

1. Introduction

Abstract: Chapter 1 introduces the historical, conceptual, methodological, and theoretical framework of research into Indian film and media arts sound production. Setting the book's scholarly tone, several concepts are discussed as key research entry points. Critically listening to the trajectories of sound production in India, a hypothesis is proposed exploring technological innovations and shifts that have led to manifold sound recording and presentation advances through various production phases. In this chapter, historical trajectories are studied to understand the shifts in various differing yet concurrent sound practices used to engage audiences. Critical observation, reflection, and analysis of passages of sound from representative Indian film and audiovisual media works, specifically from the three phases of sound production identified, are made to qualify these claims.

Keywords: Indian cinema, sound studies, realism, media aesthetics, media art history, film sound

Background Sounds

In the autumn of 2006, I was a final-year student of audiography¹ at the Satyajit Ray Film and Television Institute (SRFTI),² a prestigious institute for film education in India. I was invited to speak about my experience as an emerging sound art practitioner and my concerns regarding the use of sound in cinema at a conference titled *Sound Cultures in Indian Cinema*.³ The conference was held with the intention of launching an Indian film

1 There are no academic institutions in India for sound art studies per se. In India, audiography is a field concerned with the study of sound recording and design, primarily in the context of film and music production, but when choosing their personal projects, enthusiastic students can push for artistic freedom and are encouraged to experiment.

2 See: www.cilect.org/profiles/942#YI_LJSN95-U.

3 See: <http://osdir.com/ml/culture.india.sarai.reader/2006-11/msg0001.html>.

sound research programme in the Department of Film Studies at Jadavpur University in Kolkata. I presented a student paper at the conference, which was later published in the *Journal of the Moving Image* (2007).⁴ The paper was my first critical intervention within the field of (film) sound research and, as such, allowed me to enter academic debates around sound in film and audiovisual media as an active sound practitioner and artist.

This intervention was significant for several reasons. Firstly, as a sound practitioner, that is, one who explores the medium of sound for aesthetic, cultural, and artistic purposes, as well as one who theorizes about it, I was able to offer novel insights into the ongoing academic debates in film sound research, which, up to that point, had been based on mostly non-concrete ideas about sound recording and design in films by seasoned academics, who were not sound practitioners themselves. Secondly, the process of devising the paper also helped to advance my own development as an artistic researcher and thinker, allowing me to question the established standards of sound practices that I had come to know through my film school education. The technologically deterministic approach⁵ that I had to deal with in my own studies as a student of sound production was the area I chose to question and discuss in my student paper. I also confronted the lack of use of site-specific sounds or ambience in Indian films and intended to shed light on how ambience could contribute to the sense of place if given enough scope in filmmaking. I argued that imposed limitations practiced in standard film sound recording and design create lapses in the inclusion and recognition of site-specific sound information and the sonic reality in cinematic space. This critical stance was in response to the screen-centric and visually dominated field of film production. The paper was an initiation into my ongoing efforts to articulate my artistic practice and research creation with sound within a growing interest in Sound Studies, and academia in general. The paper not only aimed to voice my concerns on these issues but also intended to situate my inquiry and practice within this conundrum and in the genealogy of sound practice in the Indian subcontinent prevalent at that time. These questions and polemics were crucial in the conception and development of this book.

4 See: www.jaduniv.edu.in/templates/newpages/ju_journals.html#mi.

5 Film school education in India mainly revolves around cinema technology in order to train students in the skillful operation of the tools and machines necessary for recording and production. This overt emphasis on technology often ignores the aesthetic sensibilities of working with and thinking through, in my case, the subtleties of sound and listening. Students who are sensitive to the artistic potential of sound may take distance from the educational system and create their own practices independent of the intervention of film school mechanisms.

By describing my background, the case that I would like to articulate here is the potential contribution that I can make to existing research in film sound as someone who is actively involved in sound practice, and how this contribution can be seen as novel and relevant to generating new knowledge. My inquiry also drives the search for a comprehensive positioning of the sound practitioner within the discourse of sound in film and audiovisual media.

If I look back on my aforementioned first academic paper, much has changed since its publication in 2007, and these changes are indeed instrumental in posing the pertinent questions I asked at that time, once again, within a new context – the context of a thorough digitalization of contemporary sound production and its ramifications for sonic experiences. Regarding the issue of an alleged underestimation of the field of sound in Indian films (Rajadhyaksha, 2007; Gopalan, 2002; Ganti, 2012), I lamented in the above-mentioned paper that Indian cinema has generally seemed to be hostile to the rich and realistic site-specific sound spectrum on a:

[M]arried soundtrack⁶ even when a film is shot on location. On location, sound is usually controlled to enter film space, and, on a film set, sound is limited to mere voice and sync effects, making the construction of a soundtrack mostly dependent on asynchronous means of sound sourcing such as available stock sound. In the process, film sound, instead of capturing the vibrant site and its spatial dynamics, drifts away from documenting the sound of an original space. Sound-making goes closer to a synthetic design by a sound operator working under the spectre of mechanical craftsmanship; the sound practitioner's religion of spontaneous hearing loses validity. (Chattopadhyay, 2007, p.x)

But the causes for this lamentation did not remain for long. A revolution was already in progress in Indian cinema following the decision, after much deliberation, to shoot the film *Lagaan* ('Land Tax') (Gowariker, 2001) with 'sync' sound made with digital technology.⁷ This revolution brought an awareness of how the direct recording of location sound and the live performance of actors are perceived by filmgoers as far more convincing

6 A 'married soundtrack' is the final mix of the soundtrack synchronized with the moving image on the final mix of all the audiovisual information on the cinematic media, known as 'married print' in film sound practitioner's terminology.

7 An abbreviation of synchronized sound recording made on film location, or the film set, gathering mostly the live performance of actors' voice, effects, and ambience, instead of re-creating them inside the studio. This term will be discussed later in detail.

and realistically believable than the techniques of dubbed films of the 1960s, 70s, and 80s that were exemplifying the established industry standards (with the exception of a few independent filmmakers following a different practice). This dawning awareness was significant in fundamentally shifting the spectator's experience of sound, namely in the proliferation of (an apparent) realism, exploring the 'capacity not only to mirror but also to govern the human perceptual apparatus' (Rogers, 2013, p. 32) towards an 'embodied experience'.⁸ This sense of realism and embodiment has been achieved, I assume, through a recognition of the specifics of the spatial sensations in the narrative or, more generally, through a sensitivity to the 'site of sound' (LaBelle and Martinho, 2011). If we look at Indian cinema in the period between 2001 and 2009, there were a number of films that embraced this methodology of sync sound or location-specific digital multi-track recording in live synchronization before it gradually became the standard from 2009 onwards. The novel experience of sync sound textures replete with evidence of the site led to the popular appreciation of a revived sense of sonic realism and spatiality. However, this development didn't make my earlier lamentation completely invalid. My previous concerns about a lack of spatial information in the sound of Indian cinema led to new questions: what do these new developments signify, and how can they be understood from a historical perspective? This set of renewed inquiries has inspired me to take up the course of the present project, and it is these broader questions that drive this book.

If we look at the trajectories of sound production within the cinema of pan-India, we will observe that sound has been inconsistently rendered and produced through various phases of production practices under the effects of technological transformations, innovations, and resultant aesthetic shifts. There have been phases of sound practice, such as the entire 'dubbing era' (1960s–1990s) that cared less about reality while giving more importance to typical entertainment tropes such as 'song and dance' sequences. However, there are also phases such as the 'digital era' (2001–) where the 'realistic' and concrete representation of site is observed. The dominant factors that have determined these shifts are rooted in technological developments (Kassabian, 2013; Kerins, 2011, 2006; Lastra, 2000; Altman, 1992), whereas

8 An embodied experience of sound in film and other mediated environments is provided by site-specific sound recordings – including room tones, low frequency rumbles, and other bodily-perceptible ambient sounds – dispersed in a spatial organization following a multi-channel surround sound design. As argued by Mark Kerins (2006, 2011), these practices find prominence in the digital era of sound production. I am using the term in the context of discussing the digital era in Indian cinema to underscore the unique capacity of surround design and sync sound.

certain aesthetic choices were made available by these technological phases shaping the historical evolution of sound practice in Indian cinema. Here, this history is studied and written about in order to understand the various differing and concurrent practices, methodologies, and approaches, as well as the shifts in recording and spatially organizing sound for the purpose of storytelling. I examine how presence and diegesis are approached and produced during the creative construction of the pro-filmic space⁹ through the different eras of sound production in Indian cinema recognized worldwide, primarily for its voluminous film industry.

The Listening Field

As Susan Hayward has observed, the coming of sound in cinema introduced 'a crucial element to the registering of authentic reality'; henceforth, sound film 'was touted as being closer to reality' (2006, p. 359). Adding sound to the screen image could provide a perceptually realistic delineation of the site through the process in which, as film scholar Peter J. Bloom suggests, 'the experience of sound may become more spatially defined. By contrast with a two-dimensional image, the temporal nature of sound becomes related to the hearing subject's own location in any given space' (2014). The spatial characteristics of sound were recognized and explored after the coming of sound in cinema as an anchor to the story-world as the tangible setting of a site that could be associated through the spectator's lived experience of place.

