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The Elephant in the Baithak: Tabla and Audio Technological Discourse

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Abstract

This thesis discusses how power, status, and performance practices play out between performers of *tabla* (North Indian hand drums) and audio engineers. To do so, I analyze engineer, performer, and music critic discourse surrounding *tabla* performances and technology to place it within a broader scholarly debate regarding recording technology, cultural/technological capital, technological determinism, and agency. I extend Christopher Scales's (2012) concept of "recording culture" to "live sound culture," or the behaviors, power struggles, and labor surrounding *tabla* mic'ing and amplification. I argue that audio technology separates the artist's sound into several domains of control (stage, hall, recording, playback), each controlled by various human and non-human actors. These multiple sound fields produce various disruptions in collaboration between performers and engineers but also the opportunity for co-construction of sound and meaning.

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by

Tyler Thom

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Abstract

This thesis discusses how power, status, and performance practices play out between performers of *tabla* (North Indian hand drums) and audio engineers. To do so, I analyze engineer, performer, and music critic discourse surrounding *tabla* performances and technology to place it within a broader scholarly debate regarding recording technology, cultural/technological capital, technological determinism, and agency. I extend Christopher Scales's (2012) concept of "recording culture" to "live sound culture," or the behaviors, power struggles, and labor surrounding *tabla* mic'ing and amplification. I argue that audio technology separates the artist's sound into several domains of control (stage, hall, recording, playback), each controlled by various human and non-human actors. These multiple sound fields produce various disruptions in collaboration between performers and engineers but also the opportunity for co-construction of sound and meaning.

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Chapter One: Introduction

The Drum and the Microphone

> What is the precise place of the microphone in our classical music? Someday quite soon someone will have to get down seriously to answering that question […] it is not too many years since the exponents of Indian classical music have begun to be confronted with audiences vast enough to demand the use of a 'mike.' (*The Times of India* 1958, 5)

> The microphone has for long been an inseparable part of music concerts and other varieties of stage entertainment. Indeed, the listeners' ears are now so inured to the ubiquitous gadget that music without a mike is simply unthinkable. (Nadkarni 1992, 8)

The quotes above provide a glimpse into the breadth and extent of discussion among engineers, music critics, performers, and theorists revolving around Hindustani classical music and technology. Many early critics held a disdain for technology as antithetical to tradition, while others heralded sound amplification and recording technologies. In the case of the *tabla,* South Asia's most prominent hand drums, these technologies have been argued as being key to the development of different performance techniques and the rise in the worldwide popularity of the *tabla,* while simultaneously disrupting pedagogical practices and socio-musical statuses. This paper addresses the broad question of how *tabla* players discuss sound amplification technology and how this discourse informs negotiations of status, power, tradition, and performance practice. To address these issues, I have analyzed interviews I conducted with performers and engineers in India and the United States and published interviews. I have also consulted archival documentation of concert reviews, coded blog posts and forums, and put into

dialogue discussions of live performance technology in India with the broader scholarly literature on recording technology. My analysis demonstrates how power and status play out in the technological domain between performer and engineer or performer and performer by discussing the changing role of *tabla* performers and audio technological practices from the inception of audio recording technologies in India to current times. Discussing *tabla* in the realm of audio technology further demonstrates how an aesthetic preference for the voice in Hindustani classical music marks the *tabla* not as a percussion instrument, but as an emulation of the voice.

Much has been written in terms of *tabla* pedagogy, lineage, performance practice, and interpersonal relationships, but often audio technology is absent from this discussion. Denise Nuttall (2011) discusses the growing use of the internet and video conferencing software in disseminating *tabla* performance practice. Nuttall expands on Appadurai's theory of global movements of people and things by introducing the concept of "tablascape" as a transnational flow of Hindustani music (2011, 19). Other writers have discussed the growing phenomenon of the "internet guru" and the plethora of amateur and expert *tabla* performers ready to share compositions, techniques, and information online (Roy 2016). The audio quality of these offerings can range from expertly recorded videos in state-of-the-art studios to amateur home recordings hastily produced with the use of a smartphone recorder. How are these encoded and decoded sounds conceptualized and understood in altered and reimagined spaces? The sounds produced by these performers are encoded by music recording/amplification devices with varying degrees of transparency; they are further decoded by the listeners' varying knowledge of *tabla* performance practice and through the quality of the decoding equipment — screens and

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speakers or headphones with varying levels of quality that enable degrees of fidelity to the original recording. The sound's mediation by audio technology creates a separation of control into several domains of listener, musician, and engineer agency. These new domains are manifest in spaces such as stage versus audience/hall or recording studio versus place of audio playback.

Musicians, audio engineers, and audio technology companies often discuss recording equipment in terms of transparency, in which a sound is considered "clear" or "faithful" if it is encoded and later decoded without a loss in fidelity. However, space, location, tradition, and representation are not always accurately transmitted along with the "faithful representation" of the original, even in the seemingly instantaneous realm of live sound engineering. This is not to say that the decoded audio heard by a listener through a personal playback machine or in a large auditorium has lost its "aura," but rather that the en/recorded and decoded sound is recontextualized through this process of transduction, where "the ontology of music changes in the context of amplification" (Slaten 2018, 23).

This thesis first introduces timbral discourse among *tabla* performers concerning performance practices and performing lineages called *gharānā*s,[1] discusses previous literature on sound and technology in both India and globally, and then provides a discourse analysis of engineers, critics, and performers. Analysis of discourse can contextualize the "live sound culture" of *tabla,* including the behaviors, power struggles,

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[1] The macron symbol above a letter in a Hindi-Urdu word represents an elongation of the vowel sound. The usage of this symbol reduces the unwieldy use of doubled vowels: *gharaanaa* versus *gharānā.* Other sonic distinctions specific to Hindi-Urdu, such as retroflex consonants, are not noted in the transliterations herein. Macrons will be used often, but not in every instance.

and labor surrounding *tabla* mic'ing[2] and amplification. Furthermore, I demonstrate how performers engage with technological capital to assert their claim to power, how the culture around mic'ing and amplifying *tabla* is connected to changes in performance practice, and how status and deference are negotiated through and in response to the control of sound. I argue that audio technology separates the artist's sound into several domains of control (stage, hall, recording, playback), each controlled by various human and non-human actors. These multiple sound fields produce various disruptions in collaboration between performers and engineers but also the opportunity for co-construction of sound and meaning.

Tabla Practice: From Speaking to Battling

The history of *tabla* and its performing practices is disputed due to the lack of extensive written documentation, complex narratives surrounding identity and music, mythologization, and narrative construction by Orientalists and Hindu nationalists. These narratives are intertwined with nation-building politics and communal violence in India where Muslim Ustads (master performers) are seen as perverting what is reimagined as ancient Hindu music (Bakhle 2005). Similarly, many early writings on India are tinged with Colonialist imaginations of the Other that tended to exoticize or imagine South Asia as a timeless and unchanging place, a "golden age" that Orientalists (and Hindu nationalists) desired to trace back to Vedic times.

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[2] Although it is common in spoken English to use the word "mic" instead of "microphone" as a verb, the word can appear awkward in written form. The two standard spellings used are "mic" or "mike." I have chosen to use the former version to avoid confusion with the name. Nevertheless, in other conjugations of the verb, "mic" may appear clunky (ie. "mic'ing" or "mic'ed," the apostrophe is used to avoid further confusion in the form of "miced").

Despite this, many scholars believe that *tabla* first appeared in India during the rule of the Mughals (1520s–1850s), although in an early form of the modern instrument (Bhomick 1979, Gottlied 1998). An often-cited creation story is that of Amir Khusra, a court musician for Sultan Alauddin Khilji (1296–1316), who is said to have cut an hourglass-shaped drum in half to create the two drums that would become *tabla*. However, Robert Gottlieb argues the veracity of this claim, explaining that it is weak due to "the fact that no instruments resembling the modern *tabla* appear in the paintings or sculptures dating from this early period" (Gottlieb 1998, 2). Gottlieb suggests that the drums were "brought to India by the Muslim and Moghul invaders" and suggests that the name *tabla* comes from the Arabic word *tabl*, meaning drum (Gottlieb 1998, 1).

Kedar Nath Bhowmick explains that the "Kanoon-Mausiqi" written by Ustad Sadiq Ali Khan mentions that the drums were created by the performer Sudhar Khan (Bhowmick 1979, 1). The narrative of Sudhar Khan (also Sidhar Khan) creating *tabla* is often echoed by many of the interlocutors with whom I have spoken, even if the dates of his life are often conflated. George Ruckert explains that despite fanciful stories and narratives, "*tabla* began to assume its important role […] in the time of Sidhar Khan (eighteenth century Delhi)" (Ruckert 2004, 46). The typical creation story that is often recited in various forms by musicians, is retold by Ruckert:

> The *pakhāwaj* is a double-headed, barrel-shaped drum, which has a smaller treble and a larger bass end, played by the right and left hands respectively. Two famous *pakhāwaj* players were having a contest, the loser of which was to have his drum split in half - a humiliating defeat. The losing player, traditionally suggested to have been Sidhar Khan of Delhi, took his split drum home, stood the two parts upright, and played them as separate drums. "*Tab bhi bolā*" – "still it speaks!" said onlookers in surprise. (2004, 45–46)

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Despite the prevalence of this story, the veracity remains questionable. Instead, it may simply be an entertaining explanation of the evolution from *pakhāwaj,* which was widespread in earlier performance genres such as *dhrupad*, to the *tabla* that was used in later genres such as the popular *khayāl.*

  Tabla is a set of two drums, a higher-pitched right-hand often made of *sheesham* wood (also known as Indian rosewood) and a lower-pitched left-hand drum made of clay or metal, referred to as *dayan* and *bayan* (right and left).[3] The *dayan* is tuned to a *swar,* or pitch of the *raga*, often the first, fourth, or fifth scale degree (Sa, Ma, or Pa). The *bayan* is tuned to a pitch that is resonant for the drum and can be modulated by sliding the wrist (*mīnd*) or by providing pressure to the drumhead to reach about an octave range.

  Tabla players perform a variety of different compositions constructed of *bol*s or spoken syllables that approximately correspond to the sounds the drums produce. Saxena describes *bol*s as "rough vocal analogues of the sounds arising from the drums," but continues by cautioning the performer that "the *bol*s are only supposed to resemble, not to describe or explain the character of the sounds produced by the two drums" (Saxena 2006, 7)**.** *Bol*s, therefore, are descriptive rather than prescriptive as they act as a reference to the sound and not as a one-to-one correlation to the exact sound that a player is requested to produce. However, in practice, basic *bol*s such as "na" or "ge" are performed similarly in standard compositions, and if a performer were instructed to play "na" they

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[3] A quick mnemonic method for remembering which drum is which is to touch index finger to thumb in both hands. Like "making an L" with both hands for "Left" and "Right" in English, the hand that produces a "b" is the *bayan* while the hand that creates a "d" is the *dayan* side.

would do so on the edge, or *kinār,* of the right-hand drum, despite the existence of other ways to play the stroke.

