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Musical Connectivity in Sitar and Tabla Performance

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Abstract

The aim of this dissertation is to define and account for experiences of musical connectivity by exploring the relationship between joint musical action and social experience through a combination of ethnographic and empirical methods. Live sitar and tabla duo performance, in the *Hindustānī* tradition, forms the focus of the studies. Through its approach and scope, this research contributes to a broadening of knowledge and understanding of how people play music together, and experience varying feelings of ‘togetherness’ while doing so, from an interdisciplinary, non-Western perspective.

The dissertation first considers the various musical and social concepts and behaviours that characterize *Hindustānī* performance. This is followed by an in-depth analysis of a commercial recording by master musicians Pt. Nikhil Banerjee and Zamir Ahmed Khan, in which the formal, rhythmic, and micro-temporal interactions are explored from a relational, socially-driven perspective. Lastly, qualitative and quantitative data collected through a case study carried out in Varanasi, India, involving close collaboration with expert informants Shyam Rastogi (sitar) and Sandeep Rao (tabla) together with the participation of five other local musicians are presented and discussed. Nine audio-visual performances were recorded, and performers were subsequently interviewed regarding aspects of their social experience whilst playing. Performances were then analysed in order to relate performers’ musical interactions with their self-reported feelings of sociality, both generally and at specific moments of their performance.

These various results are used to support a novel model of musical connectivity, based on (i) ethnographic insight gathered through fieldwork, (ii) formal and informal interviews with numerous Indian musicians, and (iii) the author’s auto-ethnographic account of his practice as a sitar student. This model and the phenomenological insights that it presents are explored in detail in the concluding chapter.
Music is widely recognized as powerful means of social bonding. It enables participants to express and induce shared emotions, explore social identities, attain optimal psychological states, and reinforce feelings of social belonging. Indeed, music can play a fundamental role in developing and sustaining social skills, relationships and communities. Yet at the same time, performers consistently report that social experiences accompanying musical performance may in fact vary widely both in quality and intensity, ranging from mild feelings of cohesion to overwhelming states of unity, as well as occasional experiences of disconnection and conflict. What makes music so special at promoting feelings of social togetherness, and what causes these experiences to vary so dramatically from one context to the next? More specifically, what is the relationship between musical interaction and social experience in ensemble performance, and how does cultural environment affect this relationship?

Clearly, the answers to these questions are largely dependent on musical genre and context. This dissertation addresses these issues from an ecologically-valid and non-Western perspective, by focusing on the specific case of live North Indian sitar and tabla duo performance. The goal of this research is to find out how positive feelings of musical connectivity are generated and shaped - or sometimes inhibited – according to these performers’ varied musical interactions. In addition, it also explores what musical connectivity in sitar and tabla performance feels like and what these experiences mean to the performers who experience them. These questions are approached in an interdisciplinary manner, combining philosophical theories of selfhood, consciousness and shared subjectivity; psychological models of social interaction; and both ethnographic and empirical methods of data collection and analysis. While focusing on a single musical scenario, this research contributes methods, models, and data by which to broaden our general understanding of this topic.
This investigation is framed around a psychological model which postulates specific relationships between certain kinds of musical interactions and certain kinds of social experiences. The application of this model requires familiarization with how North Indian musicians interact in the course of performance. This account is complemented by an in-depth analysis of a commercial recording by master sitarist Nikhil Banerjee accompanied by Zamir Ahmed Khan on tabla. The research then centres around a case study carried out in the North Indian city of Varanasi, involving close collaboration with seven professional performers. The study was comprised of nine live performances, during which performers were subsequently interviewed regarding their musical interactions and varied social experiences. These data were used to explore what kinds of contextualized musical interactions are more or less likely to underpin feelings of musical connectivity. Lastly, the insight acquired through this approach was interpreted according to the connectivity model to find out what kinds of social states are more characteristic and valued in this genre.
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The topic of this research would not have been conceived if it were not for the great friends I have had the privilege of playing music with over the years, and who have taught me some of the most important lessons in musical connectivity. Whilst working on this thesis I have always kept these happy experiences in the back of my mind, and have tried to capture some of their essence.

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Lastly, I am extremely grateful to my parents, David and Annie, for their endless support, and for encouraging me to pursue a career in music, and to my wife, Winna, for accompanying me along this often stressful journey, and always being willing to listen to my strange ideas whilst keeping me connected to reality.
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Transliterations

Most of the vocabulary used in discussion of North Indian music is drawn from Sanskrit or Hindi, both of which are written in the same script, known as Devanagari (Neuman, 1980). I have chosen to implement transliteration conventions set by the International Alphabet of Sanskrit Transliteration (IAST), which uses various diacritical marks to extend the alphabet (Moran, 2007). Transliterated terms are italicized throughout, and are listed in the Glossary.

Research Ethics Statement

This project was concerned and informed by principles of ethical research, as outlined by the College’s code of research ethics (https://www.ed.ac.uk/arts-humanities-soc-sci/research-ke/support-for-staff/res-ethics-policies/ethics) and complying with the CAHSS ethics checklist. Ethical considerations emerging from this project are discussed in p. 172.
Preface

Journeying together through the medium of performance, musicians assist one another in entering an incomparably intense realm of human experience where thrive diverse overlapping domains of sensitivity and knowledge: intellectual and “intuitive”; aesthetic and emotional; physical, sensual and spiritual; private and communal.


A Personal Note

There are few things in life I enjoy as much as playing music with other people. The reason I enjoy this so much is not really due to the outcome, but almost entirely due to the process. It is, literally, all about the time we share together, the journey, the experience itself. Some of my strongest experiences of ‘togetherness’ have come while playing music with others, and some of my strongest friendships have emerged from, and are continuously nurtured through, shared music making. This thesis was inspired, both in its inception and throughout its making, by these personal experiences, and by a desire to explore and give verbal expression to something that I, and probably many other musicians, feel but struggle to explain.

Although I have been playing music since childhood, my approach towards ‘musicking’ (Small, 1999) was for a long time highly individualistic. As a teenager I wanted to be the fastest guitar shredder in school. Later, when carrying out my BA at Berklee College of Music, I spent most of my time composing avant-garde classical music in complete isolation. I continued having the same approach towards music throughout my Master’s at the University of Surrey and into my first PhD at Royal Holloway. However, I slowly came to discover the joy of playing music - and
particularly improvising - with other people. While this might seem obvious to many, for me it felt as a true revelation! So much so that I soon decided to drop my PhD and move to Laos, where I hoped that by opening a musical guest house I would be able to play music freely all day without any material worries. Eventually, this proved somewhat unrealistic, but it did nevertheless cement my love for joint music making and gave me plenty of time to think of better ways to channel my new-found love.