Sound recording also opened up the palette for film practitioners to choose materials for providing spatial evidence in terms of site-specific details. In this palette, sonic elements such as voice, music, and effects, and background noises like natural and environmental sounds, along with other location-specific sounds that were recorded on site, primarily contributed to the realization of auditory settings since the time of the talkies. My research interest for this book lies in understanding the trajectories of this practice in India, that is, the way different layers of sound are recorded and spatially incorporated so as to produce sonic experience in film and audiovisual media in the contemporary digital realm. This trajectory perhaps poses a large historical canvas, but the singular focus of this project remains on a practice-led study of the creative practice of sound to construct and produce the spatiotemporal experiences in Indian film and audiovisual media through different technological phases. A qualitative evaluation of

9 The area in front of the camera's recording field is known as the 'pro-filmic space'.

the production practices and various methods used by sound practitioners working within the film industry, as well as description and analysis of a number of relevant works, will inform this inquiry. Despite the rather broad historical framework that this goal implies, my aim is to study film sound while questioning classical assumptions of the sound-image relationship in film and media studies and shift the focus onto the creatively constructed sonic spatiality in the diegetic world of film and audiovisual media as a vital narrative strategy.

Given the sporadic scholarly attention to the field of sound, Indian films are generally criticized for producing transcendental sound experiences, exemplified by an overwhelming use of sloppy and poor sounding 'song and dance' sequences (Booth and Shope 2013; Morcom, 2016). In this practice, the careful incorporation and attentive organization of sounds are generally ignored in the narrative strategy of Indian film production (Rajadhyaksha, 2007; Gopalan, 2002; Ganti, 2012). There are indeed many examples from popular Indian films and media productions in which mindful sound design is not apparent; often a loud, high-pitched auditory setting is meant to provide a remote and imaginary sonic landscape. Challenging this popular notion, I intend to demonstrate that this generalized perception of sound practice in India is erroneous if we consider the historical trajectories of sound production. The advent of digital technology makes it possible to incorporate rich layers of sound in the production scheme of current types of Indian films and audiovisual media. A thorough study of this historical trajectory via detailed case studies and close readings of particular films beyond the popular and commercial so-called 'Bollywood' films – including regional films – focusing on the creative use of sound will help to put the inquiry, analysis, and observations in context. A practice-based perspective of attending to the methods and approaches undertaken by sound practitioners will provide the empirical evidence to qualify the claims; extensive interviews conducted with practitioners, based on critical self-reflection, are the primary sources of real-world knowledge in this book.

Following the trajectories of film and audiovisual media production in India, this study will reveal that sounds have been inconsistently rendered through various phases of production practices due to the effects of technological innovations and shifts. For instance, there have been phases, such as the entire period of the 'dubbing era' (1960s–1990s), that were less concerned about the quality of sounds, and gave more importance to the spectacular 'song and dance' sequences often placed within the flow of the narrative as interruptions and suspension of the story. However, there are also phases such as the 'digital era' (2001–present) where 'realistic' and more

concrete representations of sound are observed, as mentioned earlier. The dominant factors that have determined these shifts are rooted in technological developments (Kassabian, 2013; Kerins, 2011, 2006; Lastra, 2000; Altman, 1992); certain aesthetic choices were made available by these technological applications, shaping the historical evolution of sound production practices in India. This history will be thoroughly studied in order to understand the various differing and concurrent practices, methodologies, and approaches, as well as the shifts in recording and organizing sound. The book will divide the trajectories of sound into its three most prominent markers, primarily based on the aesthetic shifts informed by technological changeovers and related innovations in sound recording. This historical division will be articulated in terms of three primary phases, namely: the optical or 'direct' recording era as it developed in the early talkies (1930s–1960s), the magnetic tape-based recording that triggered dubbing practices (1960s–1990s), and the contemporary digital multi-track sync recording and surround sound era (2001–present). Each of the subchapters in the book will take these three production phases as fundamental mechanisms and systems for certain kinds of aesthetics that emerge and permeate the sound production practices shaping film and media productions in India. Taking this model as a historical structure, the rest of the book will be devoted to a descriptive analysis of various modes and facets of sound production in India, namely Indian cinema and audiovisual media, from mainstream popular Hindi language films made in Mumbai to regional cinemas from Bengali, Malayalam, Tamil, among others, as well as a few audiovisual media works. This comprehensive study and detailing of sound production practices in India through a critical listening to a number of film and media examples will be contextualized in the light of film and media studies, film and media production, media art history, and sound studies.

In the arts and humanities, 'sound studies' has emerged and rapidly established itself as a vibrant and productive academic field resulting in the current profusion of scholarly writings in the broader areas of music history, musicology, performing arts, and culture focusing on sound and listening. Three consecutive compendia such as *The Routledge Sound Studies Reader* (2012), *The Oxford Handbook of Sound Studies* (2013) and *The Routledge Companion to Sound Studies* (2018) have been complemented with the *Journal of Sonic Studies* (Research Catalogue platform), and several other peer-reviewed journals that are entirely dedicated to the studies of sound. These publications show that the study of sound is indeed now a relevant area of research receiving wider academic attention within the broader contexts of music, performing arts, musicology, and music studies. Notwithstanding this

rapidly growing body of work (Sterne, 2003, 2006, 2012; Born 2013; Théberge, Devine, and Everett, 2015; Dyson, 2009, 2014; Demers, 2010; Novak and Sakakeeny, 2015; Blesser and Salter, 2009; Bijsterveld and Pinch, 2013; Bull et al, 2018), much of the attention has been invested in studying sound within an American and/or European film and media cultural context. Sound in other cultural contexts such as India has largely remained underexplored, even though India is one of the world's largest producers of film, music, and audiovisual media, with a formidable global presence as an emerging giant in the performing arts, music, and cultural production. This book intends to fill this void by developing a comprehensive understanding of the unique sound world of Indian film and audiovisual media production, through an examination of the historical developments of sound production practice and the corresponding aesthetic shifts in film and media.

A Sonic Framework

Film sound scholarship

The past few decades have seen the establishment of specialized scholarship for the study of film sound. The early writings of Rick Altman and Tom Levin on the history of sound technology have been instrumental in this developing field, examining sound's relationship to the moving image. Michel Chion's seminal works, including of course *Audio-Vision* (1994), have become canonical texts on film sound as part of a developing corpus of knowledge focused on understanding the audio-visual relationship operating on screen. These writings have consistently studied sound in relation to the visual image, whereby sound has been regarded as an element predominantly enhancing the cinematic narrative, a reinforcement of the visual testimony on screen, and/or underlining the emotive potential of a scene. This scholarly stance considers the 'soundtrack' as a secondary and one-dimensional accompaniment to the visual storytelling without enacting an autonomous impact on the multi-sensory cinematic experience. Chion argues that we don't see images and hear sounds as separate channels, we audio-view a trans-sensory whole (1994), but in multi-channel surround environments, some off-screen sound elements indeed demand having autonomous impacts beyond the viewing aspects of cinematic experience. As charted in my book *The Auditory Setting* (2021a), in recent works, however, an apparent shift seems to be emerging. Among contemporary scholars, Giorgio Biancorosso (2009), Randolph Jordan (2012) and myself (2016, 2017,

2018, 2021a, 2021b) question the overarching comparisons of sound with image and emphasizing the role of sound and the potential of listening by taking sound as a specific and separate area of research. The idea that sound can be studied separately from the moving image, and that sound in movies is more than the flat and screen-centric soundtrack following the visual narrative, has destabilized the notion of a 'soundtrack'. This term has retained its historical relationship to an optical track on the filmstrip, mixed with music, thus retaining a sense of linearity and one-dimensionality literally alongside the visual narrative. Following Biancorosso and Jordan, and continuing my own scholarly work (2021a, 2021b), in this book I will question the traditional idea of the 'soundtrack' in Indian cinema, advocating for a more fluid and malleable multilayered sonic environment. This is particularly true for the production methodologies evident in digital production, due to the fact that the effects of spatial practices with sound transcend a linear representation of the soundtrack towards a spatially evocative sound environment that creates elaborate and fluid cinematic spaces where the epistemological grounding of the sounds (Branigan, 1989) to their respective screen-centric visual sources is reordered. The wider off-screen diegetic space available in digital cinema systems (Kerins, 2011), appearing to be immersive and enveloping toward the embodied experience of the listening audience (Ihde, 2007), also opens up the scope for multiple interpretations of sound (Nancy, 2007; Chattopadhyay, 2014). This new setting, as I pointed out in my earlier research (2021a), leads to an interactive and flexible sonic space (Dyson, 2009) that often appears to render itself beyond the visual image and constraints of the screen. Reading the actual impacts and manifestations of creative sound practice and implications through various phases of production becomes relevant and necessary in this altering discourse in film sound research.

There have been sporadic efforts and attempts made to study the use of sound in Indian cinema, but much of this scholarship has been focused on the use of songs (Mukherjee 2007, et al.), voice, and background musical scores (Booth and Shope, 2013; Morcom, 2016) in popular Indian films. Indian film music has indeed been a focused area of scholarship; for example, the work of Alison Arnold (1991) analysed Hindi film songs along with the studio practices that produced these songs. Music critics like Bhaskar Chandravarkar and Ashok da Ranade have also illuminated the field, writing essays about music in Indian films. Indian filmmakers like Satyajit Ray (1976, 2011), Ritwik Ghatak, Mani Kaul, and Kumar Shahani have commented on the use of music in Indian film, among which Kaul's writings (1977, 1983, 1991) have been noteworthy for their erudition, insights,

and incisive understanding of classical Indian aesthetics around visual and aural perspectives and temporalities.

The history and proliferation of sound technologies such as the radio and the gramophone in the 1920s and 1930s India are researched in the ethnographic writings of Stephen Hughes. Early cinema and sound in the talkies have also found sustained scholarly attention. The edited volume *Aural Films, Oral Cultures: Essays on Cinema* (2012) probes into Indian films from the early sound era. The essays included in this book contain important documentation of the period of the so-called 'talkies' from the early sound era. These historical engagements with sound in early Indian films bring together debates on the transmission of sound technologies from the West and their applications in India. Focusing on one of the early talkie studios, New Theatres, this study actively engages with the proliferation of sound technology in the 1930s from the early direct sound era in Indian cinema and the socio-political contexts within which such technological changes occurred. Musicologist Gregory Booth's writing (2013) also studies the circulation of sound technologies such as the gramophone, radio, and cassettes on the practice of musical composition and orchestration in the early Hindi film industry.