A full overview of the different *bol*s is outside of the breadth of this thesis; instead, it is useful to understand the basics of sound production, or *nikās*. *Bol*s can be produced by one hand alone or with both hands in concert; these combined *bol*s are often referred to as composite *bol*s. For example, the right hand may play "ta," a characteristic stroke of the drum, while the left hand performs the open bass note "ge." When played together, these two *bol*s create the composite *bol*, "dha." The sounds follow the phonetic structure of the Devanagari alphabet, in which Hindi is written. "Ta" and "dha" are both dental consonants that differ in the addition of an exhalation of air on the aspirated sound "dha." The aspiration in the pronunciation of the sound "dha" is in turn replicated on the drums through the addition of a bass stroke on the left hand ("ge" + "ta").

The orality of *tabla bol*s allows for the translation of spoken sound onto the instrument. Often, the voice is considered the purest form of musical expression in Hindustani classical aesthetics. The ability to both speak and perform compositions can also be read as an extension of the oral/aural pedagogy of tabla, where the *guru* will often recite to the *shishya* (student) who will then either play or recite back the composition.[4] Nabin Shrestha, my *tabla* teacher, frequently emphasizes the necessity to master speaking a composition before attempting to play it, and he explains that the subtle expressions are mimicked in the voice.

> When we play *tabla*, we try to bring out as much expression as possible. Of course, rhythm is there; rhythm is always underlying. But, for drummers [other percussionists] rhythm is the main thing and everything else comes after that. For

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[4] See Kippen 1988 for a discussion of *tabla* pedagogy.

other percussion instruments, I would even say for *mridangam* in South India, rhythm is the main thing. The expression is secondary. For *tabla* players, the expression is the main thing. It's like if you are a singer, you have to be able to sing in tune, but just because you can sing in tune does not make you a singer. You must sing with all the other ornamentation and have proper pronunciation. You know, you must modulate what you sing. The same thing with *tabla* players. If you can only play a rhythm, that does not make you a *tabla* player. You have to be able to express it. You have to be able to make it sound like a vocalist. (Nabin Shrestha, 2024)

This quote highlights the subtle aspects of playing that define the sound of the *tabla*. Instead of conceptualizing the instrument in terms of drum strokes, rhythms, and patterns, the true defining characteristics of the drums are its timbre, tone color, and expressive capabilities. Understanding *tabla* as analogous to the voice recognizes the expressive qualities and subtle timbral elements as essential to the definition of the instrument.

As a soloist, *tabla* players perform a variety of compositions such as *peshkar, qayeda*s, *tukda*s, *gat*s, and *chakradār tihāī*s. Many of these compositions can be performed as accompaniment, but often more complicated compositions are relegated to solo playing. During accompaniment, the performer will typically perform *thekā* a set pattern for a particular rhythmic cycle, with a varying degree of ornamentation. Every rhythmic cycle (*tāl*[5]) has an associated *thekā*, which emphasizes the important places in the cycle and signals to the other performers where they are in the cycle. Saxena explains that *tabla* accompanists often play simple *thekā*, only occasionally "would he exercise his freedom to play some sweet and simple compositions, wherever he could, even during the total recital, but always in such a way that his creative work did nothing to ruffle the

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[5] *Tāl* is spelled variably when transliterated to Roman lettering such as *taal* or *tāl* and occasionally with the suffixed "a" from the Sanskrit pronunciation such as *tāla.*

main performer's composure (*mizaaz*)" (Saxena 2006, 63). The *tabla* performer is typically required to embellish the *thekā* only to support the soloist or the composition. In the role of an accompanist for an instrumental soloist, the soloist and *tabla* performer will perform *liptna* (friendly, artistic intertwining), where they "simultaneously from any point or *mātrā* of the *tala*, weave some improvised pattern parallel wise, and they arrive at the *sama* [beat one] immaculately together" (Saxena 2006, 64). This playful language demonstrates the mutual collaboration that occurs between the two artists on stage and the co-construction of the performance between the soloist and the accompanist.

Although strict adherence is not as common in contemporary times, *tabla* performers were historically part of certain *gharānā*s or lineages of *tabla* playing. Sudhir Saxena explains, "a musical lineage, more or less similar to real blood relationships, through which musical techniques, compositions and even approaches to music [were] transmitted – in the main, orally – from one generation of musicians to the next" (Saxena 2006, 75). It is often accepted that there are six *tabla gharānā* namely Delhi, Lucknow, Farrukhabad, Banaras, Ajrara, and Punjab, each named after a city or region in which the style originated. The nature of defining and explicating *gharānā*s is fraught, but generally, each *gharānā* has a characteristic performance style, techniques, sound, and originating performer on whose style the *gharānā* is based. The term is often conflated or used interchangeably with the Hindi word *bāj* or playing style. Some *tabla* performers advocate for their specific *gharānā* by stressing its characteristic timbre and performing style to be superior. However, in addition to *gharānā* differences, variability in performance styles is determined by composition type, individual performer, and musical genre/setting. Nevertheless, distinctions in timbre and performance techniques of

different *gharānā*s are useful in demonstrating performer discourse surrounding broad

categorizations of *tabla* performance practices.

Gottlieb explains the similarities between the major *gharānā*s stating, "[the

*gharānā*s] can be grouped into three primary categories: 1) the "Delhi Style," which

includes both the Delhi and Ajrara *gharānā*s, 2) the "*Purab* Style," [East Style] which

includes the Lucknow and Farrukhabad *gharānā*s, and 3) the "*Pakhāwaj* Style," which

includes the Banaras and Punjab *gharānā*s (Gottlieb 1998, 50). The "Delhi style" is often

described as having a "sweeter sound" and the least influenced by the heavier-handed

techniques of the *pakhāwaj*. The Delhi *gharānā, for example,* uses two fingers to play the

bol "tirakita" rather than the full hand, and therefore is often referred to as the two-finger

style (*do ungliyan baaj*). "If method, intricacy, clarity, and sweetness of tone are all taken

into account as composite criterion of good drumming, no *gharānā* of *tabla* playing can

be ranked higher than the Delhi one" (Saxena 2006, 72). The Ajrara *gharānā* also uses

the softer approach of two fingers but includes the addition of the ring finger on the right

hand to increase facility and speed. Saxena claims that this lighter style is best understood

by *rasika*s (expert listeners) and "is meant to be presented only in the setting of a

baithak" or small sitting space of expert listeners (2006, 72). The *Purab* Style is

"concerned with achieving a richer blending of the different sonorities of the *tabla,* […]

the finger movements on the *dayan* (right-hand drum) are confined to the narrower range

of the *sur* and *shyahi*" (middle areas of the drumhead) (Gottlieb 1998, 50). This playing

style avoids the "brighter sound" of the *kinār* (edge), which is characteristic of the Delhi

gharānā. The *Pakhāwaj* Style consists of the Punjab *gharānā,* which is "markedly loud

and resonant," and the Banaras *gharānā* whose "compositions are very vigorously

presented, producing an extremely loud resonance" (Saxena 2006, 70). This brief

discussion of the tonal distinctions between *gharānā*s is intended to introduce the wide

extent of timbral discourse surrounding *tabla* sound production, or *nikās*.

Despite the attention provided to *gharānā*, often the discourse is stronger than the

distinctions in sound. Players have and do develop idiosyncratic approaches that combine

many playing styles and *gharānā* techniques and compositions. "One must accept the fact

that the stylistic differences are not as clearly marked as they are generally claimed to be"

(Gottlieb 1998, 49). The preoccupation with *gharānā* discourse should therefore suggest

the level of attention provided to the sound quality and performance practices by *tabla*

performers.

Timbral Discourse: The Deepest Well and The Largest Stone

"Only when I started recording did I realize this about the *tabla*: if you play 'thun'

normally then it will overpower the rest of the *bol*s" (Nabin Shrestha, pers. comm.,

2023). The ability to rehear or listen to the sound of your instrument emanating from

stage monitors creates a separation between the sound and the instrument. A new

perspective on resonance is afforded. The timbre and tone of the drums in this

construction are mutually created by both the performer's touch and the engineer's

approach to mic'ing and processing. The implications of this co-construction are

intimately entwined in the practice and discourse of *tabla* drumming and *tabla*

scholarship. To understand the perspective afforded by audio technology, it is important

to first consider how *tabla* performers discuss timbral production.

Nabin Shrestha explains that when communicating with a sound engineer as a

tabla performer, it is necessary to first understand your own sound before attempting to

explain it to someone else (pers. comm., 2024). This knowledge is gained through close listening to your sound in relation to the environment and your performance techniques. Nabin Shrestha also explains how timbre is conceptualized and discussed by performers through reference to sound experiences.

> A tabla player will always give you an example. Every person will give their own experience like oh, "na" should sound like a temple bell or this composition should sound like a pigeon. In every composition it's different. Suresh Talwalkar once asked a performer, How do we approach the sound of "dha" [a specific stroke and sound combination of the *tabla*]? So, he said, Find the deepest well in your village and find the biggest rock that you can carry and throw it. And then when that rock hits the water in that well, that's the sound you should look for when you play "dha." (Nabin Shrestha, 2023)

This quote demonstrates the type and degree of attention that *tabla* performers assign to timbre using metaphoric language that invokes environmental references or lived experiences. *Tabla* performers' attention to timbre borders on obsession, with treatises and multi-chapter books written on the different approaches to producing the desired timbre for a *gharānā* (akin to a performance style lineage) or to a specific composition. Gottlieb discusses "darker sonorities" in association with the Farrukhabad players, and "brighter sounds" in the Delhi *gharānā* (1998, 50). When describing the Western playing style (*paschim baaj*), Saxena describes its characteristic timbre as "gently bridled [with a] mellow quality of tonal resonance, and a pervasive crispness of playing which is all quite winsome to the *rasika*" (expert listener) (Saxena 2006, 78).

Discussions of sound quality typically revolve around either the role of the musicians in terms of their hand placement or hand weight (*wajan* or *vazan*) or the craftsmanship of the drums (Roda 2015)**.** Although these are two important and seemingly main factors in the sound production of the drums, the discussion of timbre

production is expanded when the drums are analyzed within the technological mediation in which they are often experienced. The sound of *tabla* is often experienced by those around the globe primarily through the mediation of audio equipment be that in the form of an MP3, or other digitally compressed format, or in a live setting where the sound is reinforced through a PA system. A microphone transduces the physical sound, which emanates from the instrument, produced by the player on expertly crafted drums, and converts it into an electrical or digital signal. This sound is no longer in the direct control of the *tabla* artists and now is in the realm of the intersocial actors comprised of audio technicians and audio technology.