During this time I also became increasingly interested in North Indian classical music, and especially sitar and tabla duo performance. The fact that my awareness and appreciation for what I would eventually call musical connectivity grew hand in hand with my appreciation of Hindustānī music was hardly coincidental. Sitar and tabla performances are normally extremely interactive. Musicians are constantly anticipating, complementing, and responding to each other in a variety of ways. When performers are highly familiar and attuned to each other - such as the famous examples of Panḍit Ravi Shankar and Ustād Alla Rakha, or Panḍit Nikhil Banerjee and Panḍit Anindo Chaterjee - their interactions seem at times almost telepathic. As I rediscovered music as a form of ‘freeplay’ (Nachmanovich, 1990), I became increasingly attuned to these astonishing musical interactions. I thought to myself: ‘if I can experience such intense pleasure and social unity with my relatively limited musical capabilities, imagine what they must be feeling while performing!’

With this idea in mind, I was eager to understand how Indian performers achieve such a high level of musical cohesion within an essentially improvised genre. Naively, I bought a pair of tabla drums, a few CDs, a book on how to play the tabla, and
Bagchee’s (1998) book on North Indian music theory, thinking I could teach myself the basics and then maybe go to a guru for further instruction. Although this was a rather confusing and ultimately unproductive approach, it consolidated my love for Indian music and my desire to learn more. Around this time I also came across Martin Clayton’s clear and insightful book on time in Indian music (2000), through which I came to fully appreciate the importance of tāl as a framework for achieving musical cohesion. However, none of these texts addressed the issue which I was most interested in; namely, the performers’ musical experience of sociality. I then came across Nikki Moran’s (2013a) paper on the social relationships among North Indian performers. Reading this text was a relief, as it was the first account I found in which performers acknowledged the importance of musical rapport. It assured me that the connectivity which I had perceived among sitar and tabla players was valid. It also meant I had found a PhD topic and, unbeknownst to me at the time, my supervisor.

While working on my PhD proposal I had the chance to travel to India and take tabla lessons from Keshava Rao Nayak. Although this experience proved extremely enjoyable and rewarding, I eventually came to the conclusion that - given my background as a guitarist and my attraction towards melody - the sitar would probably suit me better. After being accepted by the University of Edinburgh and arriving to Scotland I began taking sitar lessons from local sitarist Laurence Howells, and occasionally from his London-based guru Mehboob Nadeem. In the meantime, I was searching for my own guru and eventually came across Debashish Sanyal, from Varanasi. I was immediately attracted to his style of playing, and he luckily accepted me as his student. I have been learning from Debashish ever since. In addition,
whenever I have a chance to travel to India I also take singing lessons from Ashish Jaiswal.

During the course of my PhD I have continuously worked on improving my sitar-playing skills. I have had the amazing and rather rare opportunity (for someone at my level) of teaching a fair bit. I have also tried to rehearse and perform with tabla players as frequently as possible, thereby gaining first-person insight into the musical interactions and social experiences which underlie sitar and tabla performance. This gave me the chance to discuss several ideas with my accompanists as a way of ensuring that my research was not entirely biased towards the sitarist’s perspective. And more importantly, whenever I felt demoralized and unmotivated towards my PhD research, playing with others would always remind me of my topic’s inherent value.

In sum, this thesis grew out of a personal desire to understand a certain kind of heightened musical experience better, not only for intellectual reasons, but to allow me to experience this with greater frequency and intensity, and hopefully, help others do so as well. I therefore strongly encourage the reader to continuously reflect on his or her own musical experience, in whatever context that may be, and consider the extent to which what I say throughout this work resonates at a personal level. Ultimately, my wish for this thesis is that its intellectual content - which was inspired by my own musical experiences - finds a way of being rechannelled towards experience, both my own and others’.
Chapter One – On Musical Connectivity

For me, good music making or dancing is the realization of ideal – possible – human relationships where the identification with others is so direct and so intense that we feel, for those best moments, as if our selves have merged. It is the sounds that we are making, our art, that continually let us know that we have done so or that we are failing to achieve this ideal.


1.1 Introduction

Music is widely acknowledged as a powerful means of social bonding, and its ubiquity throughout human culture is normally associated with this capacity (Merriam, 1964; Blacking, 1973; Small, 1998). As a highly coordinated and expressive form of human behaviour, musical participation has been found to induce shared emotions, experiences, and optimal/altered psychological states (Becker, 2004; Juslin, 2005; Clayton, 2005; Overy & Molner-Szakacs, 2009; Gabrielsson; 2011; Turino, 2014), while allowing people to explore social identities, and both enact and reinforce feelings of social unity and rapport (Keil; 1994; Small, 1998; Turino, 2008; Dissanayake, 2009). However, ethnographic research also shows that the social experiences that permeate joint music making may in fact vary widely, ranging from mild feelings of cohesion to an intense sense of oneness, as well as occasional feelings of disconnection and even conflict (Berliner, 1994; Seddon, 2005; Moran, 2013a; Hart & Di Blasi, 2014, Clayton & Leante, 2015).

The goal of this dissertation is to contribute to our growing understanding of how people play music together and experience varying feelings of togetherness while
doing so, a phenomenon I refer to as musical connectivity for reasons explained in section 1.4. I explore this topic by focusing, on the one hand, on the actions and interactions by which ensemble performers co-create a cohesive and expressive musical performance, and on the other hand, on the performers’ experiences of social unity and cohesion that may or may not accompany their joint music making. More specifically, this research investigates the relationship between joint musical action and the varied social experiences that may be ‘brought forth’ (Varela, Thompson, & Rosch, 1991) by this shared activity. In other words, not only do I explore how people play music together, and what it feels like to play music with others, but fundamentally, I explore how these various social feelings are generated, shaped, promoted, and/or inhibited by performers’ contextualized musical interactions. These are complex, multifaceted questions, which therefore need to be addressed in an interdisciplinary manner.

Throughout this thesis, I examine the notion that while music is certainly capable of realizing ideal social relationships and powerful experiences of social unity, this realization depends – as Turino (2008) argues in this chapter’s opening quote – on the quality of the performers’ combined sounds. According to this view, the extent to which ensemble performers may feel as though their ‘selves have merged’ is strongly predicated on their combined musical actions, and by the extent to which these actions coincide with their shared sonic ideal. Although this statement may seem intuitively correct, we currently know very little regarding what kinds of musical interactions are more or less likely to promote such powerful social experiences, nor whether it is even possible to establish such a relationship in empirical terms.
Addressing this question may provide us with a more detailed understanding of exactly how joint music making generates positive social experiences, and moreover, why do these experiences vary so widely both within and across performances.

Clearly, the nature of this relationship is profoundly shaped by numerous factors, first and foremost of which are genre and context. Not only do musical sounds and behaviours vary widely across genres, but so do the cultural frameworks through which these interactions are interpreted and felt. Hence, this question needs to be investigated within clearly defined and ecologically-valid performative contexts. Out of the countless forms of ‘musicking’ (Small, 1998), I will explore the relationship between musical interaction and social experience by focusing on the specific case of live North Indian sitar and tabla duo performance. While focusing on one particular genre, I nevertheless hope that - due to our species’ shared biological and psychological needs and affordances - some of the conclusions arrived at through this research may ultimately offer insight regarding the phenomenon of musical connectivity across a wider range of musical scenarios.

Throughout this dissertation I explore the following research question:

> How does playing music with another person in the context of live sitar and tabla performance generate positive social experiences?