As I have mentioned, the edition of the *Journal of the Moving Image* (2007) from Jadavpur University's Film Studies Department focused entirely on the aesthetics of sound in Indian cinema. This issue, where I had my first article published, was a crucial intervention in this field. The issue indeed catapulted a critical interest in film sound research in India and, on a very personal level, launched my research into sound.

These infrequent scholarly interventions are often focused on the contextual knowledge around film (sound) history, such as the socio-economic conditions that shaped the technological transformations in early talkies in India and studio-era sound practices. While this social scientific approach is revealing from an interest in film history and theory, social, and cultural studies, it is, however, not adequate to grasp the vast and varied fields of sound in Indian film and audiovisual media from aesthetic, historical, and production perspectives. A creative practice with sound, particularly components like ambience and sound effects, which are underlined by sound practitioners as critical elements in film sound organization (Chattopadhyay, 2021b), is still underexplored and requires further study. I intend to address this lack by developing a systematic, creative practice-based understanding of the unique sound world of Indian film and media. At the core of this research is a consideration for a phenomenological approach of attentive listening to the sound experience in Indian films and audiovisual

media, as well as self-reflective analysis of this personal experience and critical engagement with the sound practitioners themselves in extensive fieldwork as primary sources of knowledge, rather than relying on contextual information to write a history.

The ever-growing field of Sound Studies across the globe

In the growing field of sound studies, in-depth as well as inspired and dedicated inquiries into the sound practice in the Indian context should be accommodated and appropriated, contributing to the field of sonic research. Jay Beck and Tony Grajeda quote Rick Altman in the introductory chapter 'The Future of Film Sound Studies' in their edited anthology *Lowering the Boom: Critical Studies in Film Sound* (2008) to emphasize the appropriateness and legitimacy of specialized investigations into film sound studies and studies of sound (media) production as part of the growing field of sound studies. Within an emerging discourse of practice-based research in film and media studies, the in-depth study of sound practice in India demands to be pursued from the novel perspectives of sound studies – a perspective that allows for studying sound beyond the domination of the visual image and beyond the constraint of the screen, allowing the research to focus on the emerging spatiality evident in Indian sound practices, especially in light of the digital innovations facilitating spatial practices in contemporary film and media arts, including India. Therefore, this inquiry will be primarily informed by studies in sound production (Holman, 1997, 2002; Kerins, 2011; Sergi, 2004; Sonnenschein, 2001; Buhler, Neumeyer, and Deemer, 2010; LoBrutto, 1994) and drawing upon Sound Studies (Sterne, 2012; Born, 2013; Théberge, Devine, and Everett, 2015; Dyson, 2009, 2014; Demers, 2010; Novak and Sakakeeny, 2015; Blesser and Salter, 2009), with investigations of diegesis, mimesis, and narration in cinema and other media art (Bordwell and Thompson, 1997; Percheron, 1980; Burch, 1985, 1982; Kassabian, 2013; Weiss, 2011), the notion of sonic presence (Doane, 1985; Skalski and Whitbred, 2010; Grimshaw, 2011; Reiter, 2011; Lombard and Ditton, 2006), and the history of Indian cinema (Rajadhyaksha, 2007; Gopalan, 2002; Mukherjee, 2007; Allen, 2009; Carrigy, 2009a, 2009b; Chattopadhyay, 2015, 2016, 2017; Sengupta, 2007). The research will draw from studies in film sound (Altman, 1992; Balázs, 1985; Biancorosso, 2009; Chion, 1994; Lastra, 2000; Bloom, 2014), sound perception and cognition (Bordwell, 2009; Waller and Nadel, 2013), phenomenology of sound (Ihde, 2007; Sobchak, 1991; Nancy, 2007). This book will have good company among a growing body of sound studies literature across the globe beyond its Eurocentric delimitation: for example, *Hungry*

Listening: Resonant Theory for Indigenous Sound Studies (Robinson, 2020) and the edited volume *Remapping Sound Studies* (2019).

Drawing inspiration from these newer works, this book will examine the aesthetic shifts in sound practice in the light of technological innovations and the historical evolution of film sound in India to underscore complex interplays between the Western hegemony of technology pressuring to embrace modernity and the emergence of a syncretic, hybrid, and assimilated form with traditionalist traces in Indian film sound that negotiates Indian epistemology with modernist pressures. The critical engagement with relevant literature in the non-Western canons will inform the research and will be considered useful for the generation of new knowledge in the ever-growing field of sound studies beyond its inherent Eurocentric vision. By drawing attention to an ignored site of inquiry, that is, sound practices in India, this book will help address a number of critical issues in contemporary sound studies, such as decoloniality, Global Souths, and non-Western epistemologies, as well as fundamental topics such as storytelling, diegesis, and realism.

Technological innovations towards the digital realm beyond Eurocentric sound

Film scholars have already pointed out that technical advances in cinema have affected the spatial aspects of sound creation in the various eras of sound technology (Bordwell and Thompson, 1985). I assume the evolving sense of spatiality in Indian cinema is primarily supplied by additional layers of environmental sounds while other layers such as voice, music, and sound effects remain largely screen-centric through technological transitions from monaural to stereophonic and digital surround environments. There are instances of the voice carrying spatial information, particularly in the case of digital multi-track synchronized or 'sync' sound practice, as Mark Kerins shows (2011). Instead of dubbing inside a studio – a practice that was standardized in many national cinemas similar to India's, for a large part of their histories (1950s–2000) – the sync track would include some spatial information directly recorded from the location such as original reflections from indoor rooms ('room tone') and so forth. This would add to the overall sense of spatiality, but it is the layer of environmental sound that would carry the *primary* information as well as being the basic tool in the hands of the sound practitioner to reconstruct the site and to enhance the 'ultrafield' of the sonic experience (Holman, 2001; Kerins, 2011). Following this argument, this book considers all the layers of sound horizontally, discussing voice and

music alongside environmental and incidental sounds and sound effects in its research, critical analysis, and commentary.

In my previous book *The Auditory Setting* (2021a), I focused on a critical study of environmental sound use in global cinema. There, I noted that historically, sole reliance on the voice to carry out the primary threads of narrative has been lessening ever since other channels of sound have opened up to distribute the screen-centric appeal of films towards an expanded cinemascope and surround sound (Rogers 2013). This development can be seen as a shift away from the ‘vococentricity’¹⁰ of cinema (Chion 1994) towards a more inclusive realm of digital systems. Since the 1990s, a large-scale conversion from analogue recording, analogue production practices, and optical film exhibition to digital technologies has taken place. Digital technology has been integrated into the production and post-production stages of filmmaking. The ramifications of these developments have been far-reaching – it was particularly evident in the way cinematic experience changed through the radical use of sound, such as multi-track synchronized sound recording and surround sound design. In very recent times, digital multi-channel surround sound systems like Dolby Atmos and Auro-3D have altered the way in which the film ‘soundtrack’ is rendered and reorganized in cinema. These newer environments have reconfigured the spectator’s experience of the cinematic space, contrasting considerably with earlier predominantly screen-centric mono and stereophonic settings, integrating and augmenting the monaural and stereophonic aesthetics into the surround environment through the reordering of the spatial organization of cinematic sound. Following these transitions, contemporary Indian cinema facilitates specific practices of sound to create cinematic experiences which, I show in this book, are spatially wider, more elaborate and fluid compared to the screen-centric mono-aural soundtrack or the flat surface of a slightly wider yet still within-the-screen, stereophonic composite soundtrack. These earlier organizations of sound in Indian cinema anchored the story-world narrated on screen, altogether ignoring the specifics of site in diegesis, yet evoking sound’s emotive potential by using post-synchronized effects and background music. I will argue that digital era’s sound practices incorporate the surround multi-channel design of site-specific and other locative sounds that handle the site in spatially

¹⁰ ‘Vococentricity’ is the term introduced by film theorist Michel Chion that refers to the tendency to organize the soundtrack in a hierarchy with the voice as the most important element. The other components of the soundtrack (e.g., music, Foley, ambience) are organized in relation to their interaction with the human voice (dialogue).

perceptible ways, rather than catering to a screen-oriented audio-visual contract as Michel Chion postulated earlier.

Chion's views of film sound (1994, 2009) may appear questionable in the current analysis of sound practice that enables more layers of sound to be included in the spatial organization of sound in cinema. In *The Auditory Setting* (2021a), I have elaborately discussed how, contrary to what Chion had envisioned (although primarily discussing American and European films), today's expanded universe of a (post-)global film sound experience builds multi-channel environments, which assume that audiences will understand sounds originating in the surround channels to be part of the same diegetic space as those originating on screen (Kerins, 2011) expanded with elaborate and autonomous details beyond the screen (e.g., the sound of an overhead airplane or a flying bird behind our head) in the Dolby Atmos sound environment of a cinema theatre. Innovative practices with sound in the digital era have led to newer experiences of cinema in which spectators engage with cinematic sites through immersive listening, employing spatial cognition of sound. These practices need new theoretical models and approaches in film sound studies beyond Chion and his contemporaries. The new approach will need to cater to the studies of sound in the contemporary digital milieu overcoming domination of the moving image with screen-centric interpretive tendencies. The approach will also need to include the various innovative threads of sound practices in discourse beyond the prevailing American and Eurocentric outlook of film sound studies. In this context, the current book project enables a refreshing, if not innovative, scholarly framework to study the increasingly important layer of sound in the digital realm, namely ambient sounds, and their role to enrich the cinematic experience by exploring sound's spatial dimensions. The 'spatial turn' (Eisenberg 2015) in Indian film sound production manifested by the use of site-specific sounds will be studied in the light of its trajectory of development from monaural synchronized sound recording and post-synchronous dubbing to the contemporary digital multi-track synchronized or sync recording, as well as from monaural and stereophonic mixing to digital surround sound design. Challenging prevailing American and Eurocentric sound scholarship, a systematic study of the use of sound in Indian cinema is considered not outside of this larger theoretical corpus but as a useful intervention and scholarly addition. It is needless to say that some theoretical references for this book were made having mostly examples of American and European films as case studies (e.g., Holman, 1997, 2002; Kerins, 2011; Sergi, 2004; Sonnenschein, 2001; Buhler, Neumeyer, and Deemer, 2010; LoBrutto, 1994; Sterne, 2012; Born, 2013; Théberge, Devine, and Everett, 2015; Dyson, 2009,

2014; Novak and Sakakeeny, 2015). Nevertheless, these references create the project's epistemological grounding of film sound studies where examples from Indian films can be historicized, theorized, and contextualized to cultivate an Indian epistemology in the field of sound studies as a novel and much-needed contribution.