The method through which sound is mediated in this field of actors is determined by the history, setting, and live sound culture of the actors involved. *Tabla* players are concerned with *nikās* or sound production, but discussions of the timbre and tone of the drums often employ the slippery language of metaphor and nondescript adjectives to describe the subjective characteristics of timbre. It is here in the multivalent production, discussion, and understanding of timbre where power is expressed by technology, technicians, and performers. In their ethnography of recording studios in Turkey, Eliot Bates states that "in the context of Istanbul's recording studios, it is not so much in discourse about recording aesthetics where conceptions of traditional music-making change, but in the practices themselves" (Bates 2010, 88). Performance practice and, as demonstrated by Bates, recording practices, shape changes in music-making. In the case of *tabla*, live sound engineering further affects changes in practice and convention by producing multiple concurrent domains of sound control and sound production.

Chapter Two: Technology and Music

India and Technology: Orientalism, Hindu Nationalism, and Stereotypes

A discussion regarding technology and India can be fraught with problematic assumptions and stereotypes about Indian dominance in IT fields or opposing perceptions regarding India as a developing country, lacking technological infrastructure or access. This thesis does not attempt to dispel assumptions or stereotypes but rather contextualize how Hindustani classical music interacts with recording and amplifying technologies. This problem is further compounded by colonial histories and usages of Western technology as a form of oppression by the British (but also the Portuguese, French, and Dutch) on the inhabitants of the Indian subcontinent.

For the sake of simplicity, I will use the term technology to refer to electrical and digital technologies (mainly to refer to microphones, amplifiers, speakers, cables, audio consoles, and processing equipment) rather than the more general reference to a tool or the Webster definition as "a manner of accomplishing a task, especially using technical processes, methods, or knowledge." Science and Technology Studies have complicated definitions and demonstrated that technology and modern science are not "benevolent, apolitical or value-neutral," with some authors arguing that technology played a deterministic role in European colonialism (Kumar 1995, viii).

Citing Adas, Kumar argues, "Science and technology were central to the European sense of what it meant to be civilized" (ibid., 12). The act of carrying a recording device and requiring individuals to record can be read as a demonstration of power and control over the bodies of people. Kumar further describes how colonial officers argued that "the 'natives' had an in-built, cultural bias against manual work and technology [… but] of raw materials there was no shortage;" "the rulers, moreover, educated their subjects only up to a point. Beyond that, they withheld the culture of technology" (1995, 11-12). Narratives of technological dominance served as validation to colonial officers of their belief in Western supremacy that resulted in the loss of lives and destruction of land. Technology has additionally been demonstrated as making possible the global movement of Hindu national and Hindutva violence (Chopra 2008; Sundaram 2020).

Sound Technology in India: Gramophone, Bollywood, AIR, and the License Raj

Most of the scholarly literature on audio technologies is concentrated around the film industry, from the introduction of talkies, the advent of magnetic tape and eventually digital recording processes (Booth 2008); or broadcasting such as the state-sponsored radio station AIR (Alonso 2019); or in terms of the gramophone's impact on listening habits, performance practices, and gender perceptions (Lubinski 2015, Neuman 2009). Attention to technology in live performances has not garnered the same scholarly attention. Most public writing discusses amplification technology in terms of contempt and disdain toward diminished sound quality. Critics often discussed microphone quality in their reviews of performances. A 1957 reviewer in the *Times of India* writes, "One of

the features of Tuesday's session was the misuse of the microphones. The one on stage was extremely noisy" (Our Music Critic 1957, 3).

Musicological inquiry into live sound engineering is nascent in Western contexts too. In his 2018 dissertation, Whitney Slaten suggests that "soundmen" "assert their professionalism through 'hiding in plain sight'" and explains that their "cultivated hiddenness – their absent presence – has also kept them from receiving the robust scholarly attention their importance clearly merits" (Slaten 2018, 2). In this thesis, I will address this scholarly lacuna by illuminating the "hidden" mediation of sound technology. To do this, I will draw on parallels between recording studio technology and studio ethnographies to provide a foundation for a discussion of live sound. Despite the radical contrast in space, role, and ephemerality between live and recorded, similar processes of particularizing a sound into component parts and domains of control occur in both practices. Considering this dearth of academic writing regarding live sound technology in India, I first review the existing literature regarding sound technology in general to trace developments and practices in Indian sound production.

The advent of the gramophone impacted the modes through which people in India listened, performed, and experienced music by disembodying the performer from the performance and allowing for repetitive listening (Neuman 2009). Several years after the creation of the Gramophone Company by Emile Berliner in 1898, the company sought to expand its reach to international markets. In India, the gramophone began as "a technological marvel and luxury import for an elite minority [… as a] form of musical entertainment" (Hughes 2002, 446). These expensive luxury items were "capable of collapsing the spatial and cultural distance between Europe and India" by "[relocating]

world-famous European musical artists to the intimacy of the home" (ibid, 447). Audio

recording and playback technology originally served to reduce the geographic barrier

between European colonizers in India and the musical markets in Europe, but

concurrently, a different usage was emerging, one connected to the nascent field of

ethnomusicology and colonial dominance. Lubinski explains that "travelers for long had

carried the gramophone to distant places, from jungles to the arctic ice, […] symbolically

reinforcing the alleged superiority of Western technology" (Lubinski 2015, 176). To

ignore the "civilizing mission" of early recording technicians is to brush over the messy

and complicated network of interactions and discourses that revolve around recording

technology. From the early days of recording technology, individuals (some later viewed

as amateur ethnographers) traveled with the gramophone to preserve music traditions that

they believed were disappearing due to Westernization, Modernization, and further

Globalization. This preservationist attitude is also expressed in many Indian newspaper

concert reviews that lament the death of unrecorded musical knowledge upon news of

Hindustani classical musicians' deaths.

Despite this Romanization, the prospects of the Gramophone Company were

more focused on capitalistic enterprise than cultural preservation. The company elicited

as many recordings as possible, typically of female performers, in a wide variety of

regional languages to market to the diverse language populations of the sub-continent.

The early recordings by the Gramophone Company were decided "in most cases, in an ad

hoc manner based on either circumstances or the weight of recommendation" (McNeil

2004, 316). Among the artists recorded in the infancy of the Gramophone Company in

1902 are Goharjan, Jankeebai, and Dulari (Joshi 1988, 147). These women were mostly

*tawaif*s or "highly sophisticated courtesans […] brought up in accordance with age-old

custom and tradition" (Nevile 2009, 66 cited in Singh 2014, 177). During the Colonial

era, their perception was "marked by a shift in the perception of the courtesan who now

became a mere performer, an entertainer rather than a dispenser of the aesthetic graces of

the courtly culture" and the British colonizers referred to them as *nautch* girls, an

Anglicized distortion of the Hindi word *naach* meaning dance (Singh 2014, 179). There

existed an early hostility and controversial public opinion towards being recorded

because of Colonial and Victorian implications that marked female performers as "public

women." However, the scholarly discourse surrounding the impact of early technology

on female performers is varied and often interpreted in contrasting ways because of

layers of intersecting identities of caste, religion, gender, age, and social standing. Some

argue "that the microphone and gramophone became instrumental in promoting the

participation and public performance of female musicians from 'respectable' families" by

"abstracting the live music performance [… and promoting] their [musical] product as

being a more respectable medium through which to enjoy *devadasi* performances" (Tula

2021, 1120; Hughes 2002, 450-451). This "dissolution/invisibility of the body of the

female singer" contrasts with how some authors discuss perceptions of recording artists

as "public women, […] women singers and actresses who became the embodiment of

obscenity and moral corruption" (Tula 2021, 1126; 1119). This division is contrasted

with the further gendered opinion of "established male singers of the time [who] received

it [the gramophone] with disdain and suspicion" (Tula 2021, 1124).

Early classical musicians were hesitant to record. As Joshi notes, "They did not

like the idea of putting their art on gramophone discs because they felt that their treasure

of artistic knowledge would be cheapened" (Joshi 1988, 152). Generalizations and stereotypes of "uneducated older masters" are reflected in statements by modern performers who equate the hesitancy to adopt recording technology with superstitious beliefs. Zakir Hussain said,

> The older generation of great maestros like Ustad Faiyaz Khansahib, Munir Khansahib, Omkarnath Thakurji, and others believed that if you were asked to sing into a microphone – at a recording or concert – it would somehow draw away their voices and they would not have any voice left. (Hussain and Kabir 2018, 149)

Before the advent of amplification technology, performers of Hindustani classical music would typically perform for small audiences of royal elite and upper-class individuals in the setting of a *baithak* to knowledgeable listeners or *rasika*s. These settings were marked by intimacy due to the proximity of the audience and performer, but as patronage moved from princely courts to public settings, performances moved to larger halls and stages. This change in locality created a larger distance and separation between the audience and performers, leading to the necessity for sound amplification. Deepak Raja hypothesizes that Ustad Faiyaz Khansahib performed with a throaty and guttural vocalization to be louder and reach more people in acoustic environments where sound amplification was not available (2016). Raja also claims that the movement to larger venues was not only possible because of sound amplification, but also that the amplification technology reduced the usage of "masculine" playing styles or loud instruments such as the *pakhāwaj* or the *shanai* (2016). Regardless of the gendered language in this claim, the use of *tabla* rather than louder drums such as the *pakhāwaj* or *tāsha* could be attributed to the ability of *tabla* players to utilize the sound system to amplify the subtle nuances in playing.

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Musicians gradually accepted the new technology in recording studios and
performance settings where facility with the microphone often led to greater acclaim.
Opinions and perceptions of recording technology developed. By the early 1940s, being
recorded was perceived as prestigious, and amplification technology was ubiquitous
(Shah 2016). Kippen (1988) explains, "From the 1930s onwards, state patronage in the
form of All India Radio offered a number of secure, permanent jobs and the opportunity
to broadcast" (41). Performers now had to perform with audio equipment, and some
learned how to use this technology in particular ways that would enhance their sound.
South Indian Carnatic vocalist M. Balamuralikrishna's use of amplification technology to
engage an audience is representative of a shift towards the practice of engaging with the
capabilities of audio technology.

> Balamuralikrishna was another artiste who learnt [sic] quickly how to use the
> microphone to good effect in his path-breaking recordings as well as to wow
> audiences in concert halls. Just an 'mmmmm' by Balamurali into the microphone
> was capable of drawing ecstatic applause. (Sridhar 2017, n.p.)