In order to answer this question, we need to consider several other related issues. First of all, the question demands some general investigation of what it is like to play music in this particular genre. What types of actions and interactions characterize this style? In what kind of social contexts do sitar and tabla
performances normally take place? And what are the musical concepts and cognitive processes that allow these performers to coordinate their musical interactions and maintain musical cohesion?

In addition, we must also consider what constitutes a positive social experience in this particular musical context. Musicking can clearly generate a wide range of possible experiences, and the appeal and value of these experiences may vary significantly across different musical scenarios. For instance, rock musicians may presumably value experiences of arousal and excitement, whereas orchestral musicians may value experiences of precise coordination and refinement. What kinds of shared experiences do North Indian musicians value the most? Having considered these various issues, we can then reframe the initial research question as follows:

Is it possible to identify, describe, and account for relationships between contextualized musical interactions and positive social experiences in this particular genre?

In other words, is possible to provide empirical evidence which may either support or refute a relationship between ensemble performers’ musical interactions and their concomitant feelings of sociality? And if so, what is the nature of this relationship in sitar and tabla performance? What kinds of musical interactions are more or less likely to generate positive social experiences in this genre? Conversely, are there any kind of situations or interactions that are likely to inhibit feelings of togetherness? Furthermore, how is this relationship affected by other contextual factors, such as performers’ previous social and musical relationships,
venue, audience, sound quality, and so forth? In order to answer these various questions, we must also consider one other issue:

*What is the most appropriate and effective methodology for investigating this possible relationship?*

The task of making subjective musical experience and its relation to musical interaction the focus of academic research poses several conceptual and methodological challenges, particularly in terms of how one collects and interprets relevant data by which to address and provide some insight on this rather elusive subject. Throughout this dissertation I combine philosophical theories on consciousness and selfhood; psychological theories of social interaction and cognition; and both empirical and ethnographic methods of data collection and analysis; all of which are framed within an effort to provide a phenomenological account of musical connectivity in this particular genre. One of the aims of this research is therefore to contribute models and methods by which to investigate the relationship between musical action and social experience from an interdisciplinary perspective.

Before going any further, it should be noted that the phenomenon of musical connectivity is in some respects highly personal and unpredictable, which makes it hard to analyse and describe in a comparative manner. For instance, there may be innumerable reasons why a performer may feel disconnected from his or her duo partner: from purely personal reasons such as lack of practice or physical stamina, to circumstantial reasons such as some previous conflict between the two performers. In this sense, the topic of musical connectivity would appear to lie beyond academic
reach. Therefore, an important point to make from the outset is that - while acknowledging the unique and ineffable quality of musical experience - my investigation is circumscribed by empirically-recoverable patterns in the relation between musical interaction and reported social experience in one particular genre.

1.2 Why Indian music?

Admittedly, North Indian classical music might not seem to be the most natural choice for research on musical connectivity. After all, this genre places extremely high technical demands on performers (Neuman, 1980; Kippen, 1988; Neuman, 2012) and involves a clear distinction of musical roles (Napier, 2007; Clayton & Leante, 2015), both of which may arguably have a divisive rather than a unifying social effect. One may initially be more inclined to investigate this phenomenon in what Turino (2008) describes as ‘participatory genres’. These are genres defined ‘by the ethical priority of involving as many people as possible in the actual acts of music making and dance, as well as by a distinct set of values by which the success of a performance is significantly judged by the degree of participation achieved’ (Turino 2009, p. 109). In contrast, ‘presentational genres’ such as Hindustānī music ‘mandate an exclusion of the less skilled for the sake of the audience’ (idem), which would suggest that less value is placed on achieving heightened states of social unity and cohesion, as opposed to achieving a more polished and refined performance.

There are nevertheless several reasons why I believe that North Indian classical music makes an appropriate, and in fact a very interesting, case to focus on. First of all, most
research in music psychology pertaining to joint musical action and its concomitant positive social effects tends to be based either on theoretical speculation (Keller, 2008; Overy & Molnar-Szakacs, 2009; Cross & Woodruff, 2009) or rather sterile laboratory contexts (Hove & Risen, 2009; Spiro, Schofield, and Himberg, 2013; Madison & Sioros, 2014), both of which are frequently conceived on the basis of some form of notated Western music. While insightful, these approaches tend to undermine music’s inherent social embeddedness, and may thus lack phenomenological accuracy. Providing a live, non-Western account of this topic can contribute towards a less ethnocentric and more ecologically-valid view on human musicality.

Secondly, although it might be true that inducing feelings of togetherness in North Indian music is rarely the primary goal of a performance – at least not to the same extent as in other, more participatory-inclined genres - there is nonetheless substantial ethnographic evidence that Indian musicians may often experience strong feelings of social unity and rapport while performing, and that the success of a performance is intrinsically tied to such positive social experiences (Moran, 2013a; Clayton & Leante, 2015). Musical connectivity is thus a matter of great significance, both as a catalyst and as an outcome of what musicians and audiences are likely to judge as a good performance. Research on this topic might therefore be of particular interest to both musicologists and performers involved in this genre.

Another aspect of North Indian music which makes it both an interesting and convenient case to investigate this topic is that performers’ actions are primarily
improvised. Although musicologists are increasingly inclined to think of composition and improvisation as two expressions of the same creative process (Nettl, 2013; Benson, 2003), there are nevertheless important behavioural and phenomenological differences between the two. In improvised music, each performer must continuously make a large number of musical decisions on the spur of the moment, and both other performers and listeners are witnesses to this creative process. This can not only bestow a performance with a strong sense of intimacy, introspection, and as Racy (1998) puts it, ‘creative ecstasy’, all of which can potentially promote social bonding, but in a more pragmatic sense, it also places greater stress on the performers’ capacity to quickly interpret and adapt to each other’s momentary actions.

It is my intention in this dissertation to show that the rather unique and effective way in which sitar and tabla performers manage to maximize the possibilities for both spontaneous and highly coordinated musical action is fundamental in allowing performers to experience strong feelings of social cohesion, and in making this genre a particularly fascinating case study on musical connectivity. Moreover, the fact that this music is primarily improvised suggests that – compared with pre-composed genres, in which musical actions are largely established in advance – there will be a larger scope of variability in musical behaviour across performances. Having a wider range of spontaneous musical actions makes it in many ways easier to explore the relation between such actions and their underlying social experiences. This task is also facilitated by focusing on musical duets, both because social feelings are generated by and directed towards a single co-performer, and because their joint
actions are likewise easier to analyse from a social, i.e. ‘relational’ perspective (see Chapters Two and Four).

Despite the highly interactive nature of Hindustānī performance, and the importance performers bestow on achieving musical rapport, Indian music research has been traditionally characterized by a focus on its social environment (Neuman, 1980; Kippen, 1988; Farrell, 2002), its historical development (Rowell, 1992; Sanyal & Widdess, 2004), and on elucidating musical concepts such as rāg and tāl (Sorrell & Narayan, 1980; Bagchee, 1998; Bor, 1999; Clayton, 2000; Jairazbhoy, 2011), without minute consideration of how musicians enact these various factors conjointly throughout a performance, or of how this process may shape their experiences of sociality. Having said so, this trend has changed significantly over the past decade or so, since Indian music researchers have begun to pay more attention to this music’s interactive and phenomenological characteristics.

