Rishaba (R), Ghandhara (G), Madhyama (M), Panchama (P), Daivatha (D), and Nishada (N) are the basic svaras in Carnatic music (N). As the Sadja (first note) serves as the tonic, all subsequent svaras (notes) are evaluated in relation to its pitch1 (as illustrated in Fig. 1). This means that the Panchama svara frequency is always 1.5 times that of the Sadja.

The remaining svaras (R, G, M, D, and N) may each appear in two or three different forms, though. The frequency ratio of Rishaba, for instance, might be (16/15), (9/8), or (6/5). These shifts are designated by the letters R1, R2, and R3, respectively. Also, a number of svaras may have the same pitch frequency: The relative pitch frequency of G2 is similarly 6/5. There are a total of 16 svaras, with 12 different pitch ranges (svarastanas). S and P are examples of shudhsvaras since they are always the same.

The scenario is analogous to that of Western classical music, where the notes E and B are considered pure since they cannot be altered by the use of sharp or flat notation, whereas the notes C, D, F, G, and A are open to such manipulation. The seven notes of the C major scale (C, D, E, F, G, A, and B) correspond to the svaras S, R, G, M, P, D, and N when the S svara in Carnatic music is set to C major in Western classical music.

The pitch ratios for each svara are shown in Table I. The 12 svarastanas and their frequency ratios to the tonic are discussed in detail at. Several svaras have the same relative pitch, yet they are differentiated from one another by articulation. You can see this in Fig. 1, where the svaras are organized both vertically (by pitch) and horizontally (by articulation) (horizontal groupings).

TABLE I CARNATIC MUSIC Svaras AND THEIR FREQUENCY RATIOS

SNo.	Carnatic Music *Svara*	Label	Frequency Ratio
1	Sadja (Tonic)	S	1.0
2	Shuddha rishaba	R1	(16/15)
3	Chatushruthi rishaba	R2	(9/8)
4	Shuddha gAndhara	G1	(9/8)
5	Shatshruthi rishaba	R3	(6/5)
6	SAdhArana gAndhara	G2	(6/5)
7	Anthara gAndhara	G3	(5/4)
8	Shuddha madhyama	M1	(4/3)
9	Prati madhyama	M2	(17/12)
10	Panchama	P	(3/2)
11	Shuddha daivatha	D1	(8/5)
12	Chatushruthi daivatha	D2	(5/3)
13	Shuddha nishAdha	N1	(5/3)
14	Shatshruthi daivatha	D3	(9/5)
15	Kaisika nishAdha	N2	(9/5)
16	KAkali nishAdha	N3	(15/8)

Indian Music and Western Music Comparison

Before getting into the specifics of Carnatic music, we'll talk about the broader qualities of other musical traditions and how they compare to Carnatic music.

Tzanetakis and Cook (2002) divide music into categories based on genre and whether or not it is considered classical. To classify music, one may divide it into Western and Indian traditions, but there are other world music traditions as well, including Chinese, Indonesian, and Persian. In these essays, we examine the similarities and differences between Western and Indian musical traditions. The letters C, D, E, F, G, A, and B indicate musical notes in Western music, whereas the Indian swaras S, R, G, M, P, D, and N represent the same notes in Indian music. Rhythm and melody, which relate to repeating musical patterns and the structure of the beat, respectively, are two hallmarks of Western music. Ragas are sequences of notes that have a specific meaning in Indian music, and the rhythm is expressed by the Tala, which may have a variety of beat patterns.

Yet there's a huge gap between the two systems in terms of presentational preferences, chord presence/absence, and interval density throughout an octave. Table 2 displays the differences.