Similarly, Zakir Hussain explains,

> The later generation of musicians including Amir Khansahib, Bade
> Ghulam, Ali Khansahib, Begum Akhtar, Ravi Shakarji, and my father
> understood the benefits of technology. When the Ustads had learned the
> art of recording and how to use the microphone effectively, they realized
> they could go back into the sound booth, hear the quality of the recording,
> and fix it, if need be. They also saw the importance of having a sound
> system in a concert hall – this was important because we had graduated
> from *baithak*s to large stages. The early sound systems in concert halls
> were basic and did not have the kind of layering that became available to
> us. In the early days, the speakers just threw out volume – a crackling and
> sometimes very shrill sound. But somehow the singers' voices and the
> instruments did not get distorted. (Hussain and Kabir 2018, 149)

Although not a historical account, Zakir Hussain's statement presents several interesting
facets of the nascent introduction of technology into Hindustani classical music. This

quote demonstrates the new ability to alter one's sound through "repetitive listening" where a previously ephemeral performance could now be edited or rerecorded. It also describes the early transformation of performances from small sitting rooms to large auditoriums that required sound amplification.

The development of technologies and access to equipment in India similarly changed over time from British-led companies to the later domestication of production within India. During the early twentieth century, audio recording and playback were largely controlled by the British-origin Gramophone Company in India. In 1938, The National Record Company, with the slogan "Young India," flooded the market with Japanese-made gramophones which ultimately failed. Domestic production of audio technology was tied to the Swadesh (Homeland) movement to domesticate production. The Indian-made Chicago Radio microphone appears in many independence speeches of the 1940s. Eventually, the production of recordings was domesticated, and the Gramophone Company advertised, "Our Indian, Burmese, and Ceylonese records are now made at our Calcutta factory – using Indian materials – by Indian workmen" (Kinnear 1994, 30 quoted in Lubinski 2015, 182).

In the Bollywood industry, Booth explains that "the quality of available microphones gradually increased during the 40s and 50s but recording technology and process remained very much the same" (2008, 59). The desire to maintain domestic production extended post-Partition with the "license Raj's" "policies that limited foreign investment [but] also made access to filmmaking materials and new technologies difficult for Indian filmmakers, musicians, and recording engineers" (Booth 2008, 59–60). This sentiment was expressed by many at the time and has been used to explain any early

differences between Western and Indian music recording until the liberalization of the Indian economy in the 1980s and 1990s.

Booth explains that "the availability of specific technologies was the result not only of actual technical options but of economics, cultural choices, and Indian government policy" where engineers and musicians operated in what Braudel 1972 describes as "limits of the possible" (Booth 2008, 56). G. N. Joshi tells a story where "the local staff were under the impression that [the machinery was] absolutely the last word in recording technology," only later did they realize that they were using outdated equipment; "the old machines were discarded, and shipped to the offices in India" (Joshi 1988, 154). The circumstances in which musicians and engineers operated should not be interpreted as leading to a deficiency in sound quality but should be recognized as historical barriers to access to new technology. Many engineers and musicians created ingenious workarounds to problems such as irregular power supply or faulty equipment. One such instance in Mumbai is retold as,

> When the recorders were running slow, the musicians would have to tune their instruments higher so that their sharp tuning, recorded on the now-slow machines, would compensate enough to match the tracks recorded when the machines were running faster, which are now sharp. (Booth 2008, 78)

In the late twentieth century, studios reached the double digits in available recording tracks. Prime Minister Rajiv Gandhi began to dismantle the "license Raj" in the 1990s through market liberalization which, "For musicians and recordists, […] meant a gradual easing of restrictions on foreign imports and technologies" (Booth 2008, 76). However, some have suggested in online interviews, such as engineer Sai Shravanam, that upgrading equipment remains difficult, "a constant struggle in a country where many

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brands have no distribution" (Inglis 2021, n.p.). When brands are available, the cost is often difficult for those who want to build a home studio. "Buying that microphone was very difficult for my family, it was a very big investment for them" (ibid.). Shravanam does not interpret the apparent lack of adequate technology as a burden but rather promotes "adapting the recording environment and using relatively humble gear in imaginative ways" (ibid.). This overview highlights human agency in discussions of technology that often reduce the individual to that which is acted upon by technology rather than as someone who uses technology in new and intriguing ways. The following section introduces the broader scholarly literature surrounding audio technology including ethnographic studies of studio spaces to provide a framework to discuss the interplay between *tabla* and technology more broadly.

Technological Determinism, Agency, Technology, and Liveness

In this section, I will supplement a discussion of technology and music with a review of the nature of technology to avoid statements of technological determinism and to maintain the agentic power of the user. "Every technology brings with it a particular logic, a structure that, among other things, is a means of bringing order to the world" (Winner 1999, 32). Although this quote has a degree of veracity, it is necessary to note that the designed logic of a technological product does not necessitate single modes of operation by the user. A DAW (digital audio workstation) may be designed and optimized for a specific workflow, but that does not translate into a single possible workflow. Often an individual will invent (figure out) a unique mode of operation within a software program to "make it do what they want it to," regardless of how designers intended the software to work. The design and implementation of software and other

technologies can work as a feedback loop, where this new mode of operation influences

the design of a new technology, but that does not necessitate that this new technology be

used in this prescribed way. Greene describes the ability to manipulate technology to

one's intent as *kludges,* or "inelegant but effective ways of bypassing technology's

inflexible features for creative ends" (Greene 2005, 6). In Hindi language spaces, the

word *jugaad* is often used to represent a similar idea, that is the act of making something

work in a specific desired outcome, akin to "jerry-rigging." By assuming that a piece of

technology "brings order to the world," notions of human agency are overlooked, and

presumptions of technological determinism are approached.

Technological determinism is "the idea that tools, machines, and other artifacts of

human invention have unavoidable, irresistible consequences for users and for society in

general" (Katz 2010, 3). This is often expressed in common and often unexamined

statements such as "the computer has changed everything, or photography changed the

way we look at life." In musical spaces and writings about music, technological

determinism is expressed in phrases such as, "recording technology has changed the way

music is composed." On the surface, this is an attractive statement; with the advent of

music recording technologies, performance practices have developed. For example,

multi-track recording capabilities made it possible to overdub instruments, melodies, and

harmonies, and takes from different temporal instances to create a sound that could not

possibly exist without the technology. However, it is important not to attribute this

composition practice solely to the advent of new technology. Musicians, engineers

(recording and soft/hardware engineers), producers, and listeners determine how a

technology will be used. Katz emphasizes this distinction by saying that,

A recording's influences manifest itself in *human* actions. Put another way, it is not the technology but the relationship between the technology and its users that determines the impact of a recording. (Katz 2010, 3)

This distinction may seem miniscule, but its implication recenters artists and how they interact with the world around them.

The term "phonograph effect or "any change in musical behavior that has arisen in response to sound-recording technology" may appear to argue for technological determinism (Katz 2010, 13). However, by focusing on how the "musical behavior" changed "in response to" rather than "because" or "as an effect of," the concept can imbue agentive action to the performer rather than to the technology. In a conference presentation, Deepak Raja explained that technology both brought music to a wider public (through the dissemination of recordings) and that amplification led to voice culture (the attention to vocal timbre) and the development and popularity of new instruments (2016). By discussing the relationship of events flowing from technological development to musical change, these statements evoke technological determinism. It is important to understand these instances in how individuals worked as actors in these developments. Music was capable of being spread to more people because record companies used the technology to streamline production (and later informal networks of cassette sharing as demonstrated by Manuel 1993). New instruments, such as *tabla* replacing what Raja defines as the louder *pakhāwaj*, should not be attributed alone to the capabilities of electrical amplification but instead to the aesthetic decisions of the performers (2016). The *pakhāwaj* players did not need to use a microphone even though one was available; the *tabla* players could however utilize the amplification capability to their advantage to enhance their sound.

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The artistic and creative labor of recording studios has been acknowledged in studies of popular culture and musicology. This has shifted musicological discussions from the "musical product to the musical process," where music is viewed as mediated through the various processes, techniques, and approaches in the recording studio (Scales 2012, 55). Discussions of musical fidelity abound, and aesthetic choices are determined and discussed in relationship to the perceived amount of mediation that has been applied to the recording. The moniker "live" is often applied to music that is perceived to be unedited, but the definition of "what it means to edit" is often vaguely understood and interpreted differently in different contexts. For example, a concert recording of a rock band may be marketed as "live," but the sounds heard on the stage are still mediated through electrical and digital processes that produce the given aesthetics for that particular genre. A recording of a Beethoven symphony may be perceived to be unmediated or live, but it is common to edit or splice together multiple takes, regardless of the impact that this act has on its perceived "authenticity."

Discourse surrounding audio technology often contrasts the modalities and operations of studio recording with concert performance through the idea of liveness. A studio recording can be continually edited and reworked, so it is often presumed that the level of mediation is higher in that domain. Porcello explains that much of the recent writing on the capabilities of recording technology is quick to polarize live and recorded musics precisely along the lines of the authenticity of the live performance over that of the recording (Porcello 1996, 253). A live performance is perceived to be raw or unmediated, but the distinction between the two is minimized when one analyzes the processes through which live sound engineers work. Many of the techniques and audio

processing done in recording studios such as pitch correction are regularly applied to live performances. The desire to view a live performance as authentic may be an extension of the Western desire to valorize the author as a singular genius composer rather than recognizing the network of interactions between individuals and equipment that are responsible for the creation of a musical work.

The live event is further contrasted with the recorded in its ephemerality as a recording reduces the temporal existence of a performance by allowing for a single performance to be experienced multiple times. Dard Neuman argues that the gramophone was the impetus for the creation of a "live event" in India, "which had the novel quality that it could be experienced only as a single, momentary, and evanescent instant" (2009, 100). Neuman does not argue that performances prior to the gramophone were not experienced in an "evanescent instant," but rather because the gramophone normalized repetitive listening this distinction was now capable of being made. "The 'live' event […where music was] now understood as resistant to capture and preservation, became embedded with a uniquely modern aura of singularity" (Neuman 2009, 100). But how does the mediation of electrical processes affect this notion of liveness?

Liveness is also discussed in opposition to mediation in the form of technology. When a sound is transduced and processed by a microphone and sound system, the sound is no longer emanating from the physical instrument but instead from a recreated form of its original self. One reviewer for the *Times of India* in 1992 wrote they had,

> A rare opportunity to savour [sic] two hours of mikeless music at a compact *baithak,* arranged in a spacious drawing-room. The audience comprised only 40-odd listeners. Several of them were hard-boiled *rasikas* from the older generation, who had shared the pleasures of real 'live' music of the '40s.' (Nadkarni 1992, 8)

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In this conceptualization of liveness as an absence of any audio processing or amplification, the usual construction of live as "an evanescent instant" is challenged. Instead, live evokes reference to a human performer directly transmitting their bodily processes into acoustic energy.