For instance, Laura Leante (2009) and Matthew Rahaim (2012) have investigated the role of gesture in processes of musical expression and pedagogy, as well as in the transmission of musical style and lineage (i.e. gharānā). Dard Neuman (2012) has explored how North Indian music’s pedagogical (i.e. riyaz and tālim) and creative processes tend to promote non-agentive, ‘de-subjectified’ states of mind. Clarke & Kini (2011) have made a somewhat similar point – applicable to both performers and listeners - by reference to the spiritual and philosophical notions within which this music is embedded. Meanwhile, Napier (2007), Moran (2013a, 2013b), and Clayton & Leante (2015) have discussed numerous factors shaping social relationships
between Hindustānī musicians – such as musical role, gender, and seniority - and have described how these factors are enacted in musical performance.

This recent turn in Indian music research towards a more enactive, embodied, and phenomenologically-nuanced perspective on music making is part of a broader trend encompassing various strands of research across the entire musicological field (see Seddon, 2005; Gritten & King, 2011; Rahaim, 2012; Doffman, 2012; Clayton et al., 2013; Leman & Maes, 2014; Moran, 2014; McCaleb, 2014; Schiavio, 2014; Schiavio & Hoffding, 2015; Hart & Di Blasi, 2015). As Clayton, Dueck, and Leante (2013) explain, this new line of research ‘defines music as the moment of production’ and focuses its attention ‘away from the ideal and towards the phenomenal’ (p.1). Together, these works have gradually overturned individualistic and mental models of joint music making in favour of an emergent, socially-embedded, and physically-grounded perspective, thus offering more promising models for investigating how positive social experiences are brought forth through musical participation.

The purpose of this research is to further this emerging model by exploring more nuanced ways of relating musical interactions with specific kinds of social experiences, within the context of live sitar and tabla duo performance. In doing so, this research aims to contribute a more detailed understanding of the actions and interactions that characterize this musical genre, and how feelings of sociality are shaped both by these interactions and the socio-cultural environment within which they occur. At the same time, this research also addresses broader issues regarding the manner in which musical participation can bring forth feelings of social unity,
cohesion, and rapport, as well as the manner in which music researchers should go about investigating this topic.

1.3 Why music?
In order to find out how playing music with another person in the context of a live sitar and tabla performance generates experiences of social cohesion and rapport, we must begin by momentarily stepping back and considering how any kind of musical participation generates positive social feelings; not only in sitar and tabla performance, but in ensemble performance in general; and furthermore, not only for performers but also for listeners. After all, we should not forget that performers are also listeners, which means that theories which account for listeners’ musically-induced experiences of social togetherness may offer valuable insight regarding performers’ experiences too. Likewise, although the musical concepts, sounds, and behaviours that characterize Hindustānī performance are particular to this style, the underlying mechanisms which enable joint musical action in the first place – and which presumably allow for concomitant feelings of social cohesion to emerge - are largely the same throughout any kind of ensemble performance.

The following review consists of three sections. The first section introduces some broad theories regarding music’s communicative capabilities and limitations, which apply both to listeners and performers. The second section focuses on how musicking allows for highly coordinated patterns of action and attention among participants, noting the important role this plays in promoting feelings of social unity and cohesion.
The third section discusses current research regarding the mechanisms of social cognition which enable ensemble performers to act cohesively. I therefore start from a rather general, passive, and somewhat disembodied account of how music brings forth positive feelings of sociality, and progress towards a more participatory and enactive account of the behaviours and cognitive processes underlying joint music making and the shaping of social experience. Reviewing the current literature on these various issues provides partial answers to this project’s central question: namely, how does playing music with another person in the context of live sitar and tabla performance generate positive feelings of sociality? At the same time, the review reveals gaps in our understanding of this topic which this investigation seeks to address, situating the current dissertation within its broader field of scholarship.

1.3.1 Music and Communication

I began this chapter by noting the ubiquitous role that music plays in promoting feelings of social unity and cohesion among human beings. But why? What is special about music as a social activity? In other words, how can music foster positive feelings of sociality in a way which few other activities arguably can? One way of approaching this question is to compare music and language. After all, both essentially consist of sonic events and physical gestures ordered in time. They also share common structural principles such as combinatorial syntax and intonational phrasing (Brown, 2000), leading Brown and others (Cross, 1999; Mithen, 2005) to postulate that music and language must have originated from a common communicative root, often
referred to by these authors as ‘musilanguage’. So why do we have - and probably need - both? Is language not a much more efficient way of communicating specific meanings and intentions, and if so, should language not suffice as a means for social bonding?

The idea of music as a communicative activity is both complex and somewhat contentious (see McGuiness & Overy, 2011; Schober & Spiro, 2013; Schiavio & Hoffding, 2015). On the one hand, music clearly ‘provides a means by which people can share emotions, intentions, and meanings’ (Hargreaves, MacDonald, & Miell, 2005, p. 1). On the other hand, music is largely incapable of communicating explicit semantic information in the way in which language can do so effectively (Cross, 2001, 2005). Moreover, the highly synchronic nature of musical participation (see section 1.3.2) does not fit the linear transmission models of communication – involving a sender, a channel, and a receiver of information – which have traditionally dominated psychological and cognitive research (Hargreaves et al., 2005).

Ian Cross (2005) has addressed this question by arguing that both language and music consist of different components of human’s communication toolkit, which are ‘distinguished as tending towards opposite poles on a continuum of capacity for specificity of meaning’ (Cross & Woodruff, 2009, p. 10), and which therefore makes them efficacious in different kinds of social contexts. Language allows people to express ideas, goals, and intentions in a clear and unambiguous manner. This provides enormous benefits when it comes to, for instance, dealing with environmental threats and resources as a social unit. Music, on the other hand, is
poorly suited at communicating precise semantic meaning, especially without lyrics or a specific conceptual background. And yet, unlike language, music can be meaningful in itself. In other words, musical meaning is primarily enactive and participatory (De Jaegher & Di Paolo, 2008; Clayton, et al., 2013; Schiavio & Høffding, 2015), grounded in our sensorimotor engagement with sound and the pleasure we derive from the activity itself.

In addition, Cross (1999) has also famously argued that music’s social value may lie precisely in its incapacity to communicate specific, unambiguous meaning; in what he terms music’s ‘floating intentionality’. As he points out, there are moments in which singularity of meaning can pose problems, particularly during moments of social uncertainty, in which disagreement over a certain issue can lead to conflict. Due to its inherent ambiguity and multiple potential meanings, music can act as ‘a consequence-free means of exploring social interactions’ (Cross 2001, p. 99), enabling various people to participate in the same activity without necessarily agreeing entirely on what the activity is about. In other words, music’s ambiguity of meaning may actually benefit social bonding by allowing each participant to explore and develop his or her own unique identity within a joint social activity (Turino, 2008).