Further Theoretical Considerations

Audio-audio relationship

Studying sound in film and media has all too often stagnated in investigating the audio-visual relationship (e.g., Chion, 1994). It would be worthwhile to shift the perspective on the complex relationship between different sound components: namely, voice, music, sound effects, and ambience or environmental sounds. There are typical hierarchies between these components, and often one component (e.g., voice) is given more importance over others (e.g., ambience) in narrating a story or depicting a situation.

In *The Auditory Setting* (2021a), I have discussed these hierarchical relationships, namely the voice as a primary sound component that includes dialogue between characters carrying the primary information of the narrative communicated to the audience (Bordwell, 1997). Amy Lawrence argues that in narrative cinema 'the synchronization of image and voice is sacrosanct' (1992, p. 179) emphasizing the necessity of the stricter method of sound production in regards to the voice, which must be connected with a 'body' on the screen. Mary Ann Doane affirms that dialogue or the use of the voice 'engenders a network of metaphors whose nodal point appears to be the body' (1985, p. 162). She further states that the sound of the character's speech or voice is strictly 'married to the image' (1985, p. 163) on the screen, making it creatively rigid as a sound component in cinema for spatial maneuvers unlike background sounds. Voice attributes in cinema are less 'spatial' in nature. Moreover, the post-synchronized voice, as produced by dubbing or similar practices, is 'disengaged from its "proper" space (the space conveyed by the visual image) and the credibility of that voice depends upon the technician's ability to return it to the site of its origin' (Doane 1985, p. 164), a condition which can be achieved by the technician's creative and innovative use of ambient sound components.

As indicated in *The Auditory Setting* (2021a), non-diegetic music in films creates situational feelings and underscores certain emotions. Film music is used 'largely to set mood or elicit a particular emotional response from the

audience' (Kuhn and Westwell, 2014). Film music tracks and sound effect tracks 'establish a particular mood' (Doane, 1985, p. 55) instead of providing a sense of space. Sound effects are also important for the narration, and for creating feelings of tension and horror. In the mixing stages, the hierarchy of different sound components follows certain conventions: 'Sound effects and music are subservient to dialogue and it is, above all, the intelligibility of the dialogue which is at stake, together with its nuances of tone' (Doane, 1985, p. 55). In this hierarchy, ambient sound remains fluid and malleable in the hand of the practitioner.

While elaborating the processes of sound production in Indian cinema, the practitioners interviewed in my book *Between the Headphones: Listening to the Practitioner* (2021b) underline that ambient sounds provide a specific atmosphere of a site in the construction of the pro-filmic space. To the sound practitioners of Indian cinema,¹¹ ambient sound injects life and substance not only to what we see on screen but also to the off-screen diegetic world. The practitioners use layers of ambient or environmental sound to construct the experience of reality by artistic means. These sounds help mount the sense of a specific place in Indian films consolidating their spatial dynamics.

Film space

The term 'film space' is defined as the space that the spectator encounters – a space that is organized through time (e.g., the linking of shots through sound editing). On the other hand, the area in front of the camera's recording field is known as the 'pro-filmic space' in the glossary of film terms (Sorfa, 2014). Combining these two definitions, I argue that the choice and arrangement of pro-filmic space substantially affect the spatial dynamics of the *mise-en-scène* of sound or 'mise-en-sonore' (I have used this loose coinage in my writings: Chattopadhyay 2016, 2021a) equivalent to the *auditory setting* – the actual sonorous environment that appears to the experience of the auditor – a setting that in turn influences the verisimilitude or believability of a film in the ears of the audience member. Film scholars Annette Kuhn and Guy Westwell define pro-filmic space as:

The slice of the world in front of the film camera; including protagonists and their actions, lighting, sets, props and costumes, as well as the setting

11 See: interviews with prominent Indian sound practitioners such as Dipankar Chaki and Dileep Subramaniam speaking about the ways they use ambient sounds in Indian cinema in *Between the Headphones: Listening to the Sound Practitioner* (Chattopadhyay, 2021b).

itself, as opposed to what eventually appears on the cinema screen. In studio-made fiction films, the profilmic event is a set constructed for the purpose of being filmed. At the other extreme, in observational documentary forms like direct cinema, filmmakers seek, as a fundamental element of their practice, to preserve the integrity of the real-life space and time of the profilmic event. Many films occupy a middle ground in their organization of, or relationship with, the profilmic event: as for example in the case of location-shot. (2014)

As the narrative rendering of the pro-filmic space in sonic terms, ‘mise-en-sonore’ or auditory setting¹² is understood as the simulated space of the fictional site, which is constructed in cinematic experience using environmental sound. This playful formulation of the term expands on James Lastra’s conceptualization of the term ‘pro-filmic space’ (2000) and draws on the definition of the same term by Annette Kuhn and Guy Westwell to explain roles of environmental sound in the process of narrative storytelling ‘to preserve the integrity of the real-life space’ (2012, p. 333). These ideas are discussed in detail in *The Auditory Setting* (2021a).

(Quasi-)diegesis and mimesis in film sound

It is necessary to consider the state of how the story-world of Indian cinema is formed given the rich storytelling traditions existing in the subcontinent ranging from oral storytelling to the audiovisual such as *Patachitra* and *Pater Gaan*.¹³ There is a limited vocabulary to discuss such syncretic practices in the Western film sound canon. The Ancient Greek notion *diegesis* denotes a process to narrate a contained story-world, which, as Mary Ann Doane has noted, is the internal space of the cinematic universe framed and constructed by the technical tools of filmmaking (Doane, 1985). As shown in *The Auditory Setting* (2021a), translated to sound, this term could be understood as relating to the creative layers of sounds that are made to emanate from the story space in which events occur. Claudia Gorbman defines diegesis as ‘the narratively implied spatiotemporal world of the actions and characters’ (1987, p. 21). Both Doane and Gorbman use the terms ‘space’ and ‘world’,

12 This term is formulated as a useful coinage to study the spatial practice of film sound in *The Auditory Setting: Environmental Sounds in Film and Media Arts* (Chattopadhyay, 2021a).

13 *Patachitras* are visual storytelling styles in Eastern India with accompanying songs, *Pater Gaan*, weaving stories together as a performative element. The songs follow traditional or modern tunes with old or new words composed for the specific stories told. The song sets the story along with the visual scroll and brings it to life in performance.

underscoring the constructed nature of the film space during narrative storytelling. In *The Auditory Setting* (2021a), I have discussed how the term 'diegetic sound' helps to consider the sounds that inhabit the constructed world and whose sources are visibly present within the space of filmic events. Likewise, any sound outside of the story-world of a filmic universe is termed non-diegetic. The most common example of non-diegetic sound is the amply used sound component in Indian cinema: BGM or background music, which the characters do not hear, and which is not present in the space of filmic events; therefore, BGM is not grounded in the filmic reality apart from expanding certain emotional situations to manipulate audience responses. While songs sung by the characters are diegetic, many of the accompanying instruments in the song remain invisible, and therefore non-diegetic. The stereotypical song and dance sequences in Indian cinema are therefore a hybrid of diegetic and non-diegetic elements – which I term 'quasi-diegetic' – indicating the illusion of diegesis in sound use. Site-specific sound effects, reflected voices, incidental, and ambient sounds can be regarded as the means of reinforcing a sense of diegetic realism by enhancing a site's believability in the story-world's spatial environment, to make the sound and image (of the site) 'credible' (Wayne, 1997, p. 176). Examining the spatial practice of sound to construct the site's relative presence in the story-world must take into account and interpret the concept of diegesis in the context of Indian films.

As I noted in *The Auditory Setting* (2021a), historically, diegesis is understood as the process of illustrating the story-world with all the narrative elements that are shown or inferred within the filmic content. The process allows for a certain mediated discernment of the phenomenal world within the story, including all the physical pro-filmic spaces framed inside the film, be they indoor or outdoor locations, or film sets and studios. These spaces might be narrated with their auditory features, characteristics, atmospheres, and 'soundmarks'¹⁴ (Schafer, 1994) in order to establish their presence in the mind of the audience, who can construe a diegetic world from the recorded and (re)presented sonic materials as they take in tiny aural hints to interpret contours of the sites from the relative volumes and spatial matrixing of these sounds. Noël Burch (1980) states that diegesis includes a description of the narrative action proper, including places, people, clothing, and sounds. In order to build a mediated story-world,

14 Inspired by the word 'landmark', the term 'soundmark' was coined by Canadian composer R. Murray Schafer to refer to a site-specific sound that is unique or possesses locational qualities, making it noteworthy in its usage to represent a place sonically.

diegesis is a sound production methodology whereby sound components like the voice and effects take crucial roles in telling a story. Film scholar Edward Branigan suggests that diegesis is the 'implied spatial...system of a character – a collection of sense data which is represented as being at least potentially accessible to a character' (Branigan, 1992, p. 35). Both scholars point out the necessity of the spatial component in narrative (re)construction of the pro-filmic space within film space. As we will see, sound practice in the digital era of Indian cinema brings such spatial components to the fore.