Besides liveness and mediation, the auditorial aesthetics of a genre have also been analyzed in a capitalistic market approach to demonstrate how production practices place a musical work into a genre to be marketed and sold to specific segments of the market. Simon Frith defines "genre discourse" as the process through which "businesses create and control both musical genres and the markets they define for them […] where mediators and ideologues make new sounds available, but also try to control stylistic evolution and place it for the right audience" (Frith quoted in Tucker 2010, 143). This understanding can be seen as a development made during a period when large record companies largely controlled music markets in the U.S., including the "world music industry"; however, this argument ignores the bottom-up agency of individual artists and engineers in creating their own characteristic sounds. As the 21st century progresses, the ability for individuals to create and distribute through over-the-top (OTT) infrastructure necessitates further attention to the individual and the multiplicity of approaches and understandings of sound, timbre, and audio recording/reinforcing.

Many ethnographies have taken the recording studio as the center of study or location for ethnographic research (Meintjes 2003, Ayyagari 2014, Fiol 2013, Bates 2016). These studies recognize that recording and mixing is a "dramatized struggle over signs embodying values, identities, and aspirations." (Meintjes 2003, 9). Christopher Scales discusses the term "recording culture" as both a process of reifying cultural

phenomenon into "mass-produced, and commercially available cultural products […] But recording culture may also be understood as the "culture of recording," the ideas and behaviors of particular social groups who engage in the practice of recording music" (2012, 3). This concept could be further developed to include the processes and interactions that construct the cultural field of live sound engineering. In extending the scholarship in recording technology, I suggest expanding the term "recording culture" to "live sound culture" to include the processes, ideas, behaviors, identities, and knowledge of the live sound domain.

Nomenclature: Who does Live Sound?

Live sound is often referred to as sound reinforcement or sound amplification because the task of the audio engineer is to amplify the sound on the stage. I will refer to the individual who operates the main sound console as the audio engineer, but it is worth bearing in mind that this individual is also referred to as the mixing engineer, front-of-house engineer, the sound guy (with the gendered implication), sound person, sound operator or the sound-*wala* in Indian contexts. Each of these titles bestows upon the individual different levels of status, labor, and roles. For example, the Front of House (FOH) engineer contrasts with the monitor engineer who works from the side of the stage with a second console to control the levels of the on-stage speakers or in-ear monitors (monitors meaning speaker or way to monitor one's sound). This engineer is often only hired for large concerts or performances with numerous musicians and monitors on stage, in the case of smaller acts, the FOH engineer often controls the levels of the stage monitors from their position in the crowd. Live sound engineers often strive for their work to be contradictorily unseen, unheard, or transparent (Slaten 2018, 2).

The title "mixing engineer" could reasonably fulfill the duties and job requirements of the audio engineer, but this title suggests that the engineer does little more than balance levels, add EQ, and reverb, overlooking the interpersonal interactions with various actors, and their duties of setting up and troubleshooting sound systems. However, one interlocutor in Delhi referred to a sound engineer who is overly reliant on the meters and displays of their console, as the sound operator. Anindo Bose suggested that the division of labor and the cheap cost of manual labor (because of relatively low wages and high workforce) allowed this designation because often a team is hired to set up, tune the system, and troubleshoot technical problems (pers. comm., 2023). *Tabla* performer Zakir Hussain's main engineer, Mujeeb Dadarkar, also stated in an interview in response to the question, "What are the largest differences between live sound in Europe/America versus India," that the infrastructure (technology and equipment) are identical, but that in the West, job responsibilities are often highly regulated, meaning that progress can be halted if the person whose job it is to do that act is not present (Dadarkar, 2018).

Furthermore, the title "sound guy" has its obvious gendered implications, which are sometimes remedied through the use of the term "sound person." This title reduces the position of the engineer to an unskilled operator of equipment and does not recognize the scientific and experiential knowledge required for the role that the term audio engineer does. Satyaprakash Mishra, a *tabla* performer in Mumbai, suggested the term "sound-*wala*," meaning the one who does sound in Hindi, *vala* being a suffix added to occupations such as rickshaw-*vala*. Mishraji was also intrigued by my usage of the term "audio engineer" because of the level of respect that it denotes for a position that is often

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viewed to be a labor occupation (pers. comm., 2023). Despite using this address, the

tabla player recognized the integral role that the audio engineer plays in the production of

the performance. Many musicians and engineers in India routinely discussed the impact

of technology on performances such as one interlocutor who explained that they feel

insecure and as if they are not talented players when the sound is not done correctly (pers.

comm., 2023). Saptak Sharma, a *tabla* player in Delhi, explained that his sound is so

important to how he plays that he will spend upwards of fifteen minutes sound-checking

his drums before a show, even if that means postponing the start of the performance

(pers. comm., 2023).

     The next section of this paper will analyze discourse surrounding Hindustani

tabla performances regarding audio technology to analyze how discussions of technology

can address issues of status, performance practice, and power. The data were collected

from interviews and communication with *tabla* performers in India and the U.S. during

2023 and 2024, archival documents of concert reports, blog posts and forums discussing

technology and *tabla,* and online interviews with musicians and engineers.

Chapter Three: Discourse Analysis

Speaking of the Elephant: Sound Amplification and Tabla Discourse

This section of the thesis will analyze and discuss Hindustani Classical music, *tabla,* and technology discourse in terms of agency, power, vocality, and performance practice. The discourse found in historical concert reviews is overwhelmingly disdainful of technology. Critics often lament clashes between tradition and modernity, poor audio quality, and the problems that arise with the use of sound amplification technology. However, the performer and engineer discourse is rife with perspectives that portray audio technology as an impetus for the development of new instruments and techniques. It is also sometimes interwoven with technological deterministic claims about technology as an agentic power and a drive to these changes. This discourse overlaps broadly with concepts of power, control, tradition, status, and performance practice and is intended to further discussions of *tabla* performers by engaging in the messy interaction of human and non-human actors in Hindustani classical music. This approach will combine previous scholarship and theoretical frameworks to situate *tabla* performers and audio engineers within a complex network of intersecting domains of power and performance.

Microphone Selection and Embodiment of Vocality

The centrality of the voice in Hindustani classical music aesthetics is continually iterated in comments regarding performance techniques on instruments that seek to

emulate the tonal qualities of the voice. Pitch bending and sliding capabilities on stringed instruments such as the *stiār, sarod,* and *sarangi* are valued over the discrete pitch layout of keyboard instruments such as the *harmonium,* to the extent that the *harmonium* was banned from broadcast on the national public radio station, AIR (Rahaim 2011)**.** Similarly, the ability to recite *tabla* compositions and the left-hand drum's ability to bend and slide in pitch are recognized as the *tabla*'s power to emulate vocal production. The degree of comparison between *tabla* and the voice is often expressed in statements regarding the uniqueness of *tabla* tonal production, "*Tabla* is unlike any other percussion instrument, instead of thinking of it as a drum, you should think about it like the voice" (Nabin Shrestha, pers. comm., 2024).

Tabla's embodiment of the voice has permeated into discourse about appropriate microphone techniques, as represented on forums and blog posts discussing "How to properly mic *tabla.*" One would expect recommendations for this situation to be in the form of explanations of standard methods for mic'ing a percussion instrument (i.e., to capture the quick transients of the attack and capability to handle high sound pressure levels while maintaining detail on more subtle attacks). Engineers and musicians do offer this type of advice, such as, "I like the earthworks-mikes for nearly all kinds of percussion, they sound really natural & catch all the fast transients of percussion instruments" (Micing tablas? 2001, n.p.). Additionally, quite a few commentators suggest using a certain microphone by referencing a well-known musician who also uses that microphone. This suggests reverence towards a particular player and a desire to emulate their sound. "I've also recorded Swapan Chaudhuri and spoken to Zakir Hussain, who only uses SM57's live" (Micing tablas? 2001, n.p.). The SM57 is a standard microphone

for mic'ing many live instruments because it is inexpensive and durable. This microphone is often used for both vocalists and percussion instruments.

In addition to general recommendations for recording percussion instruments and the practice of referencing respected performers, the discourse surrounding *tabla*'s ability to embody vocal production is reflected in audio engineering techniques. "Any mic that is recommended for voice is good for *tabla* too. You will find that most people recommend SM 57 and SM 58. They are excellent" (Indian Music Forum 2003, n.p.). Beyond suggesting that a microphone, suited to picking up the particular sonic characteristics of a voice, is also capable of capturing those characteristics of the *tabla*, this comment equates the *tabla* with the voice. Both statements quoted above suggest the same microphone (SM57). However, the differing reasoning indicates the values and norms that they ascribe to the drum. Positionality as either an engineer or a performer affects and informs decisions by valuing either the technical capabilities of the microphone or the sonic attributes of the drums. In this case, the specific microphone choice is less insightful into the modes of operation in the live sound social field than the explanation that led to these decisions.

Similarly, Nabin Shrestha has suggested that *tabla* should not be treated as a percussion instrument but rather in the manner of a vocalist (pers. comm., 2023). Nabin Shrestha earlier made a distinction between *tabla* and other percussion instruments by suggesting that the uniqueness of *tabla* is in its ability to expressively modulate tone. The left-hand drum is particularly responsible for "vocal-like" modulation since the performer can apply varying degrees of pressure to slide the pitch (*mīnd*) or more rapid articulations in pitch (*gamak*). Nabinji suggests that the characteristics that mark a singer are not

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merely singing in tune (analogous to simply playing in time as a *tabla* performer), but rather in the expressive and emotive qualities of the voice. The subtle expressive aspects mark both the voice and *tabla* rather than their foundational elements of pitch and rhythm respectively.

Concerning audio technology, Nabin Shrestha makes a comparison between the vocal recording practice of retaining breath sounds as expressive markers in a vocal recording and the necessity of properly capturing the faint slides, scrapes, and taps on the *tabla.*

> If you sing into a good mic, like even if you breathe in, that factors into the expression part, right? They [the engineer] keep it. They don't cut out the breath sound. So even in *tabla*, all these subtle sounds [proceeds to play *bol*s while emphasizing the periphery sounds]. It must be there. So, when I play "ti," if you just use this sound [plays "ti"], it's not going to come out as "ti." I need this little bit of scratch here. You know, when I play "tete," all the sound that is happening, that's coming out, it has to be there for it to sound like one. But in drums, you know how they sound check drum. They are like, dang, dang dang dang [mimics hitting a drum hard with a stick], check the volume and be like, oh, maybe a little louder, a little less. And then they will go to another one. That's not how *tabla* players sound check. They will be like, oh I cannot hear this [rubs his hand on the drum]. They try to find those subtle sounds. So, when I sound check, I will be like, okay, so if I cannot hear this [plays "ti"], and I know I'm playing it loud enough or strongly for this to be there [the scratch]. And if it's not coming out, it must be some frequency that is suppressed or something. I sound check like a vocalist where every quiet sound and every loud sound is audible. (Nabin Shrestha, 2024)

Rather than comparing the sound of *tabla* to the voice, this quote instead highlights the processes that construct the voice in a live sound field. The voice is marked as the voice through the unique processes during sound check and the attention afforded to the qualities of the voice that are not foundational (pitch and volume), but rather those distinct characteristics (breath sounds, tone). During soundcheck, these same processes mark *tabla* as unique and distinguished from other percussion instruments. The focus on

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the periphery and subtle characteristics as defining factors of what it means to be a vocal or a *tabla* sound allows *tabla* to embody the state of "uniqueness" typically afforded to vocals. This discussion reveals that the decisions in the live sound environment are shaped by the system of signs and meaning derived from aesthetic and theoretical conceptions of what *tabla* means. In turn, these decisions recreate and produce the alterity ascribed to *tabla* as distinct from other percussion instruments.