Another way in which music seems to surpass language as a means of social bonding lies in its capacity to communicate emotions. There are, for one, numerous surveys evidencing music’s power of emotional expression (see Juslin, 2005; Gabrielsson, 2011). Moreover, research also shows that listeners tend to relate certain configurations of musical features (such as rhythmic patterns, melodic gestures,
timbres, dynamics, etc.) to the same or very similar emotions, which means that performers have a certain degree of control over the process of emotional communication (Sloboda, 2005; Juslin, 2005). For example, Clayton carried out a survey among both Indian and British participants regarding the ‘thoughts, feelings, images, or associations’ (2005, p. 369) elicited by an extract recording of a Khyāl performance of rāg Shree. He found that participants’ responses were not only consistent among themselves, but also with the singer’s own description of her expressive intentions, thereby supporting the notion of music as a fairly accurate means of emotional communication, even among people who might not share the same cultural background.

So how does music communicate emotions, and why is music potentially more effective at communicating emotions than language? This question entails a series of sub-questions which must also be addressed. First of all, what is an emotion? According to Juslin, emotions consist of ‘relatively brief and intense reactions to goal-relevant changes in the environment’ (2005, p. 90) which may manifest in the form of (i) cognitive appraisal, (ii) subjective feeling, (iii) physiological arousal, (iv) emotional expression, (v) action tendency, and/or (vi) emotional regulation. For instance, being attacked may result in judging the situation as dangerous, feeling scared, increased heart rate, screaming for help, running away, and trying to remain calm. Emotions are thus dynamic, integrated, mind-body states caused by environmental stimuli, and which ‘both prepare the body for action and impact on the functioning of perceptual and cognitive processes’ (Cross, 2005, p. 33). ‘Emotion, as the word indicates, is about movement, about externalized behaviour, about
certain orchestrations of reactions to a given cause, within a given environment’ (Damasio, 1999, p. 70). The intrinsic connection between emotions and embodiment is - as we shall soon see - key in understanding music’s emotional expression.

The next question is: whose emotion is music communicating? There are two reasons why this apparently simple question is actually rather complex. Firstly, research shows that musical emotions can often be ascribed to a wide range of potential agents, including not only the composer, the performer, and the listener, but also higher ineffable entities such as a God, or in the case of Hindustānī music, a rāg (Sloboda, 2005; Clayton, 2005; also see sections 3.4 and 6.5.3). Sloboda argues that this emotional ambiguity - or ‘emotional cue-impoverishment’ as he calls it (an idea which resonates with Cross’ notion of floating intentionality) - may actually be responsible for engendering profound, semi-mystical experiences. As he explains:

Our own subjective desires, memories, and preoccupations rise to flesh out the emotional contours that music suggests. The so-called ‘power’ of music may very well be in its emotional cue-impoverishment. (2005, p. 228)

The second reason why this question is more complex that it might appear is that, as Juslin (2005) rightly points out, in order to understand the process of emotional communication in music one must also distinguish between three related phenomena that may or may not coincide: namely, emotional expression, emotional perception, and emotional induction. For example, a performer might have the intention of expressing a certain emotion such as sadness. The listener however may perceive a different emotion, such as nostalgia, and furthermore, may personally experience yet another emotion, such as happiness. Not only are the cognitive
mechanisms underlying each of these processes distinct, but moreover, the kinds of emotions which may be induced in the listener are likely to be different to those which can be perceived by the listener. A listener may perceive a wide range of both positive and negative emotions, but will normally participate in a musical activity in order to personally experience a much narrower set of positive emotions such as enjoyment, arousal, happiness, and/or relaxation. Thus, I would argue that one of the key features which makes music a more powerful means of emotional communication than language is its capacity not only to express, but rather to induce shared emotions among participants - a process which is supported by music’s emotional cue-impoverishment and floating intentionality - and which thereby fosters shared affective states and feelings of social unity.

So, rephrasing our original question, how does music induce emotions? This is yet again a highly complex question, and as Juslin explains, there is unfortunately no ‘single theoretical mechanism that can account for all instances of musically induced emotions’ (2005, p. 104). However, among the many physiological, psychological, and cultural factors involved, musicologists generally agree that one of the most powerful and universal means by which music elicits emotions is by mirroring embodied emotional states (Blacking, 1973, 1995; Overy & Molnar-Szakacs, 2009). In short, this theory posits that when we play and/or listen to music our bodies resonate - either overtly or covertly - to the music’s various temporal and gestural patterns, as well as to the performers’ various actions involved in producing sounds (Cox, 2011). This view is naturally supported by the intrinsic relation between music and dance. Since, as we have seen, emotions are intrinsically tied to bodily motion and sensation
(Damasio, 1999; Juslin, 2005), this mimetic process can result in what Overy and Molnar-Szakacs (2009) refer to as ‘shared affective motion experience’, which may in turn promote a sense of social unity among participants.

Interestingly, this intrinsic relation between the perception of movement and the induction of affect appears to be largely based on the neurological composition of our brains. Neuroscientists report a close coupling regarding brain activity in perception and action, as some neurons have been found to activate both in the event of carrying out an act and in the perception of someone else carrying out the same act (Gallese, 2003). The discovery of these ‘mirror neurons’ has led to speculation that this neural overlap may be the basis on which we infer intentional behaviour in other beings, and may even be the foundation on which we experience empathy. As Overy and Molnar-Szakacs argue, ‘the representational equivalence between perception and action at the neural level may provide the basis for shared representations between self and other, enabling social communication and intersubjectivity’ (2009, p. 491).

In order to shed further light on the relationship between musical structure, induced emotion, and embodied, affectively-charged movement, it may be useful to conceptualize this relation in terms of regular (i.e. periodic) and irregular (i.e. non-periodic) motion, both of which are grounded in kinematic behaviour (Trainor, 2007; Todd, Cousins, & Lee, 2007). On the one hand, musical analysis and empirical research show we have a clear preference for music beats that fall within the range of 300 to 900 ms, with 600-700 ms as the range of ‘maximal pulse salience’ (London,
2004). This also happens to be the range within which we carry out many other periodic motor activities, most notably walking - which London (2006) equates with an andante or moderato tempo - and running - which he equates with allegro. Since different periodicities are inherently associated with different somatic states – for instance, fast periodicities feel naturally exciting while slow periodicities normally feel calm - music’s emotional quality is strongly determined by periodic variables such as tempo (fast, medium or slow) and metre (duple, triple or compound).