It is not new that the shifting sound practices in American and European cinema, impacting diegesis, have been studied using the theoretical corpus of narration and storytelling. However, in Indian film scholarship, this field of sound studies related to narration is relatively understudied. Writing on the specifics of narration in the digital realm of American cinema when using DSS (Digital sound systems), American film sound scholar Mark Kerins argues that 'filmmakers have...relied on ambient sound in the "surrounds" to set up diegetic spaces, and this trend has certainly continued with movies employing DSS' (Kerins, 2006, p. 44) – hinting at what I aim to underline in this book about an emergent diegetic spatiality and sonic realism found in the digital era of Indian indie cinema. In a later chapter of this book, I will explore sound practice in the Indian indies (independent films made outside the studio system, especially with regard to funding, working outside the filmstar system). The sonic realism approached in this breed of new Indian films is studied with careful attention so as to underline the fact that these emerging films are far more open to experimentation with the creative potential of sound.

In the above statement, Kerins writes about the narrative strategy of the practitioner embracing digital systems to produce enhanced diegetic spatiality, which contributes to the sense of sonic realism and presence. As he writes, the apparent completeness of the constructed aural environment in cinema suggests the relatively high (or, arguably, the highest) degree of presence in the rendering of the film space as (re)presented in the story-world. This story-world would be considered diegetic if the elements that belong to the film's narrative universe are included in the storytelling. In Indian cinema's analogue-era, diegesis is a crucial narrative device, as the dialogue often seems to 'tell' the story as narrators rather than using other mimetic elements of 'showing' such as ambient sounds. This book shows that such normative structure is destabilized after the digital.

The notion of diegesis in relation to sound has an aspect of mediation embedded within. This mediation allows the narrator to control what is revealed in the narration: objects, situations, spaces, and characters that

inhabit the story-world. The process of mediation follows two stages of sound production: the recording of sounds from the pro-filmic space, and the sound design in the studio to recreate and produce the sonic film space that I term the 'auditory setting'. Taking a parochial, and ideological stance (Kelman, 2010) against the low-fidelity environmental sounds and the mediation of sounds recorded from situated environments, Schafer stated: '[W]e have split the sound from the maker of the sound' (1994, p. 90). In this book, I will show how these 'torn' and 'ruptured' sound recordings go through further mediation in the hands of sound practitioners whereby sonic materials are processed and organized spatially to create new diegetic worlds that are often abstracted from their sites of recording – the realistic pro-filmic spaces of the locations or sets. This is particularly heard in commercial Indian cinema due to its generally escapist approach and tone often manifested in the heavy noise cleaning, rough editing, and compression of sounds.

Since film is always framed by the camera (and sound recorder), early cinema scholars have argued that 'it is therefore a diegetic form and not a mimetic one' (Prince, as cited in Kassabian, 2013a). Opposed to the basic principles of diegesis (i.e., narration and depiction), 'mimesis' suggests imitation (Weiss, 2011; Dumouchel, 2015). In essence, while diegesis 'narrates' the action, mimesis 'shows' the action (Kassabian, 2013a). I have discussed in *The Auditory Setting* (2021a) how the merging of these two approaches takes place in cinematic narration. Likewise, film theorist Anahid Kassabian suggests that narration through sound in cinema combines both strategies to a certain degree: 'Surely all realist film forms are both diegetic and mimetic in significant proportions, and it might be more interesting to consider how, when, and why those proportions shift in one direction or another' (2013a, n.p.). In this book, I intend to examine if these proportions shift in the context of the move from analogue to digital production frameworks in the context of Indian cinema that often conventionally depends on 'telling' rather than 'showing' advocating for a more complex diegetic model of storytelling. However, there is a recent shift. I will argue that with contemporary digital sound techniques, the pro-filmic spaces in Indian films appear more present, being spatially wider, more elaborate and fluid compared to the screen-centric monaural soundtrack or the flat surface of the stereophonic composite soundtrack. The digital realm's sound practice has incorporated the multi-track synchronized sound recording and surround spatialization of sounds in a more mimetic process of representation, showing locations with intricate details, instead of employing other overly controlled ways of narrating, as if 'holding a mirror to...nature' (Dumouchel, 2015, p. 51), particularly in indie films. It is no surprise that the sites appear mimetically

more present in the digital era in Indian cinema than in previous eras of sound production, as it has become possible to render ‘sounds with an increased exactness’ (Beck, 2008, p. 72). In this book, I locate a shift occurring in Indian cinema from the diegetic to the mimetic as we move from the analogue to the digital, producing an intensified sensation of realism.

Sonic realism, presence, auditory spatiality, and situated-ness

The idea of sonic realism is very much connected to the notion of ‘presence’, which is understood as the degree to which a medium can generate a seemingly accurate reproduction of objects, events, and space – representations that look, sound, and/or feel perceptually real. Mary Ann Doane claimed that ‘concomitant with the demand for a lifelike representation is the desire for “presence”, a concept which is not specific to the cinematic soundtrack but acts as a standard to measure quality in the sound recording industry as a whole. The term “presence” offers a certain legitimacy to the wish for pure reproduction’ (1985, p. 163). The word ‘pure’ as Doane uses it denotes a desire for a natural, extant, and genuine registering of the sound in the recording. Doane made this reflection on presence before the arrival of digital technology in sound recording, a new realm that not only complicates but also supports her statement. I have pointed out (2021a) that her conceptualization of presence was based on analogue optical or magnetic sound recording practices. In the digital realm, presence gains currency in the digital sound system’s capacity to produce the ‘complete sonic environment’ (Kerins, 2006), presenting more detailed sonic information from the location and surrounding the audience member in a spatially richer perspective in terms of frequency and dynamic ranges – as evident in contemporary Indian films made since digital innovations from 2000s (e.g., films made for multiplexes or OTT platforms).¹⁵ These films tend to create an ‘immersion in the filmic environment – audiences are, ...aurally, literally placed in the middle of the action’ (Kerins, 2006, p. 44). In current sound research, presence is defined as the ‘feeling of being present’ (Reiter, 2011, p. 174), as the ‘perceptual illusion of nonmediation’ (Lombard and Ditton, 2006, p. 9), even in studio-constructed experience. These interpretations of presence suggest a tendency towards the mimetic representation of sound in film. In the digital production of the contemporary cinematic environment in India, the pro-filmic space appears

15 An OTT (over-the-top) platform is a Web-based media service offered directly to viewers via the Internet, such as Netflix, Hulu, Amazon Prime Video, bypassing the conventional cable network, broadcast systems, and satellite television channels.

with an intensified sense of sonic realism particularly due to the inclination to employ digital sync sound techniques and methodologies. As I noted in *The Auditory Setting* (2021a), this notion of presence helps to explain how audiences experience a feeling of ‘being there’ bodily, or ‘participating in’ rather than ‘observing from outside’. In this book, I will demonstrate how an aesthetic of ‘spatial fidelity’ (Kerins, 2011) pervades in the digital realm. This notion of spatial fidelity operates closer to ‘spatial realism’ (Altman, 1994) and aural situatedness as opposed to the term ‘sound fidelity’ that Jonathan Sterne discusses in *The Audible Past* (2003).¹⁶ In Indian cinema, the experience of aural situatedness is re-emergent as we read the trajectories from the earlier dubbing era to the digital era. However, this book will locate how such a sense of aural situatedness was also found in the talkies of the direct sound era when all dialogue, songs, ambience, and incidental effects were recorded directly on the optical film during the performance, roughly in the 1930s–1940s. Drawing attention to the spatial fidelity of the recording capabilities inherent in the digital systems – as do Kerins, Sergi, and Holman – I emphasize the spatial faithfulness and lifelikeness that digital sound production provides in Indian film and media works.¹⁷

This book asks the question whether all the subtler aspects of the acoustic worlds of the urban and rural sites of India are narrated truthfully and mimetically even within the flexible and inclusive palette of digital sound production in Indian cinema. In most cases, the noisy aspects of the sound recordings are often controlled and sanitized by editing and advanced noise

16 As Sterne suggests, sound fidelity is a social construct and a social choice. The preference for a ‘better’ sound here hinges on the predominantly social and cultural aspects of sound reproduction. He questions the general assumptions about digital audio to be lacking in life and naturalness, arguing that ‘digital recordings have as legitimate a claim on sonic experience as their analogue counterparts’ (Sterne, 2006). The sound practitioners I interviewed for my research seem not to agree: while analogue sound is seen as warm and human-like, digital audio, in their opinion, is cold and clinical. Their opinion can be based on a social sense of nostalgia and loss due to the large-scale and revolutionary conversion of the filmmaking process in India from analogue to digital since the 2000s. A more detailed explanation of the term fidelity can be found in *The Auditory Setting* (2021a).