"The Somewhat Considerate Treatment to Which it Responds Best"

 Tabla drumming is a practice of subtlety, as expressed in instrumental techniques such as *mīnd* (bending of the pitch), *gamak* (abrupt pitch change), and the light playing techniques from Delhi Style such as the use of the fingers or the addition of the ring finger in the Ajrada *gharānā*. The techniques used to produce these sounds typically utilize smaller muscles in the hands and hence the volume produced is often much lower than the more robust techniques of *pakhāwaj* playing techniques. Audio amplification is used by performers to enhance the sound of these more subtle techniques, to be able to play in a style that does not cause injury. Zakir Hussain explained to Michael Parillo in an interview that,

> In the old times, the advent of a particular style of music, which was not as vigorous and strong and required a subtle accompanying instrument, helped to develop *tabla* technique […] Later on – in the last eighty years or so – microphones started coming in and people found that instead of playing hard they could just turn up the volume and still maintain a nice touch. You can actually have a tone, so you can go (plays a delicate bending note on the bayan), which you couldn't do in the olden days because the tone did not project that much. (Hussain and Kabir 2018, 93–94)

Here, Zakir Hussain discusses the ability of *tabla* performers to balance their tone by harnessing the capabilities of the sound system to amplify their volume. Nabin Shrestha

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similarly demonstrated this when he discussed how it is possible to play *bol*s such as "taragena" that use the first three fingers on the right hand at high speeds. Without amplification, these *bol*s will not project and the volume discrepancy between this subtle technique and louder strokes such as "kra" will be incongruous. However, with the capabilities provided by amplification technology, he can perform these quieter *bol*s in a relaxed manner at a volume that is similar to the rest of the strokes.

Even though the performer can utilize *bol*s from more subtle playing styles, the performer must also change their approach to performing overall by compressing dynamic range. Nabin Shrestha emphasized that even though "taragena" is louder he must also minimize the force applied to louder strokes to prevent distortion (pers. comm., 2024). If he were to maintain a sharp distinction between the loudest strokes and the quietest, then the balance would similarly be reflected in the PA sound. The loud strokes would remain loud and distort the equipment while the quiet strokes would remain inaudible. Thus, there appears a paradox in that while audio amplification technology does allow for balancing in dynamic range, the process is only possible by the mediation of the player in minimizing their dynamic range. Technology is not determining the process but rather the performer is adjusting their approach to maximize their sound output by reducing their loudest strokes for the overall amplification of their sound. Amplification of the quietest sounds allows for greater attention to the minute qualities of the performance.

Performers also discuss how sound amplification can allow for extended periods of performance with less physical power output. With the assistance of the amplification,

tabla performers can play with minimal physical intensity while maintaining a high volume output. "I mean, I make my volume very loud and I just play. I can play for hours" (Satyaprakash Mishra, 2023). Satyaprakashji also expressed the role of the audio engineer in allowing him to perform with less effort when explaining,

> So many times I don't get sweaty, really. I usually get a lot of sweat. Sometimes I'm not at all sweaty because I have a good audio engineer doing me good sound. Without any effort, I'm playing. (2023)

The Mutually Tyrannical Relationship with the Microphone

As discussed above, artists and performers during the early 20th century expressed disdain for audio technology with statements that suggested cheapening of their art or superstitious beliefs about the potential of sound technology. However, these beliefs were dispelled towards the middle of the century, and performers began to record, broadcast, and regularly perform with microphones, amplifiers, and recording equipment. However, contempt for unwanted distortion, disruption, and mediation of sound by audio equipment remains. Sarangi artist Ram Narayan complained that the microphone "affects the quality of sound. The role of the microphone should be progressively minimized. We all know how this demon disrupts a good concert" (*Times of India* 2000, 4). Comments such as these point to continued complications with audio technology, poor audio engineering, and a desire for unmediated music performances. Discussions of microphones led to reminiscences of an imagined past and nostalgic romanticism such as when P.G. Burde writes that "Ravi's [Bellare (percussionist)] presence on the stage was enough to rekindle nostalgic memories of music festivals of those days when microphones were still at a primitive stage, and yet the finest music was heard" (1990,

15). In this sense, technology was viewed as a distraction or corrupting the performances, leading to diminishing in quality and a "tyrannical relationship with the microphone" (Our Music Critic 1958, 5). Some commentators even suggested that poor sound quality is an effect of listeners' focus and concern for content rather than timbre.

> In the 1960s and '70s, technology was nascent, but the audience had a sense of intimacy with musicians […] but in big gatherings, organisers [sic] would use cone mikes, and few cared about the sensitivity and fidelity of sound. Everyone was focused on musical content. (Sridhar 2017, n.p.)

Just as a good engineer can allow a *tabla* player to perform with minimal effort, so can a poor engineer disrupt the flow of a performance. "So, there are two things; you worship when you are in a trance. You worship and that happens when you have good sound also" (Satyaprakash Mishra, 2023). However, Satyaprakash Mishra goes on to explain that when the opposite is true, he cannot perform to his greatest ability and the energy of the performance will be diminished. Another performer suggested that there is a problem of overconfidence in engineers in India: "If they are incompetent then it ruins your sound and makes you feel like you are bad or makes you lose confidence" (pers. comm., 2023). The similarity in these comments is not in any notion or desire for unmediated performance, but rather a frustration with the engineering provided by the audio engineer. Frustration with audio engineering typically revolves around discussions of loudness, balance/imbalance, poor engineering skills, and poor equipment; therefore, this next section will analyze and introduce these separately.

Loudness as (Status) Balance

The tabla *soloist sitting on stage under bright lights is slowly rotating their* dayan *and hitting the pegs with their hammer. The harmonium player is meanwhile playing*

notes in the raag while emphasizing the "sa," or tonic note that the tabla *soloist is tuning to. The harmonium is quiet but audible – at least when it plays alone. The sound from the* tabla*, however, overpowers the harmonium every time "na" is struck, the stroke that is used to gauge the drum's tuning. I look around the audience. The front row is occupied by fine-dressed men and women in* saris *and* kurtas*. I assume them to be important, probably close friends or mentors of the soloist. Behind them, audience members shuffle in, the concert was supposed to begin fifteen minutes ago. But the auditorium is on the outskirts of the city; the jam on the main road prevented auto-rickshaws, cars, and bikes from reaching on time.*

As the tabla *artist moves their drums towards themself to begin the concert, I look around once more. This time I am looking for an audio engineer. I have seen setups in India with the engineer on stage or tucked away in a corner. I began to wonder where they were this time. As the sound continued to ring out at piercing levels - just* tabla *and harmonium on stage - I put my earplugs in and spotted the console. But no one is behind it. Even though the sound of the* tabla *is loud, its tone and timbre are resonant. As the soloist reaches a climax in volume, the sound does not distort. I can hear every scrape, tap, and subtle stroke on the drum as if I am sitting directly in front of the drums. But the beauty is not complete without the structure provided by the* lehra *(repeated melody) played on the harmonium. After some time, a man (who I later found out was the soloist's guru) asked for the harmonium volume to be raised. The engineer moved the fader, but the increase in volume had no effect. As this performance of "*thoda aur chhaahie*" ("should be a little more") and "*theek hai ji*" (ok sir) went on, I began to wonder*

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whether the soloist, engineer, or harmonium player was the reason for this volume

discrepancy… (Field note, 9-18-2023).

Typically comments about loudness are concerns of balance between instruments rather than overall volume. As demonstrated in my field note from a performance in Jaipur, the high volume of the *tabla* was less of a problem than its overpowering relationship to the accompaniment since the instrument's sound did not distort. The discussion of the power dynamics between the soloist and accompanist will be presented later, but this excerpt demonstrates the necessity for balance between the performers on stage. Without the use of amplification technology, the performers are accustomed to balancing themselves, but with the addition of microphones and a sound system, these musical decisions are controlled by an external individual who becomes a representative for the performers. The separation between the sound heard by the performers on stage and the sound in the audience further compounds this problem since musicians can only balance according to what they hear. If the sound was balanced on stage, then they would have no reason to adjust their approach to their instruments. If the sound is unbalanced in the hall, the engineer must then make the musical decisions about how the instruments should be presented. Balancing issues often resulted in concert reviews that suggest dynamic imbalances to be in the engineer's domain rather than the performer's: "The microphone for the *tabla* was too loud. As a result, the soft tone of the *santūr* was drowned by the boom of the *tabla*" (Rao 1982, 4). This review does not state that the *tabla* player was playing too loud but rather inculpates the audio engineer for the volume discrepancy because of the microphone imbalance. An earlier reviewer in 1976 explained

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that "microphone adjustments were terrible throughout, and the balancing of the programmes [sic] was left to the performers" (*Times of India* 1976, 7). This review suggests the agentic power of the musicians in balancing their sound, but similarly directs blame towards the engineer who did not balance the instruments themselves. In this case, despite their ability to stage balance, the musicians' sound was still not correct, and the fault remains in the hands of the engineer, according to the critic. This discussion demonstrates the roles of performers and engineers and the problems that arise in the field of interactions. These disturbances are manifest in sound but are negotiated in terms of a live sound culture that interacts with the many human and non-human actors through gear, instruments, ego, and as explained later, through knowledge.

The Power of Equipment

This discussion highlights the implications of control and agency afforded to engineers, performers, or technology in the discourse surrounding microphones and Hindustani classical musicians. Technology acts upon the user not in predetermined ways, but in ways that develop and change according to the histories, narratives, experiences, and interactions between technology and the individual. In this sense, technology is understood and interpreted differently in different times and places. As demonstrated by Eliot Bates and other proponents of Actor-Network Theory (ANT), technology functions in social fields and should be analyzed in the same manner as a human actor, to bestow upon it the agency that it deserves (Bates 2012, 372). The engineer maintains agency by determining how to utilize the technology, but the technology similarly informs the user about alternative approaches. This conceptualization imbues a level of technological determinism that understands the

technology to be in control, with the user relinquishing agency to the equipment. By affording agency and control to technology, issues of loudness are redefined in terms of power and quality of amplification processes. To avoid the binary between the agentic power of the user and the agentic power of the technology, I will instead focus on the ways the human and non-human actors co-construct meaning. Audio technology does not force hegemonic structures on the user but rather affords the user opportunities and techniques to interact with the world and sounds around them in new ways.