On the other hand, research shows that music’s irregular surface rhythms and melodic contours both mirror and are perceived as distinct physical gestures (Gritten & King, 2006, 2011). As Hatten (2006) explains, this is achieved by integrating various temporally-contiguous and functionally-coherent musical events into singular energetic gestalts with affective and/or communicative properties. Our representational capacity to map a gesture ‘onto any or all the sensory and motor systems (better understood as the integrative sensorimotor system)’ (idem, p. 2) means that a sonic gesture may be associated with an emotionally-charged kinaesthetic gesture. Hence, gestures are both perceived as energetic gestalts conveying intentional and affective information, and can be mapped onto, or associated with, other similar gestures belonging to different modalities (Cox, 2006). In simpler words, this means that when we perceive a musician carrying out a certain musical (i.e. rhythmic and melodic) gesture, not only are we capable of translating this sonic gesture into other modalities, most notably movement, but also perceiving it - in part - as if we would be carrying it out ourselves. In doing so, it induces in us the emotion we would normally associate with that particular kind of movement.
In summary, music is generally less capable than language in communicating specific semantic meaning. However, music’s inherent ambiguity of meaning may actually be one of the main factors that make it effective in promoting joint participation and feelings of social cohesion (Cross, 1999; Sloboda, 2005). In addition, music has a unique capacity to induce shared emotions by both mirroring and provoking affectively charged behaviour and bodily states (Blacking, 1973; Juslin, 2005). This mimetic process can be conceived in terms of regular (i.e. periodic) and irregular (i.e. gestural) motion, and seems to be grounded in neurological processes that provide the basis for shared social experiences (Gallese, 2003; Overy & Molnar-Szakacs, 2009).

1.3.2 Musically-Coordinated Action and Attention

Another important difference between music and language for the present discussion is that, whereas language normally requires having one speaker at a time in order to communicate effectively, music allows, invites, and actually thrives on joint and highly synchronized participation. Even though both music and language exhibit some degree of periodicity (caused by the occurrence of sonic events at regular temporal intervals), music’s periodicities tend to be more precise, consistent, and perceptually salient. This has enormous significance for music’s social dimension, since it enables both attentional and behavioural synchronization among social groups. In other words, music allows many people to attend to and participate in the same activity together and exactly - or almost exactly (Keil, 1994; see Chapters Four
and Five) - at the same time, without interrupting each other but rather intensifying the shared activity (McNeil, 1995).

The process whereby two or more people coordinate their patterns of action and attention to a common beat or periodicity is commonly referred to as ‘entrainment’. As Clayton points out, the concept of entrainment is essentially ‘an abstraction describing a process common to many different phenomena occurring at different scales of time and space, in both biological and mechanical systems’ (2012, p. 49).

Two components must always be present for synchronization to qualify as entrainment: (i) the oscillators or rhythmic processes must be autonomous, in the sense that they should both be able to continue oscillating if separated, and (ii) oscillators must interact, in the sense that a change in one oscillator (such as an increase in oscillating speed) should have an effect on the other oscillator (Clayton, Sager, & Will, 2005).

Entrainment is in many ways pervasive throughout nature. For instance, every organism on this planet adjusts its cyclical behaviour (i.e. its ultradian and circadian rhythms) to the planet’s daily and yearly oscillatory patterns. In addition, organisms may also manifest various forms of self-entrainment, such as the coordination of limb motion and breathing cycle while running (Clayton, Sager, & Will, 2005). On the other hand, the specific kind of precise yet flexible interpersonal entrainment which characterizes musical behaviour is almost entirely unique to the human species. As Merker, Madison, and Eckerdal (2009) point out, such behaviour is mostly confined to a few species of insects, frogs, and crabs, and is conspicuously absent in apes.
Humans, in contrast, have an innate and often uncontrollable tendency to entrain their patterns of action and attention, not only while musicking, but in all other sorts of periodic behaviour, such as walking, running, rocking a chair, etcetera. Given the wide ranging empirical evidence that interpersonal synchronization can often promote affiliation (e.g. Hove & Risen, 2009) and cooperation (e.g. Wiltermuth & Heath, 2009), it is very likely that humans evolved this unique capacity due to its social benefits (Mithen, 2005; Dissanayake, 2009). For instance, Kirschner and Tomasello (2009), designed an experiment to test whether young children (aged two to four) would be capable of synchronizing at an earlier age and with greater accuracy if the musical activity was carried out in a social context. Children were asked to drum along either with a human partner, a drum machine, or a recorded drum sound. The result was that children of all ages were seen to synchronize better with the human partner, suggesting that the human motivation to synchronize may be due to an innate tendency towards joint attention and shared intentionality, enabling us to learn from and cooperate with others more efficiently.

Given the fundamental importance entrainment has in allowing joint musical participation and thereby promoting feelings of social cohesion, it is worth describing it in some detail. In order to gain a better understanding of how musical entrainment works, we must begin by considering it from an attentional perspective. After all, physical entrainment to a musical beat is only possible through attentional entrainment, in that we must first be able to perceive and attend to a periodicity, and be able to anticipate when the next periodic event is going to happen, before we can synchronize our actions accordingly. What therefore distinguishes humans from most
other species is not the capacity for periodic motion, which is pervasive throughout nature, but rather the refined capacity for precise periodic attending among conspecifics, which, as we have seen, probably evolved from a drive towards social cooperation.

As Kahneman (1973) has shown, attention is a limited resource which involves effort. This is why we struggle to attend to more than one thing at a time, and why attending to a complex action or perceptual task feels more tiring. Since we cannot pay full and constant attention to every single event happening around us, we target our attention both in time and space. One of the ways in which this is done is by extracting invariants (Gibson, 1982) in order to predict both what is going to happen, and more importantly, when it is going to happen.

Over several decades, Mari Riess Jones and her collaborators have developed one of the most compelling cognitive models describing how people target their attention while either playing or listening to music (Jones, 1976; Jones & Boltz, 1989; Large & Jones, 1999; Large & Palmer, 2002). This model, referred to as ‘dynamic attending theory’ or DAT, posits the existence of internal attentional oscillators which are capable of entraining to periodic temporal patterns in the environment (see Figure 1 below). These attentional oscillators allow one to anticipate the temporal location of future events (i.e. when is something more likely to happen) and allocate attention accordingly (i.e. pay more attention during those specific moments in time). In other words, this process provides both attentional efficiency and precise temporal
expectancy, and is therefore crucial in allowing us to synchronize our patterns of action and perception to a musical beat.

**Figure 1** Attentional entrainment model. The circles represent recurring temporal events and the sine wave represents the increasing accuracy of attentional allocation (Large & Jones, 1999, p. 130).

Furthermore, while many other forms of human behaviour are also periodic in nature, music is special in that it often consists of several coordinated and mutually reinforcing periodic levels happening simultaneously. Music, in other words, tends to be organized and perceived in a metric fashion. One of the advantages of organizing and perceiving musical events metrically is that it enables ‘the integration of subjectively different kinds of time’ (London 2004, p. 33) within a single attentional framework, thereby allowing highly refined temporal manipulations and concomitant expressive effects.

Metrically-structured music is perceived by integrating different periodic components within a single attentional framework (London, 2004), as described by Jones’ DAT model. For example, a 3/4 metre consists of at least two levels of periodicity, one at a quarter-note level and one at a measure (or three quarter-note) level. According to this model, the first beat of each measure becomes metrically
accented due to the combination of two attentional oscillators coinciding. As London explains, ‘a metrical accent occurs when the metrically entrained listener projects a sense of both temporal location and relatively greater salience onto a musical event’ (2004, p. 23). To illustrate this, Large and Jones’ attentional graph (Figure 1 above) can be expanded by including several levels of metrical hierarchy and their combined effect (see Figure 2).