17 Later in the book, I will show and discuss in detail that digital sound recording and production frameworks in India have introduced a number of creative possibilities, including a significantly larger dynamic range, which is a fourfold improvement over the monophonic and almost double that of the stereophonic format; a larger headroom – a major improvement over both the monophonic and stereophonic formats; discreet channels for multi-channel systems, like Atmos; wider panning for sound spatialization; and full-frequency channels with a consistently flatter response than any analogue counterparts. These technical improvements, I argue, contribute to faithful recordings made on location and faithful-to-original sound design deployed in the studio. These claims are substantiated by discussion with Indian sound technicians.

reduction techniques to provide cleaner sounds.¹⁸ The typically syncretic, chaotic, and inchoate structures of Indian cities are reflected in the multiple layers of sounds from pre-industrial, industrial, and post-industrial eras, simultaneously active in juxtapositions or in contrapuntal relationships with one another. The urban sound environment in most Indian metros is therefore overly noisy, and sonically overwhelming and disorienting for the listening subject (Chattopadhyay, 2014, 2020, 2021a). This amount of noise is not always heard in the augmented sonic environment of Indian films, where more sanitized and gentrified accounts of these sites are presented. This spatial atmosphere can no longer be understood as a linear and one-dimensional 'soundtrack', rather it might be called a 'sonic environment' or an evolving 'cinematic soundscape'. I have discussed in *The Auditory Setting* (2021a) that the notion of soundscape as postulated by Murray Schafer aims 'to draw attention to imbalances which may have unhealthy or inimical effects' (1994, p. 271). This 'moralizing' (Kelman, 2010; LaBelle, 2006) tendency applied to controlling the incoming ambience by means of 'acoustic design' strongly corresponds with the 'sound design' deployed in cinema in general, even in contemporary Indian cinema of the digital era, involving editing and advanced noise reduction. The underlying intention is to transform 'lo-fi' sounds into 'hi-fi' sounds, removing 'noise' contents while prioritizing the potential entertainment and enjoyment of audience members. According to Schafer, 'lo-fi' sounds are 'overcrowded, resulting in masking or lack of clarity' (1994, p. 272); they have a lower signal-to-noise ratio and tend to impose 'an increased level of disturbance upon the body, society and the environment' (LaBelle, 2006, p. 202). This compulsion of achieving clarity in the cinematic soundscape trading off mimetic truthfulness leads the Indian sound practitioner to often use sporadic 'soundmarks'¹⁹ instead of accurately capturing the sounds present at the cinematic location, as I will argue in this book. This tendency to underline a particular sound, often at the expense of many other site-specific sound elements emanating from a specific site, intends to sonically compensate for the noise reduction and the editing of many sync sound layers in post-production.²⁰ These film

18 For an elaboration of this statement, please refer to the interviews with Indian sound editors and sound designers in my book *Between the Headphones* (2021b).

19 According to Schafer, a soundmark is 'a community sound which is unique or possesses qualities which make it specially regarded or noticed by the people of that community' (1994, p. 10).

20 'Post-production' is work done on a film (or recording) after filming or recording has taken place. In post-production stages, the editing, processing, designing, spatial organization, and mixing of sound are performed.

industry norms, practical rules, and film production regulations embedded in the essentially functional aspects of film sound creation in India often tend to thwart the artistic potential of the sound practitioner, keeping the practice away from enriching the film's fuller auditory spatial experience.

Sound Methodologies

Historical outlining and locating sonic transitions

In three respective subchapters of the book's second chapter, I will examine the nature of sound usage in various corresponding and intercepting phases of sound production in India: 1) direct optical recording (monaural), synchronized sound; 2) analogue magnetic recording, dubbing, monaural and stereophonic mixing; 3) digital sync recording, surround design and mixing. Critical listening and reflective analyses of film and audiovisual media in the later chapters will follow this historical outlining.

I have already observed that sound has been inconsistently rendered and produced through various phases of Indian production practices. I mentioned earlier that there have been phases of sound practice in Indian cinema, such as the entire 'dubbing era' (1960s–1990s) that cared little about the site, giving more importance to typical 'song and dance' sequences. However, there are also phases such as the 'digital era' (2001–) where the realistic and concrete representation of site is observed. The dominant factors that have determined these shifts are assumed to be rooted in technological developments in film sound as film scholars point out in the context of American cinema (Kassabian, 2013a; Kerins, 2011; Lastra, 2000; Altman, 1980). These perspectives are valid for Indian cinema too. Certain aesthetic choices were made available by these technological changes shaping up the historical evolution of sound practice in Indian cinema. Questions can be raised about whether cinema technology influences aesthetics in filmmaking and whether this assumption is technologically deterministic. In defence, I argue that technological innovations do not necessarily determine production aesthetics, but they facilitate certain options and aesthetic choices that the practitioners choose as their tools and methods. This argument is substantiated by Mark Kerins in his book *Beyond Dolby*, where he claims that film history is rich with examples of 'technology influencing aesthetics' (Kerins, 2011, p 54). For example, the emergence of sound, colour, and magnetic tape initiated deep changes in corresponding aesthetic features in cinema; magnetic recording paved the

way for the asynchronous mode of sound reconstruction in India cinema (e.g., dubbing and ADR). As I have noted (2021a), film scholar Rick Altman also articulated the implications of sound technology on cinema in his seminal writings (1980, 1992) arguing that sound technologies shaped certain aesthetic practices in Hollywood.

For the purposes of historicization, the book divides the trajectories of sound practice in India into three prominent markers primarily based on aesthetic shifts informed by technological innovations and related changeovers. I have assumed that the digital sound system produces a different experience than that of the earlier generation of mono or stereophonic environments with dubbing and Foley replacing the original recordings made on location. These earlier processes of post-synchronization, heavily compromised by the spatial characteristics of sounds, were perceived less dynamically and with relatively less depth, and the delicate relationship between sound and space in Indian cinema varied substantially from one setting to another. This trajectory of the use of sound in Indian film and audiovisual media works needs to be studied historically to understand how sound adds to the sense of verisimilitude and presence while constructing the film space and other mediated environments. Therefore, I divide sound production practices into three primary phases: namely, optical monaural direct recording era (1930s–1950s); the magnetic recording and dubbing era (1960s–1990s); and contemporary digital multi-track location sync sound and the surround design era (2001–present). Questions can be raised as to whether these three historical markers as a loose tri-partite model are historically accurate, or if perhaps they limit the scope of the research. I would argue that the loosely based three-part division is a heuristic – a pragmatic and useful portal to read the fragmentary, uneven and often intercepting trajectories in a largely historical context. There are other various shifts that occur in parallel or intersect at a certain point, but the choice of these three prominent and predominant phases makes it easier to understand the practice of sound in Indian cinema in a coherent and comprehensive manner. This loose division also reflects the practical discourse of sound practitioners – in their vocabulary,²¹ the various historical phases, as we see in their conversations, are named in similar nomenclatures such as ‘direct sound era’, ‘mono era’, ‘dubbing era’, and ‘digital era’. Likewise, the tri-partite model works as a convenient lens to examine developments in the way sound is practiced in trajectories of Indian cinema, altering sonic and spatiotemporal experiences.

21 See interviews with sound practitioners in *Between the Headphones* (2021b).

Critical listening to film examples

After this historical outline, the later part of the book is devoted to a descriptive analysis of various modes and facets of sound production in Indian film and audiovisual media, ranging from mainstream popular Hindi language films made in Mumbai to regional cinemas in Bengali, Malayalam, and Tamil languages among others, as well as other various creative media productions. This comprehensive overview of sound production practices will be contextualized in the light of film and media production studies, the phenomenology of sound and listening, and sound studies via a critical listening to relevant film and audiovisual media examples as case studies.

A practice of attentive listening to film examples helps the examination of the trajectories of sound practice in Indian films and conceptualizes the use of sound since the advent of talkies to the contemporary digital realm. By studying and analyzing a number of film and media works produced in India from different technological phases of sound recording and design, the book establishes three corresponding models that are developed on the basis of historicizing sound practice and shifting sonic aesthetics in Indian cinema. These analytical accounts aim to critically engage with the conceptualization and realization of a creative practice with sound by way of squarely focusing on the film sound experience. The investigation makes a phenomenological survey of the sonic experience while making connections between various components of sound, from voice to sound effects and ambience. As methodology, this book doesn't focus on film music per se, though occasionally makes comments when songs or background music are intertwined with other creative layers of designed sound. More focused discussions on the uses of songs and music in Indian cinema can be found in other scholars' work (Booth and Shope, 2013; Morcom, 2016; Mukherjee, 2007; Arnold, 1991). This book addresses basic questions around the choice of sounds in significant sequences from Indian film and media works carrying narrative information and evocative nuances, re-ordering and positioning sound creatively to construct the mediated sonic environment. The book also tries to define aesthetic choices in the communication and cognition of sound in relation to film and media. The discussion and theorization by sound analysis deals with narrative discourses that arise from the different strategies of converging sound and moving image, as well as mixing particular sounds with other related sound components to make meaning. These analyses take their point of departure from specific phases of technological transitions and intend to highlight characteristics defining the sound aesthetics that emerge from these different phases of

sound practice. The listening approach furthermore seeks to trace out the emergent aesthetics within theoretical frameworks of practice-led sound studies.

These analyses of film examples through different phases of cinematic sound practice aim to probe whether Indian films and media productions have shifted audio-audio and audiovisual relationships away from maintaining the merely vococentric contract of an early cinema soundtrack towards the spatial practice of a sonically present environment evident in digital production, in which the spectator's association with the film space is increasingly instigated by the spatial re-ordering of creative sound layering. This argument is substantiated by experiencing, examining, and dissecting a number of representative film and media works as case studies from three primary technological phases: analogue optical direct recording and mono-aural mixing; analogue magnetic recording, dubbing, and stereophonic mixing; digital multi-track sync recording and surround sound design. The selection of films discussed here as case studies cover a wide range of empirical materials for discussion, from the realist works of Indian auteur Satyajit Ray (1955–91) to the Indian indies as mentioned earlier (e.g., the contemporary Indian films of Anurag Kashyap and Dibakar Banerjee that are shot using digital sync recording imbibing a realistic approach to sound). Ray's entire oeuvre has been considered in terms of the agency of realism in the early monaural setting of Indian cinematic sound, revived in indie films. Further, a great number of relevant films from the analogue optical, analogue magnetic, and digital eras are referred to in order to locate specific characteristics of creative sound practice in the respective phases. Among audiovisual media works, projects that creatively incorporate sound are discussed in the light of current scholarships. Citing many examples from representative films and media works for critical listening, descriptive analysis, and scholarly reflection, the book provides an entry into the complex, fascinating, and ever-evolving sound world of Indian film and media, composing a valuable scholarly contribution.