One result of the amplification of the "subtle aspects of *tabla*" is that of overamplification, where processes that are beneficial and capitalized on by performers in one situation are recontextualized in a different situation to produce unwanted byproducts. Discourse of loudness often coincides with the moniker "louder is better." Somashekar Jois, percussionist and engineer, explains that artists are "only worried whether their voice is being heard, not whether it is heard well […] It is being tested only for loudness. Good sound is now only about amplification" (Sridhar 2017, n.p.). This quote demonstrates that artists equate good sound not with timbral quality but rather with its ability to project, that is, with the abilities of the sound system. This discussion appears to be an antithesis to the practice of utilizing amplification capabilities for the purposes of tone enhancement or technical facility. Instead, in this instance sound is judged for its ability to be projected and disseminated to larger crowds; in effect, the sound is equated with the power of the technology.

Bracher, the engineer for Darbar Arts Culture & Heritage Trust, an organization that produces high-quality performances mostly in the U.K., expressed a similar viewpoint when he stated,

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> A lot of concerts that I go to nowadays are way too loud for me. Instead of subtle and lovely things, the noise [is] such that people [can't] even talk while it happens…where it really should be so that they all have to hold their breath to make sure they don't miss anything. (Imtiaz, n.p.)

This quote highlights his aesthetic conceptualization that sound should be valued in terms of its dynamic range, through its intimacy rather than the overwhelming power of loud sounds to engulf an audience. However, Bracher's statement also suggests a preference for a timbral quality similar to a *baithak* or small sitting room where musicians and often expert audience members (*rasika*s) are in close proximity. In this setting, sound is not judged on the quality of amplification, but rather on the musical content and the interactions between performer and engineer. Bracher does not value the ability of the technology to amplify loudly, but rather the nuanced ways in which an engineer or performer utilizes the technology.

The *baithak* listening environment is further supported by historical comments, such as;

> With the development of the concert idea in our country, they have unfortunately turned to the microphone and the loudspeaker. What the audiences hear today is a badly distorted version of their voices blaring out at twenty or more watts output. (*Times of India* 1953, 2)

This quote presents an opinion where timbre and "fidelity" are valued rather than only the pitch and rhythm content. Instead of turning towards amplification technology, critics have suggested the development of performance techniques that will allow for acoustic amplification by increasing the physical output of instruments or the voice. This is in apparent opposition to amplifying the quiet and subtle aspects of the instrument using amplification technology. Both approaches – developing louder techniques to avoid amplification, or using amplification to perform quieter techniques – require the

performer to adapt their approach to the instrument. As discussed earlier, to amplify quiet

drum strokes, the performer must also reduce the volume of their loudest strokes to avoid

distorting the sound system. This compression of dynamics is similarly seen in the

argument for developing projection techniques, where subtle techniques are forgone to

rely on loud projecting strokes, similarly restricting the dynamic range to a higher

volume. The change in both examples is that of space. The movement to larger audiences

and larger spaces necessitates the development of new approaches. While technology

might be blamed for the diminished sound quality, the increased size of performance

space should be understood as the impetus for this change.

By blaming technology for poor audio quality, one is also accepting the agency of

technology and its ability to exist as a social actor. Some performers explained that

musicians with a loud touch or a powerful voice are difficult to attenuate with the sound

system and hence troublesome to mic because of the performer's inability to change their

approach when performing with a microphone. The inability to attenuate one's

performance techniques to befit a sound system remains an issue that has historical

precedent, such as in the following 1958 concert review:

> The effect of this factor becomes most notable in the case of the more vigorous of
> our vocalists. They cannot give the microphone the somewhat considerate
> treatment to which it responds best; and the microphone, in its turn, feels no
> qualms in translating their vigour [sic] (which would be impressive on its own)
> into a harshness which is a little hard on the ears. (Our Music Critic 1958, 5)

This further suggests that the microphone has control of the sound rather than the

engineer when an artist produces harsh timbral or high-volume sounds. Other musicians,

however, maintain that agency is in the hands of the human actor, stripping the agentic

power from technology. Satyaprakash Mishra explained, "I normally ask him, keep it

subtle, okay? No one should come in the audience. No, not one single person should come and say it's hurting my ears. Yeah, yeah, it should be subtle" (Satyaprakash Mishra, 2023). This statement recognizes the role of the engineer rather than relegating control of volume to technology alone. The next section will discuss control and power as manifest in performance practice, interpersonal interactions, and technological determinism.

Why So Loud? Performer, Engineer, and Organizer

Many contrasting answers were given to me when I asked performers and engineers what the reasons for unbalanced performances might be. Often, performers and engineers discussed the desire to know (read: hear) and have control of the sound in the hall rather than only the sound that they could hear on stage. This desire was sometimes a result of mistrust in the sound engineer, who they believed would not accurately represent their sound in the hall. This disconnect between how sound is experienced in the different locations within the performance venue can lead to improper balancing on stage. In his book, *A Life in Music*, Zakir Hussain explains, "I wanted to hear the sound as loudly as it could be heard in the hall" when he was a younger performer (Hussain and Kabir 2018, 152). The over-amplified sound on stage led to audio feedback and an overall lack of quality in the sound. The sound of Zakirji's *tabla* was separated from the physical entity when it was transduced by the microphone, and he was forced to relegate the shaping of the received sound to another person, namely the engineer. Zakir Hussain explained that this problem was not remedied until he began to trust his engineers, especially after working with Mujeeb Dadarkar. That is, Zakirji recognized his inability to control all aspects of his sound and realized that the process was shared and co-constructed by himself and Dadarkar. This conceptualization conceives the control of sound to be in

multiple domains that are controlled in relative proportion. While the sound is produced

by Zakirji, he mainly controls the domain of the stage sound, and the second field is the

audience sound which is controlled by the engineer. However, both of these sound fields

are determined by the processes of the other. The engineer alters the stage monitor sound

through mic'ing, processing, and positioning, while the performer is engaged in the

control of the hall sound through his performance practices. This entire interaction re-

engages with itself through the shared representation of sound on the stage affecting the

shared representation of sound in the hall and vice versa.

The efficacy of this feedback loop of influences and reactions is determined by

the cooperation of engineers and musicians, in the domain of physical sound and

electrical signals. The ability to hire and work with the same engineer is often restricted

to performers of a certain level of fame. Zakirji expresses that his relationship with

Dadarkar has allowed for his "hall" sound to reflect how he hears himself, making it

possible to suspend his desire to control this sound field. Zakir Hussain explained that

"most engineers think it's fine if it's loud" but that Mujeeb Dadarkar listens to the tone

and other elements of the sound to accurately mix his sound (Hussain and Kabir 2018,

152). This comment further inculpates the engineer for poor timbral and audio quality.

Historic concert reviews similarly reflect this direction of blame:

> One of the features of Tuesday's session was the misuse of the microphones. The
> one on the stage was extremely noisy. Perhaps a misguided member that by
> making the stage mike as loud as it was the occasional toll of the temple bell
> situated just behind the stage, could be smothered. (Our Music Critic 1957, 3)

Interlocutors in Delhi described instances of improperly trained engineers

operating sound systems, typically for lower-cost events. It should be noted that most

big-budget performances and festivals are run by skilled audio engineers, but lower-budget concerts can vary in experience levels. In high-budget events, poor sound quality was attributed to "the ego" of the engineer or performer rather than a lack of proper gear or training. Anindo Bose described engineers as "operators" if they overly rely on the readings of the console rather than the heard sound or opinions of the performers (pers. comm., 2023). This reflects a wider trend in audio engineering throughout the industry, between the practice of "listening with your eyes" and the more "musical approach" of adjusting levels based on the sound that is heard. This discussion is too broad to be addressed properly in this thesis: instead, it is presented to contrast with other accounts of blame. The control and reliance on the console suggest that these "operators" understand control to be held by the technology rather than themselves or the musicians. Operators relinquish their agency in determining the construction of sound to the domain of meters and displays. The modes and operations of the console determine the production of sound, and the gear "drives" the performance.

Akhram Khan, a *tabla* player in Delhi, explained that concert organizers should instead be blamed for poor sound quality because they hire inexperienced audio engineers. This answer came to a question I posed to him after attending a music conference in Delhi where the poor sound quality resulted in an abrupt pause in performance and very tense reactions between organizers and the engineer. This sentiment has been echoed in concert reviews such as in 1957,

> Right through the festival and particularly on the concluding day, the microphone arrangements were unsatisfactory […] for such an important musical event, the organisers [sic] should have engaged the services of a qualified sound engineer. (Our Music Critic 1957, 3)

Jois explained that,

> Organisers [sic] need to recognise [sic] the value of a trained audio engineer. Hiring sound equipment is different from hiring sound engineers […] I know of drivers and peons manning sound systems. This will result in sound comparable to election loudspeakers! (Sridhar 2017, n.p.)

These comments display the power of engineers in creating a sonic representation on stage but inculpate organizers as the actors who maintain the power to control this aspect of the live sound cultural field.

Khan *tabla* player explained that engineers need to know both the weight of the *tabla* player's hand (*wajan* or vazan) and their own instrument, namely the console (Akhram Khan, pers. comm., 2023). However, others explain that technical competency must be extended to performers and organizers too.

> Today classical musicians have to be aware of the right kind of instrument pick-up or microphone to use. But *sabha*s [assemblies] are more concerned about the name of the artiste they invite rather than what kind of sound they are offering to the audience. (Kiran quoted in Sridhar 2017, n.p.)

In addition to musicians' understanding of technology, this quote further inculpates *sabha*s in their control over the sound of performers. As demonstrated in the above discussion, discourse regarding the sound quality of performances is redirected and interpreted in contrasting and conflicting ways. The process of producing a sonic character of the *tabla* is equally shared by all involved in domains of relative control and power. Analyzing the discourse surrounding blame for "bad quality sound" can reveal how different actors in the process recognize the distribution of power and agency. The next section will expand on how power and control are negotiated in performances between engineer and performer or performer and performer in the realm of technological knowledge and technological practices.

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Negotiating Control and Power

       Interpersonal relations and communication are continually stressed in discussions regarding *tabla* performances and audio engineers, where poorly engineered sound can cause a performer to second guess their skill (Mike pers. comm., 2023). *Tabla* performers and engineers co-produce a performance in sometimes less-than-ideal circumstances where one or the other may only arrive ten minutes before the performance (Satya Prakash Mishra, 2023). Mutual trust and understanding are emphasized as determinants for cooperation between performer-engineer, as represented in the relationship between Zakir Hussain and his audio engineer Mujeeb Dadarkar. Confidence in the abilities of the sound engineer allows the performer to separate themselves from the production and reception of sound in the hall, to instead focus on the domain of the stage. However, often the relationship between engineer and performer is fraught with tension, as Satyaprakash Mishra explained, even if "they [recording engineers] understand [*tabla*], many times they are over smart, they think they are the best" (2023). In this situation, performers often demonstrate their own knowledge of audio engineering skills, to gain power through an expression of the types of knowledge that are valued by the engineer. This articulation of technological capital is expressed in the usage of specialized vocabulary by performers to define sound quality and the use of technical jargon to present themselves as knowledgeable of audio engineering equipment and processes.