![Figure 2](image)

**Figure 2.** Attentional framework for 3/4 metre, represented with the first beat of the measure in the centre. (Large & Palmer, 2002, p. 12).

The social significance of joint metrical attending cannot be overstated. First of all, it allows people to share perceptions and expectations with great consistency and accuracy. Sharing such a precise attentional framework provides a perceptual common ground which is key in enabling elaborate forms of joint action (Knoblich & Sebanz, 2008; Keller, 2008), while engaging in coordinated patterns of action and perception can naturally lead to feelings of social cohesion (McNeill, 1995; Overy & Molnar-Szakacs, 2009).
Moreover, joint metrical attending can allow people to anticipate both what and when something is going to happen with a higher degree of certainty than most other forms of social interaction. Thus, as Overy and Molnar-Szakacs (2009) explain, metrical attending contributes to a social environment characterized by what they refer to as ‘minimized prediction error’. Interestingly, this might not only play a key role in enabling precisely coordinated joint action, but also in eliciting musical affect. Although musical emotion is often considered to arise from unexpected events (Juslin, 2001), Overy and Molnar-Szakacs have argued that having strong expectations for when something is going to happen is likely to cause a heightened emotional response when such expectations are denied. According to this view, ‘the capacity for music to create such a strong environment for minimized prediction error... provides the very basis for a strong emotional response to an unpredicted event’ (2009, p. 494).

Lastly, before moving on to the next section it is worth pointing out that even the most precise and predetermined form of musical coordination is to some extent flexible. One the one hand, there is always an inevitable degree of human error in physical entrainment; we are simply incapable of absolutely precise physical synchronization. On the other hand, and more interestingly, musical expressivity seems to lie precisely in the nuanced deviations from absolute synchrony (see Rasch, 1988; Keil 1994; Iyer, 2002). As Charles Keil famously wrote, ‘the power of music lies in its participatory discrepancies’, and in order for music ‘to be personally involving and socially valuable,’ it ‘must be “out of time” and “out of tune”’ (1994, p. 96). By thriving in participatory discrepancies, music mediates between individuality and
communality, making participants feel as an integral part of the social group which is both sustained and enriched by each member’s uniquely personal contribution. Musical participation is, in other words, marked by the creative and enticing tension between individuality and collectivity. As we shall see in the following two sections, this is an important factor to bear in mind as we attempt to describe the social experiences that arise from joint music making.

In sum, one of the most important facets that distinguishes music from most other forms of human behaviour is its highly periodic nature. This allows numerous people to participate in the same activity at the same time, and in doing so, promotes feelings of social unity and cooperation (McNeil, 1995; Hove & Risen, 2009; Kirschner & Tomasello, 2009). The capacity for joint metrical attending (Jones, 1976; London, 2004) enables participants to anticipate the temporal location of future events and thereby achieve precise musical coordination. At the same time, music’s emotional expression may rely, on the one hand, on the emotional impact that unexpected events may have within a highly predictable environment (Overy & Molnar-Szakacs, 2009), and on the other hand, on participants’ micro-temporal deviations from perfect synchrony (Keil, 1994; Iyer, 2002).

1.3.3 Joint Action and Social Experience in Ensemble Performance

The discussion on entrainment and metrical attending has brought us closer to a participatory (i.e. performative) account of how musicking may generate feelings of togetherness. In addition, these theories also provide a partial explanation of how
ensemble performers coordinate their musical actions, and how this process in turn can promote strong experiences of social cohesion, affiliation, and cooperation. However, playing music in an ensemble clearly requires more complex processes of social coordination than simply synchronizing to a shared metric framework. By extension, there are also many more layers to the kinds of social experiences that can be generated through musical interaction besides these rather simple - though unarguably powerful - feelings of social unity.

This is particularly true for sitar and tabla performance, which is characterized by overt and highly complex forms of improvised musical interaction. In order to carry out these interactions and maintain musical cohesion, performers must be able to quickly anticipate, interpret, and react to each other’s spontaneous musical behaviour. How do they achieve this? Although part of the answer to this question involves understanding the specific melodic, rhythmic, and formal concepts which characterize this style (explained in detail in Chapter Three), these interactions are also supported by more general processes of social cognition which tend to underlie most kinds of ensemble performance, and in fact many other kinds of joint human action as well.

So, what kind of cognitive processes are required for precise musical interaction, and how do these processes shape performers’ social experiences? These questions have only recently begun to be systematically addressed by musicological researchers. As Schiavio (2014) points out, music psychologists have predominantly chosen to investigate the behavioural and neurological mechanisms underlying solo and – less
frequently - joint musical action (for example, Davidson & Good, 2002; Keller, 2008), while largely avoiding their phenomenological implications. This problem is further aggravated by a bias in music psychology towards notated Western classical music and what Moran (2014) describes as the ‘individual-and-work-encounter’, which not only represents a narrow and inadequate view of human musicality, but in addition may be greatly responsible for researchers’ tendency to neglect music’s emergent social qualities.

Having said so, there are a number of scholars who have called for a more enactive, phenomenologically-nuanced, and socially-driven perspective on joint music making (for instance, Seddon, 2005; Doffman, 2012; Clayton et al., 2013; Moran, 2014; McCaleb, 2014; Schiavio & Hoffding, 2015), and who have consequently begun to provide increasingly effective models and methods by which to explore the relationship between musical interaction and social experience in an objective manner. Most of these works are framed in an interdisciplinary manner, combining concepts and empirical techniques from music psychology with qualitative practices and a sensitivity towards social ecology from ethnomusicology. In doing so, these researchers have been able to collect and compare large quantities of quantitative and qualitative data pertaining to the musical actions, cognitive processes, and social experiences involved in ensemble performance, thereby offering useful methods and conceptual frameworks by which to explore the question of musical connectivity in sitar and tabla performance.
One of the most compelling works to emerge from this line of research is Murphy McCaleb’s book *Embodied Knowledge in Ensemble Performance* (2014). In this book, McCaleb draws from current theories in cognitive psychology, collaborative research with the Boult String Quartet, and reflective practice on his own personal experience as a trombone player for The Supergroup, in order to develop an embodied model of musical interaction offering valuable phenomenological insight.

He begins his investigation by focusing on solo performance, arguing that what defines a musical action is its underlying *intentionality*. The term intentionality refers in this context to goal-oriented action, or according to the more elaborate definition by Tomasello and colleagues, ‘a plan of action an organism chooses and commits itself to in pursuit of a goal’ (2005, p. 676). While, as McCaleb notes, musicians may have a wide range of musical and non-musical intentions while performing (such as gaining the audience’s appraisal and securing future work), his use of the term – as well as my use throughout the remainder of this dissertation - is confined exclusively to the execution of sonic effects, determined by musical variables such as pitch, rhythm, tempo, dynamics, intonation, and phrasing. The first phenomenological implication to arise from this model is therefore that musical actions are predominantly intended by performers in order to achieve certain sonic goals, thus bestowing performers with a sense of agency.