Auto-ethnographic intervention

Correspondingly, this book learns about the nitty-gritty of sound production through in-depth conversations with prominent Indian sound practitioners as first-hand documentation of what has been achieved in sound use. This grounded knowledge works as a prerequisite in understanding how the *mise-en-sonore* (Chattopadhyay, 2021a) or auditory setting is produced in Indian film and media. A discussion of the practice with a claim that sound

production with digital technology has impacted cinematic experiences is thus based in solid empirical evidence. The conversations with the sound practitioners working in India are useful to enrich the bottom-up research of the book and ground it in the practical worlds of sound production in Indian film, audiovisual media, and the creative industries. These edited and collected interviews are published in a separate book *Between the Headphones: Listening to the Sound Practitioner* as a reference volume (Chattopadhyay, 2021b).

The conversations therein are based on a specific set of semi-structured and open-ended questions about the handling of sound from recording to design and how technology impacts these production processes. In the book, I discuss my dialogic approach to derive knowledge from practitioners about the intricate sound production process in detail. These are in-depth conversations rather than mere interviews from an outsider's position; an auto-ethnography approach is embraced, as I am a sound practitioner myself. These friendly conversations often depart from a set of semi-structured and open-ended questions to become candid dialogues navigating anecdotal evidence about production processes. According to scholars of qualitative research Jody Miller and Barry Glassner, semi-structured and open-ended interviews may solicit 'authentic accounts of subjective experience' (2011, p. 131). I have shown in *Between the Headphones* (2021b) that this approach helped the sound practitioners 'to speak in their own voices about their art and craft' (LoBrutto, 1994, p. 1). Sound Studies scholar Mark Grimshaw asserts that a questionnaire-based qualitative approach involving semi-structured interviews 'allows the interviewer a certain level of control which directs the interviewee down particular paths. Equally it allows the interviewee to expand on themes outside the limits of the questions, which can reveal unexpected information' (2011, p. 54). The dialectics between the top-down approach of reflective analyses and the bottom-up approach of learning from the practitioners themselves thus form the backbone of this book's research, ensuring that 'even the more abstract notions about filmmaking and cinema remain grounded in real-world practices' (Kerins, 2011, p. 10). Employing the approach of sonic auto-ethnography means that a self-reflective moment is helpful in unpacking the sound production stages and their intertwining histories and aesthesis. These illuminating inputs and evidential accounts, occasionally referred to from my other book *Between the Headphones* (2021), enriches this research monograph with practical insights based on the rudimentary aspects of the real world of sound production. This empirical evidence sheds light on India's normative modes of cinematic sound production and distribution chains. For example, according to one of the sound

practitioners,²² one reason for not using sync sound earlier had been the working structure within the Indian film industry, based on the stardom and inflexible power hierarchies and structural inequalities embedded in the systems in place. With the advent of digital technologies, sync sound started to require the overvalued actor's complete participation on the film set on an equal footing with the location sound technician, who has long held a lower status in film crew hierarchy. According to this empirical evidence, the introduction of digital technology has opened up scope for a more creative sound practice that not only has substantially changed the sonic experience but also realigned the hierarchy of the film crews, making the role of sound practitioners more significant and indispensable in India's new audiovisual environments.

Chapter Overview

The book is divided into 13 chapters, including this introduction. Most of the chapters contain sub-chapters with specific detail and in-depth discussion.

The introductory chapter divides sound production practices in Indian film and media into three primary phases. Critically listening to the trajectories of sound production and drawing ideas from current research in sound and music in Indian cinema (Booth, 2011; Morcom, 2016 et al), an observation is made that sound has been rendered in manifold methodologies and produced through various phases of production practices because of technological innovations and shifts. The dominant factors that have determined these shifts are rooted in technological developments (Kassabian, 2013; Kerins, 2011, 2006; Lastra, 2000; Altman, 1992). Certain aesthetic choices were made available by these technological phases – a process that shaped the historical evolution of sound practice in India. In this chapter, the historical trajectories are studied to understand the various differing and concurrent practices, methodologies, and approaches, as well as the shifts in recording and organizing sound for the purpose of audience engagement.

I divide these trajectories into three primary historical markers that seemed useful while locating and mapping the foremost technological shifts. I study how these shifts have become manifest in the emerging aesthetic choices available to and embraced by sound practitioners and how these choices are reflected in the production of a site's sonic presence. In other

22 See: interview with Anup Dev in *Between the Headphones* (Chattopadhyay, 2021b).

words, the various forms and formats of technological innovations and transformation have informed the usage of specific sound components. Therefore, my central concern is to study the specific nature of sound's usage in these corresponding and intercepting phases of recording and sound production in India: the analogue monaural synchronized sound recording (direct optical on location) and monaural mixing; dubbing, studio processed, and stereophonic mixing; digital multi-track synchronized recording and surround sound design. Critical observation, reflection, and analysis of the passages of sound from representative Indian film and audiovisual media works, specifically from these three different phases of sound production, are made. In light of the above, this book sets out to challenge the traditional reading of Indian cinema as producing mostly song and dance sequences. Questions might be raised as to whether this broad historical overview suffers from not being able to adequately delve into a focused and detailed discussion of a particular era. In its defence, I refer to the argument of certain film and media historians who maintain that writing history demands a broader perspective in order to accommodate historiographical accounts (Tybjerg, 2013). Emerging from a void of serious and sustained research on sound in the Indian films, this book could be viewed as creating a reference volume for future research that might present more detailed studies of particular periods of sound production. Moreover, the project is inspired by my own professional background as a sound practitioner. My academic experience in the historical developments of sound in Indian film and media arts help to open up the research to make new ranges of generative knowledge.

The second chapter historicizes the technological trajectories of film sound production from direct sound of early Indian cinema via the coming of magnetic recording and the primacy of dubbing to the advent of digital technology in film sound since 2000s, incorporating practices like sync sound recording and surround design.

The third chapter traces the various modes and facets of sound production in Indian cinema during the early talkies practicing direct sound. This chapter delineates the evolution of sound in Indian cinema from the silent era to sound film. Starting with the use of sound in early Indian talkies, such as *Bombay Talkies* (1934–53), the chapter elaborately describes the development of 'direct sound' and the resultant linguistic divisions in Indian cinema by analyzing a number of monaural works.

The fourth chapter studies sound in the so-called Golden Age of Indian cinema, when the quality and quantity of production sky-rocketed and reached a global stage.

The fifth chapter develops a careful study of the works of filmmaker Satyajit Ray. His work with sound is analysed to conceptualize what I term 'audiographic realism': a coinage that emphasizes the realistic sound elements recorded and incorporated in the monaural rendering of cinematic sound produced in this era. This chapter is an edited and reworked version of my article 'The World Within the Home: Tracing the Sound in Satyajit Ray's Films' published in *Music, Sound, and the Moving Image* (2018).

In the sixth chapter, I discuss the so-called 'dubbing era' from roughly the 1960s to the late 1990s. Many representative popular films from this era are examined to develop a basic argument that the creative practice of designing sound in Indian films of this period incorporated a technologically informed approach, using analogue sound processing with expressionistic and melodramatic overtones to cause the spectator to imagine film space instead of bodily experiencing it in film sound production. Parts of this chapter appeared previously in an edition of the *New Soundtrack Journal* entitled 'The Auditory Spectacle: Designing Sound for the 'Dubbing Era' of Indian Cinema' (2015).

In the seventh chapter, I critically discuss sound practices and sonic aesthetics through strands of the parallel film movement in India, focusing on the works of pioneering auteurs such as Mrinal Sen, Ritwik Ghatak, Mani Kaul, Shyam Benegal, Adoor Gopalakrishnan, G. Aravindan, Buddhadeb Dasgupta, Goutam Ghose, and Rituparno Ghosh, among others.

In the eighth chapter, following film analysis and finding actual evidence in conversation with sound practitioners, I demonstrate that stereophonic mixing, as an extension of magnetic recording and dubbing practices, rendered the cinematic imagination of this period as something spectacular, with extravagant songs and dances in exotic locations and action-filled scenes packed with studio-manipulated and synthetic sound effects. Add to this a deliberate lack of ambience, and this practice triggered a cinematic experience of emotive tension and affective stimulation.

In the ninth chapter, I study the advent of digital sync sound and the resultant (re-)emergence of spatial awareness in Indian cinema post-2000, termed the 'digital era'. Since the late 1990s, a large-scale conversion from analogue recording and analogue production practices to digital technologies has taken place in Indian cinema. Digital technology has been integrated into the production and post-production stages of filmmaking, as well as reproduction and projection formats. The ramifications of cinema adapting to a new technology have been far-reaching, particularly as a result of novel digital sound practices in Indian cinema. Production practices and techniques, such as location-based, multi-track synchronized recording and

surround sound spatialization, altered the notion of the film soundtrack in the contemporary digital realm of Indian cinema. This subchapter carefully studies how the processes of digitalization made a substantial impact on the narrative strategies and aesthetic choices of extant cinematic sound production, informing the creation of the presence of a site in the film space by novel modes of interplay between quasi-diegesis and mimesis.