       In a relationship between a performer who is understood as engaging in cultural and artistic expressions of capital and an engineer in a technical domain, the two sides often claim power through knowledge of the other's field of expertise. In her ethnography of South African recording studios, Meintjes explains that "some musicians work at

improving their own technological skills" to challenge the power held by the white recording engineers in the studios (2003, 107). A similar desire to improve "technological skills" is paralleled in Zakir Hussain's experience of learning to work with microphones and finding "the kind of frequencies that worked best for Indian instruments" (Hussain and Kabir 2018, 149–150). Zakirji's explanation of the "frequencies that worked best" continues by demonstrating a basic understanding of technological equipment such as graphic equalizers and by citing specific frequency ranges.

> By enhancing, say, 800 Hz on the graphic equalizer, I was able to lengthen the resonance of the *tabla*. And adding 120 Hz to the *bayan* made the bass sound more round and deeper, gave it much more punch. (Hussain and Kabir 2018, 150)

Audio engineers typically avoid generalizations such as the one presented by Zakirji since applying equalization to memorized frequency bands is often not beneficial to every situation. Nevertheless, these statements represent Zakirji's understanding of equipment, technological terminology, and his claim to technological knowledge. Zakirji lists many other great artists and explains that they too were able to "be subtle and use the sound system to bring out the best possible tones with the least possible effort" (Hussain and Kabir 2018, 150).

Other musicians with whom I spoke also emphasized their understanding of audio engineering techniques, such as Satyaprakash Mishra: "I can fix that. I know how much bass I know highs. I know I don't want low mids. I don't want high mids, a little bit of reverb" (2023). Performers present themselves as knowledgeable and in control of the type of discourse that is valued by engineers. Similarly, performers can directly control the sound of their drums by physically moving the placement of the microphone. Although the approach to mic'ing *tabla* is debated extensively, *tabla* are often mic'ed

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with one microphone or a stereo pair placed between the two drums so that the performer is in control of the balance of the instruments through their adjustments to the relative loudness of each drum. However, if a microphone is too close to one drum or the other, then that drum will gain volume and the balance will not reflect the artist's playing. "So, I change my microphone position. So, if I see that my *chanti* [right-hand drum] is too sharp, I just try and divert it [the microphone] towards my *bayan*" (Satyaprakash Mishra, 2023). The angle and distance to the drum where the microphone is positioned can be attenuated by the performer to reflect their desired sound, whether it is pointed towards the playing position on the right drum for a sharper attack or angled away for a more "mellow" tone.

Engineers also suggested that musicians often misuse or incorrectly demonstrate their purported control over technological knowledge. Musicians will know the words of effects but not know what they do, they will often say compress this or add an extender to that (Anindo Bose, pers. comm., 2023). Performers learn to replicate the discourse of audio engineering but sometimes misinterpret the signs and meanings of the terminology. One engineer explained, "They always want more lows and highs and the volume to be louder" which practically raises the volume through an increase in the amplification of a large frequency range (ibid.). "I feel most of the time they [are] not able to gauge if something softer needs to be turned up or the louder stuff turned down" (ibid.). This explanation demonstrates that the usage of technical terminology does not always translate to an increase in technological capital.

Power and status between musicians on stage are furthermore played out through mutual interactions in the domain of technology. The role of *tabla* performers has

developed from performing either in the role of a "passive accompanist" or "combative

accompanist" (*larant,* simultaneous improvising), to an "alternating style of

accompaniment" where soloist and performers are both afforded opportunities to

demonstrate their skill (Kippen 1988, 42). Deference to a soloist as an accompanist is

usually accomplished by the act of performing at a lower volume during the soloist's *upaj*

or improvisation, but what happens when the performer is no longer in control of their

relative volume in relation to the soloist?

In a 1970 review of Banaras *tabla* performer Pandit Shamta Prasad and Kathak

dancer Roshan Kumari, the reviewer wrote,

> Pandit Shamta Prasad's *tabla* solo – sorry, Roshan Kumari's Kathak dance
> performance – […] proved an enjoyable experience. The veteran percussionist
> from Banaras, with the microphone placed so close to his drums, sounded almost
> as if he was playing solo with his many uninterruptable sallies he attempted. (Our
> Music Critic 1970, 3)

Despite Pandit Shamta Prasad's veteran status, he was performing in the role of an

accompanist, but his relative volume overwhelmed that of the kathak dancer. In this

instance, deference was not paid to the soloist not because Pandit Shaamta Prasad did not

attenuate his playing but because the engineer placed the microphone too close to the

drumhead. The sound of the *tabla* was "uninterruptable," and notions of status were

relegated to the control of the audio engineer rather than the performers themselves. The

usage of the term "uninterruptable" suggests an overwhelming power as asserted by the

amplification technology and the engineer, where the performer loses agency in altering

their sound.

During a concert of two famous Hindustani classical musicians, Ravi Shankar

(*sitār*) and Zakir Hussain, in 2006, discussions of the changing role of *tabla* played out in

a disagreement regarding the balance between soloist and accompanist. Zakir Hussain

was upset about his sound during the performance. Zakirji "had indicated to the sound

technician that the volume of his microphone should be adjusted, but apparently this was

not done," in response, Zakirji "yanked the microphone from his stand" (TNN 2006, 1).

Ravi Shankar later condemned Zakirji's behavior and said,

> These days some artistes play fusion music and suchlike and are used to loud
> music. I like the sound of the accompanists to be about 20% lower than the
> volume of my *sitār*. This is the standard practice. (ibid)

In Ravi Shankar's response, he suggests a "standard practice" in which the soloist is

amplified to a higher level than the accompanist, and in use of the term accompanist. In

implicating Zakirji's actions to his playing fusion music, Ravi Shankar is similarly

suggesting that volume discrepancies are changing because of changes to Indian classical

music. Performers who "are used to loud music" are amplified through the mediation of a

sound engineer and sound system which seems to be at odds with an aesthetic that prefers

the intimacy of a small *baithak*. Volume becomes a substitute for larger discussions of

socio-musical balance. Complaints of volume are not about volume but rather

interpersonal and inter-musical relationships that are disrupted by the mediation of audio

recording technology.

Chapter Four: Conclusion

The discourse surrounding technology and *tabla* can be categorized in contrasting and contradictory ways regarding mediation, corruption, agency, and technological determinism. The rift between acceptance of amplification technology as a means to disseminate volume and information versus the disdain for poor quality engineering appears in the current practice of foregoing microphones altogether, where "the absence of a microphone has become a way of life for the young hopefuls" (Burde 1993, 10). The Acharya Pandit Ram Narayan Foundation, which sought to "eradicate the evils that have corrupted" Hindustani classical music, is against how the microphone affects the tonal qualities of music: "We all know how this demon disrupts a good concert" (*Times of India* 2000, 4). Frustration with technology typically revolves around difficulties in interpersonal relationships between engineer and performer ("over-smart") or definitions of power and agency that result in performers using or misusing technological jargon to claim power. The problems surrounding this discourse are further exasperated in a field that is predominately controlled using English or heavily Anglicized Hindi (Anindo Bose, pers. comm., 2023). Bracher, a British engineer for Darbar, expressed in an interview that "an Indian classical musician may not use English in the same way as a native British speaker and [may continue] asking for the sound to be 'louder' whereas really, he or she may mean they want to hear themselves more clearly" (Imtiaz, n.p.).

Furthermore, the construction of timbre is broadly accomplished through the cooperation between the performer, engineer, technology, organizer, and audience. Musicians, however, constantly recognized the possibilities of utilizing the amplification capabilities of a sound system to enhance the subtle aspects of their instruments. Disjuncture in audio production arises when one facet of this web of interactions is broken, such as when "star artistes [sic] are commissioned, often paying them a fee of several lakhs of rupees, but they play or sing with atrocious acoustics and audio equipment" (Sridhar 2017, n.p.).

> I discovered the kind of frequencies that worked best for Indian instruments and how they could sound better by using equalizing graphics. So, naturally, I brought that information to the engineers who were amplifying the concert halls back in India, and when that happened, it allowed me to play my instrument differently. (Hussain and Kabir 2018, 149)

Performing by utilizing the capabilities of the sound system then works as a feedback loop, where other musicians and engineers reference the sound and technology used by recognized high-status performers as a claim to lineages of sound, a sort of new *gharānā*. The interaction between cultural capital and technological capital results in the production of a reified auditorial representation of an instrument, its performer, and the histories and lived experiences surrounding it.

> Music production technology and the discourse on technology act as gatekeepers: those who lack full access to technology will not be able to participate in the definition of musical aesthetics. (Nardi 2011, n.p.)

Recognizing the role and relationship between technology and performance can deepen discussions regarding tradition, *gharānā,* status, and performance practice. The rise in the socio-musical status of *tabla* performers from low-status accompanists to respected soloists is difficult to attribute to one factor, but Kippen depicts this change in

relation to developments in the performance roles of *tabla* players, the emergence of university courses that removed the control of hereditary (often Muslim) musicians on musical knowledge, and the "Zakir factor" as an idolized performer to be emulated (1989, 44). The rise in popularity of *tabla* is paralleled by the acceptance and capitalizing of the capabilities of audio technology. Zakir Hussain explains that *tabla* players were forced to travel by trains while the main artist traveled by air, but "that all changed in my father's time […] it took about twenty years to get to a point where I could ask for something, tell the organizers that I needed this or that" (Hussain and Kabir 2018, 18).

Audio technology is intimately entwined in the development, dissemination, and performance of most types of music. But the "live sound culture" of every genre, performance practice, and instrument is dependent on a large number of signs, histories, identities, and narratives surrounding it. To understand the "live sound culture" of a particular instrument, it is necessary to situate the physical and metaphysical object in the messy relation between these signs. The timbral signifier that is produced is both representative of and represented by all of these interactions and manifests in the performer and audio engineer's co-construction of the auditorial representation. The physical sound is produced by the performer, engineer, and space. This sound is then encoded by the engineer, who works in a collaborative space of interpersonal relations and lived experiences to amplify, record, or affect the sound. The final process is the audience's decoding and reception of the processes in terms of their own understanding of the surrounding signs and narratives. This thesis is presented as one step into the "thick description" of the "live sound culture" of *tabla.* It also recognizes the prospect of writing and theorizing on the "live sound culture" of other musical instruments, genres, and

performing practices to understand the messy networks of actors in the production of

sound. The varying discourse surrounding *tabla* demonstrates how issues of agency,

technological determinism, and performance practice are all constructed and restructured

through the interplay between engineer, performer, critic, and audio technology.

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