Table 2 Comparison between Western and Indian Music

Western Music	Indian Music	Inference
Chords, Orchestration, Harmony Present – Refers to the presence of more than one frequency at a time or one melody at the same time	Chords, Orchestration, Harmony are absent	Only one frequency is present at a time in Indian music
Vertical Arrangement of Notes – overlapping of notes	Horizontal – One Note follows the other	Some Instruments are typical for Indian music to allow for this horizontal arrangement – eg. Veena
Even Tempered system of notes	Just Tempered syste of notes	Any frequency can be used as the starting note in Indian music and the frequency of a note is continuous rather than discrete
Semitones	Microtones / Semitones	Intervals of an octave are flexible
Music is first composed and then the musician plays it Little scope for improvisation	Melody is fixed and then the musician plays it – a lot of improvisation possible	Introduces the concept of Raga and the swaras of the Raga can be improvised to do ornamentation to the Raga
Improvisation in semitones is not possible	Improvisation in Raga is a key to convey Emotion	
Sound is thought of as blocks or pieces of music	Sound is not thought of as blocks of notes, but as a thin wire of flow	
Absence of Gamakas and Meends	Presence of Gamakas and Meends	Gamakas refer to pitch inflexions, where a swara is continuous rather than discrete / Meends is a slower Gamaka.

There are too many differences between Indian and Western music for algorithms originally developed for Western music to provide satisfactory results when applied to Indian music. The just-tempered note system, Gamakas, and the use of microtones in addition to semitones are all factors that must be considered while developing new algorithms for processing Indian music.

MUSIC SIGNAL PROCESSING

Each signal recognition program will include modules for preprocessing, segmentation, feature extraction, model construction, and a recognizer to pick out the relevant data. In the context of Indian music, effective algorithms are required to separate the many musical and non-musical components of a Carnatic music signal (including Shruthi, Tala, Swaras, Raga, and Singer, Instrument, Emotion, and Genre) from one another.

SIGNAL SEPARATION PRIOR TO PRE-PROCESSING

In this research, we tested two different music signal separation algorithms to see whether or not they were suitable for use with Carnatic music. It has been shown that (Zhang and Zhang 2005; Every and Szymanski 2004). We have found that the one presented by Zhang and Zhang (2005) is more suited to Carnatic music since it keeps the harmonic values of the frequencies relatively unchanged. The system is trained with both vocal and instrumental music in order to get the average harmonic structure value, and a constant value 'd' is then used to set thresholds for distinguishing between vocal and instrumental signals based on the spectral peaks in each frame (Zhang and Zhang 2005). The authors determined this constant based on characteristics of Western music; hence it is not directly applicable to Carnatic music, which has a high degree of harmonic complexity and frequent shifts in note frequencies (swaras). In this thesis, the threshold constant 'd' was calculated by continually comparing the output signal with the input signal in order to extract the voice and non-voice components.

SEGMENTATION

Ragas are complex musical compositions that need division in order to be fully appreciated, and understanding the swaras is the first step toward this goal. Each piece of music has an associated Phrase that may be used to indicate when the piece begins and ends. To paraphrase Sambamurthy, "Tala has a predefined pattern, and each Tala should account for one, two, four, or eight swaras, resulting in varying length segments" (Sambamurthy 1983). In this thesis, segmentation is carried out utilizing elements of Carnatic music known as Tala. Time-based Tala identification is the first step in our Tala-based segmentation process. A signal may be split up into its constituent parts by comparing the times of its onset and offset to the Tala. In the event of over-segmentation, the auto-correlation measure is employed to combine individual segments into larger wholes. It is considered that after the segmentation and recombination process, each segment represents a swara. As a musical element, the discovered Tala is related to the input composition by segmentation.

CONCLUSION

The creation of metadata for musical excerpts is a crucial and difficult problem in the field of music information retrieval (MIR) for Carnatic music. There are now various attempts to give

information for musical portions, however they are relatively disjointed and their outcomes are hard to compare. Modeling Carnatic music for use in MIR applications' different processing tasks is discussed in this study from a categorical perspective. Using a formal, categorical method, we have defined the intricacies of traditional Carnatic music, which is based on raga and tala frameworks. In this research, we provide a conceptual model that may be used to describe any musical segment in order to get its corresponding metadata. Our work on content extraction from Carnatic music is the first of its type, since it makes use of the specific features of this musical style. Major components of the music processing system that take into account Carnatic music features are segmentation, feature extraction, and model creation. Additionally, in Carnatic music, identifying the tonic, a challenging challenge in music processing, is essential for identifying the Raga and the singer.