The tenth chapter expands the discussion of the digital realm of sound production in Indian cinema towards the surround revolution. It discusses representative films using spatial audio from 5.1 to the present era of Dolby Atmos, studying the site-specificity and spatial awareness such films encourage. An earlier version of this chapter appeared in an edition of *Journal of Sonic Studies* entitled 'Being There: Evocation of the Site in Contemporary Indian Cinema' (2016).

The eleventh chapter is dedicated to the study of the creative practice of sound in other audiovisual media art productions such as interactive installations, works for digital media arts, and sound arts. Several artworks, projects, and initiatives are discussed.

The twelfth chapter starts with a discussion of feminist filmmakers in India and their contributions. The chapter then elaborates on the independent films of the digital era, termed the 'Indian indies', following the so-called 'parallel cinema' and its inclination toward audiographic realism expanded with the use of sync sound and location recordings. Later, the chapter makes a critical overview of the use of sound in documentary, shorts, experimental, and art-house cinema genres of India and regional films. The aim is to examine the processes of sound recording and design, and the modulation of the reality, widening the scope of experimentation in sound and audiovisual media.

Based on an in-depth and historical enquiry made into the various threads of sound production in India – by means of critical listening, descriptive analysis, and informed commentaries – in the thirteenth and final chapter, I consolidate the content and the context of the book and its focus on the uniqueness of sound practice in India, its historical trajectories, as well as aesthetic shifts by formulating concluding remarks. As already discussed throughout the book, Indian cinema – with its diverse fields of practices, productions, and experiences – is arguably the world's largest producer of films. It is also an emerging giant in producing a diverse range of other audiovisual media content. It is the intention of this chapter to locate the dominant tendencies and predilections of this diversity with a practice-aware approach. This approach is driven by the methodologies of critical and self-reflective observation, pursued through a number of the complex and

intercepting threads of production trajectories in a vastly heterogeneous national cinema, loosely unified by technological and aesthetic developments. Being a sound practitioner myself, my critically observational and reflective approach helps to creatively locate the major historical developments in the practice of sound, which is in itself an underexplored subject in film history and media studies, and screen music research, as well as within the emerging field of sound studies. My aim is also to facilitate a study of film sound that questions the classical assumptions of the sound-image relationship and shift the focus towards the presence of the diegetic space and mediated universe as a vital narrative and creative component. I have devised a taxonomical model based on critical observations of historical and technological shifts and emergent aesthetic strategies. This model's point of departure is found in specific phases of technological innovations and transitions in sound production but is not limited to a discussion of the history of sound technology. On the contrary, the model highlights characteristics delineating sonic aesthetics emerging from these prominent technological phases, thereby linking various modes of sound practice with the varied fields of film and media studies, as well as screen music production.

References

- Altman, R. (ed.) (1992). *Sound Theory/Sound Practice*. New York: Routledge.
- Arnold, A. (1991). *Hindi filmī gīt: On the History of Commercial Indian Popular Music* (Ph.D. Dissertation). Urbana-Champaign: University of Illinois.
- Biancorosso, G. (2009). "Sound". In Plantinga, C.R and Livingston, P. (eds), *The Routledge Companion to Philosophy and Film* (pp. 260–267). London: Routledge.
- Blessner, B. and Salter, L.R. (2009) *Spaces Speak, are you Listening?: Experiencing Aural Architecture*. London: The MIT press.
- Bloom, Peter J. (2014). "Sound Theory," in Edward B. and Warren B. (eds), *The Routledge Encyclopedia of Film Theory* (pp. 430–434). London and New York: Routledge.
- Booth, Gregory D. and Shope, B. (eds) (2013). *More Than Bollywood: Studies in Indian Popular Music*. New York: Oxford University Press.
- Born, G. (ed.) (2013). *Music, Sound and Space: Transformations of Public and Private Experience*. Cambridge, U.K.: Cambridge University Press.
- Branigan, E. (1989). "Sound and Epistemology in Film". *The Journal of Aesthetics and Art Criticism* 47(4), 311–324.
- Bull, M. (2018). *The Routledge Companion to Sound Studies*. Abingdon, Oxon; New York, NY: Routledge.

- Chattopadhyay, B. (2007). "Sound Memories: In Search of Lost Sounds in Indian Cinema". *Journal of the Moving Image* 6, 102–111. Jadavpur: Jadavpur University press.
- Chattopadhyay, B. (2014a). "Object-Disoriented Sound: Listening in the Post-Digital Condition". *A Peer-reviewed Journal About* 3(1). www.aprja.net/?p=1839 (accessed 13 April 2023).
- Chattopadhyay, B. (2016). "Being There: Evocation of the Site in Contemporary Indian Cinema". *Journal of Sonic Studies* 12. <https://www.researchcatalogue.net/view/286592/286593> (accessed 12 September 2023).
- Chattopadhyay, B. (2017). "Reconstructing Atmospheres: Ambient Sound in Film and Media Production". *Communication and the Public* 2(4) 352–364. London: SAGE Publication.
- Chattopadhyay, B. (2018). "Orphan Sounds: Locating Historical Recordings in Contemporary Media". *Organised Sound* 23(2), 181–188. Cambridge: Cambridge University Press.
- Chattopadhyay, B. (2021a). *The Auditory Setting: Environmental Sounds in Film and Media Arts*. Edinburgh: Edinburgh University Press.
- Chattopadhyay, B. (2021b). *Between the Headphones: Listening to the Practitioner* (2021b). Newcastle upon Tyne: Cambridge Scholars Publishing.
- Chion, M. (1994). *Audio-vision: Sound on Screen*. Translated and Edited by Gorbman, C. New York: Columbia University Press.
- Dyson, F. (2009). *Sounding New Media: Immersion and Embodiment in the Arts and Culture*. California: University of California Press.
- Gopalan, L. (2002). *Cinema of Interruptions: Action Genres in Contemporary Indian Cinema*. London: British Film Institute.
- Ganti, T. (2012). *Producing Bollywood: Inside the Contemporary Hindi Film Industry*. Durham, North Carolina, United States: Duke University Press.
- Hayward, S. (2006). *Cinema Studies: The Key Concepts*. London: Routledge.
- Ihde, D. (2007). *Listening and Voice: Phenomenologies of Sound*. New York: Sunny Press.
- Jordan, R. (2012). "The Ecology of Listening While Looking in the Cinema: Reflective Audioviewing in Gus Van Sant's *Elephant*". *Organised Sound* 17(3), 248–256.
- Kassabian, A. (2013). "The End of Diegesis as We Know It?" In John Richardson, Carol Vernallis, and Claudia Gorbman (eds), *The Oxford Handbook of New Audiovisual Aesthetics*, pp. 89–106. Oxford: Oxford University Press.
- Kerins, M. (2011). *Beyond Dolby (Stereo): Cinema in the Digital Sound Age*. Bloomington: Indiana University Press.
- Kerins, M. (2006). "Narration in the Cinema of Digital Sound". *The Velvet Light Trap* 58 (Fall), 41–54.

- Kaul, M. (1977). "Communication". Symposium on THE CINEMA SITUATION, with Kumar Shahani, Adoor Gopalakrishnan, Shyam Benegal and Dileep Padgaonkar. https://theseventhart.files.wordpress.com/2011/07/the-cinema-situation_74.pdf (accessed 4 July 2022).
- Kaul, M. (1983). "Towards a Cinematic Object". *Indian Cinema Super Bazaar*. https://theseventhart.files.wordpress.com/2011/07/towards-a-cinematic-object_mk.pdf (accessed 4 July 2022).
- Kaul, M. (1991). "Seen from Nowhere". In Vatsavan, Kapita (ed.), *Concepts of Space: Ancient and Modern*. New Delhi: Abhinav Publications.
- LaBelle, B. & Martinho, C. (eds) (2011). *Site of Sound: Of Architecture and the Ear: Vol 2*. Berlin: Errant Bodies Press.
- Lastra, J. (2000). *Sound Technology and the American Cinema: Perception, Representation, Modernity*. New York: Columbia University Press.
- Morcom, A. (2016). *Hindi Film Songs and the Cinema*. Farnham, UK: Ashgate Publishing.
- Mukherjee, M. (2007). "Early Indian Talkies: Voice, Performance and Aura". *Journal of the Moving Image* 6, 39–61. Kolkata: Jadavpur University Press.
- Nancy, J. L. (2007). *Listening*. Translated by Charlotte Mandell. New York: Fordham University Press.
- Pinch, T. and Bijsterveld, K. (2013). *The Oxford Handbook of Sound Studies*. Oxford: Oxford University Press.
- Rajadhyaksha, A. (2007). "An Aesthetic for Film Sound in India?" *Journal of the Moving Image* 6. https://www.jmionline.org/article/an_aesthetic_for_film_sound_in_india (accessed 7 September 2023).
- Ray, S. (1976). *Our Films, Their Films*. Delhi: Orient Blackswan.
- Ray, S. (2011). *Satyajit Ray on Cinema*. Edited by Sandip Ray. New York: Columbia University Press.
- Rogers, A. (2013). *Cinematic Appeals: The Experience of New Movie Technologies*. New York: Columbia University Press.
- Sterne, J. (2012). "Sonic Imaginations". In Sterne, J. (ed.), *The Sound Studies Reader* (pp. 1–17). London: Routledge.
- Sterne, J. (2006). "The Death and Life of Digital Audio". *Interdisciplinary Science Reviews* 31(4), 338–348
- Sterne, J. (2003). *The Audible Past: Cultural Origins of Sound Reproduction*. Durham: Duke University Press.
- Théberge, P., Devine, K., and Everett, T. (2015). *Living Stereo: Histories and Cultures of Multichannel Sound*. New York: Bloomsbury.