REFERENCE

1. Pranathi Diwakar "Resounding Caste: Practices of Distinction, Urban Segregation, And Musical Politics in Chennai, India"2022

2. Magacho-Coelho, Cristiane & Camargo, Zuleica & Filho, José. (2022). Dermatoglyphic and acoustic analysis of singing voices: a multiple case preliminary report. Revista CEFAC. 24. 10.1590/1982-0216/20222426821.

3. Rupert Avis et.al "Bi-musical Curricula and "Abyssal Thinking": The Case of KM Music Conservatory, India" Action, Criticism, and Theory for Music Education September 2019, Volume 1 Action, Criticism, and Theory for Music Education September 2019, Volume 18 (3): 26–55 https://doi.org/10.22176/act18.3.26

4. Lee JM, Roy N, Dietrich M. Personality, Psychological Factors, and Behavioral Tendencies in Children with Vocal Nodules: A Systematic Review. J Voice. 2019 Nov;33(6): 945.e1-945.e18. doi: 10.1016/j.jvoice.2018.07.016. Epub 2018 Oct 24. PMID: 30529034.

5. Sanju, Himanshu & J, Nikhil & Kumar, Prawin. (2016). Effect of Carnatic Vocal Music Training and Experience on Cortical Auditory Evoked Potential. Journal of Hearing Science. 6. 10.17430/895685.

6. Tanya Kalmanovitch "'Indo-Jazz Fusion': Jazz and Karnatak Music in Contact"2008

7. sangamanatha, Ankmnal veeranna & Fernandes, Jacqueline & Bhat, Jayashree & Srivastava, Manav&Udupa, Prakrithi. (2012). Temporal Resolution in Individuals with and without Musical Training. Journal of indian speech and hearing association.

8. Mishra, Srikanta& Panda, Manasa. (2013). Experience-dependent learning of auditory temporal resolution: Evidence from Carnatic-trained musicians. Neuroreport. 25. 10.1097/WNR.0000000000000093.

9. K. K. Ganguli, A. Lele, S. Pinjani, P. Rao, A. Srinivasamurthy and S. Gulati, "Melodic shape stylization for robust and efficient motif detection in Hindustani vocal music," *2017 Twenty-*

third National Conference on Communications (NCC), Chennai, India, 2017, pp. 1-6, doi: 10.1109/NCC.2017.8077055.

10. Krishna TM, IshwarV. Carnatic music: Svara, Gamaka, Motif and Raga identity. In: Serra X, Rao P, Murthy H, Bozkurt B, editors. Proceedings of the 2nd Comp Music Workshop; 2012 Jul 12-13; Istanbul, Turkey. Barcelona: Universität Pompeu Fabra; 2012. p. 12-18.

11. Maria Panteli "Computational analysis of world music corpora"2018

12. Polat, Zahra & Atas, Ahmet. (2014). The Investigation of Cortical Auditory Evoked Potentials Responses in Young Adults Having Musical Education. Balkan medical journal. 31. 328-34. 10.5152/balkanmedj.2014.14171

13. Padi, Sarala&Breiner, Spencer & Subrahmanian, Eswaran & Sriram, Ram. (2017). Modeling and Analysis of Indian Carnatic Music Using Category Theory. IEEE Transactions on Systems, Man, and Cybernetics: Systems. PP. 1-15. 10.1109/TSMC.2016.2631130.

14. Venkatesh Kulkarni "Towards Automatic Audio Segmentation of Indian Carnatic Music"2014

15. Ravikumar, Arunachalam & Boominathan, Prakash & Mahalingam, Shenbagavalli. (2013). Clinical Voice Analysis of Carnatic Singers. Journal of Voice. 10.1016/j.jvoice.2013.08.003.