Next, he considers how ensemble performers align their intentional behaviour in order to achieve musical cohesion. Based on current theories in cognitive psychology (Tomasello et al., 2005; Pettit & Schweikard, 2006; Knoblich & Sebanz, 2008), he
argues that what defines joint musical action is its shared – or ‘we’ – intentionality. As Pettit and Scheikard explain, joint action requires that ‘each of us in the plurality [the ensemble] intends that we together enact the relevant performance’ (2006, p. 21). This is why, for example, buskers who happen to be sounding together due to physical proximity cannot be said to be engaging in joint musical action, even though their combined actions have a shared effect, which is to make the public space they are performing in more sonorous. In contrast, ensemble performers share common interests, including a ‘unified concept of the ideal sound’ (Keller, 2008, p. 205) which is derived from each performer’s ‘intentions and expectations about how his or her own sound and the overall ensemble sound should be shaped dynamically over time’ (idem, p. 207).

In other words, ensemble performers must share more or less accurate representations of how their combined actions should sound in order to achieve musical cohesion. These shared representations may be derived from, and may rely upon, a wide range of sources - such as notated scores, commonly-known songs, previous rehearsals, generic improvisational frameworks, etcetera. Moreover, since performers may often have different roles in achieving their shared goal, this means that ‘the goals and intentions of each interactant must include as content something of the goals and intentions of the other’ (Tomasello et al., 2005, p. 680). Put differently, these shared representations must inform the performer not only on his or her own musical actions, but also that of his/her co-performers.

Collaborative activities [i.e. ensemble performance] require both an alignment of self and other in order to form the shared goal, and also a
The rather paradoxical aspect of shared intentionality is therefore that, while on the one hand it enables cooperation and thereby fosters social unity, on the other hand it requires that each participant’s role and intentions be kept to some extent distinct. In the case of sitar and tabla performance, musicians may come to experience strong feelings of togetherness as a result of the shared musical activity. However, in order for their performance to remain cohesive, they need to maintain a certain level of awareness of their distinct roles and intentions as melodist and rhythmic accompanist. Consequently, another phenomenological implication of this model is that musically-induced social experiences are likely to be characterized both by feelings of unity and of separateness between ensemble performers. The extent to which their experiences may lean towards either side of this spectrum may depend, in part, on the extent to which performers share similar roles and intentions (see section 1.4).

Furthermore, given the dynamic nature of musical performance, it is not enough for performers to agree on shared goals and action plans and then simply carry these intentions out according to plan. Since not every single event can be planned in advance – particularly so for improvised genres such as sitar and tabla performance, where spontaneity and unpredictability are desired qualities – performers must continuously monitor, interpret, and adapt to each other’s musical actions in order to remain cohesive. According to McCaleb, this process relies both on the embodied nature of musical performance and our inherent capacity to construe other people’s
underlying intentions when carrying out any given action. For example, when we observe someone throwing a ball, we immediately infer the underlying intention behind the various ancillary actions involved in throwing (Tomasello et al., 2005); a process which is likely supported by the activations of mirror neurons (Gallese, 2003) discussed in section 1.3.1. Likewise, when a performer observes and/or listens to a co-performer carry out a certain musical action, he or she will inevitably interpret the possible intentions behind this action - whether it is increasing tempo, changing keys, and so forth – and react accordingly.

As a result, ensemble performers are both able and required to continuously transmit, infer, and attune to each other’s evolving musical intentions, a process which McCaleb terms ‘inter-reaction’. Although this process may occasionally rely on explicit verbal and/or gestural communication, this is by no means necessary, as performers are often capable of understanding each other’s intentions simply by reference to their musical sounds and actions (see Schober & Spiro, 2013; Schiavio & Høffding, 2015). The phenomenological implication of this aspect of McCaleb’s model is that ensemble performers must be – to some extent – reflectively aware of their co-performers’ musical intentions throughout a performance. This may nevertheless vary significantly according to the kinds of musical interactions taking place, as some kind of musical interactions may require higher levels of reflective understanding than others. In other words, performers’ awareness of self and other as distinct intentional agents may vary according to the extent to which they consciously reflect on their distinct musical intentions (McGuiness & Overy, 2011). As I shall explain in
the following section, this too may have significant consequences for ensemble
performers’ social experiences.

One further interesting facet of McCaleb’s model of musical interaction is that it
highlights and helps to account for the emergent and distributed aspect of musical
creativity (Doffman, 2012; Clarke, Doffman, & Lim, 2013). As his model of ‘inter-
reaction’ emphasises, no single performer is entirely in charge of directing the course
of a musical performance, which rather emerges from the dynamic and somewhat
unpredictable interactions among performers. This means that in order to have a
better understanding of how musicians interact, and how these interactions bring
forth various kinds of social experiences, scholars must find ways of grasping and
explaining how the overall sound of an ensemble performance emerges from these
non-centrally-directed interactions. In other words, musical interaction needs to be
addressed from a perspective of mutuality (Marsh, Richardson, Baron, & Schmidt,
2006), in which every performer’s actions are analysed in relation to his or her co-
performer’s concurrent actions. Only then can we begin to explore the relation
between these emergent musical interactions and the equally emergent social
experiences that permeate them, an idea I elaborate in more detail in Chapters Two
and Four.

To summarize, questions regarding how ensemble performers interact, and how
these interactions shape social experience, have only recently begun to be explored
in a consistent and systematic manner (Moran, 2014; Schiavio, 2014). Researchers
exploring this topic have normally done so in an interdisciplinary manner, combining
methods and concepts from ethnomusicology and music psychology (for instance, Clayton, et al., 2013) in order to collect and compare both qualitative and quantitative data pertaining to the musical actions, cognitive processes, and social experiences involved in ensemble performance. Following the methodological approach, McCaleb (2014) has developed a model of ‘inter-reaction’ based on the concept of intentionality (i.e. goal-oriented action), which posits musical interaction as a continuous process of intentional transmission, inference, and attunement, underlined by shared goals and representations (i.e. shared intentionality). This model both highlights and helps to account for music’s emergent and distributed properties, which in turn calls for relational methods of musical analysis. In addition, this model offers a conceptual framework by which to relate specific kinds of musical actions with specific kinds of social experiences, and will thus be relevant throughout the remainder of this dissertation.

1.4 Towards a Model of Musical Connectivity (Part One)

The previous discussion concludes that musically-induced feelings of sociality may be brought forth by numerous factors, such as emotionally-charged bodily resonance, temporal synchronization, and intentional attunement; that social experiences permeating ensemble performance may involve varying levels of shared intentionality and understanding; and that therefore, playing music with others may result in different levels of awareness of self and other as distinct intentional agents. This means that, in order to explore the relation between musical interaction and
social experience, we need a term - and more importantly, a conceptual framework - capable of encompassing these diverse experiences.

The musicological literature offers an abundance of terms by which to describe musical sociality, such as empathy, intersubjectivity, emotional contagion, communication, attunement, rapport, combined flow, and many more. After much consideration - and after momentarily adopting the terms empathy and intersubjectivity, both of which are prominent in the musicological literature (see Seddon, 2005; McGuiness & Overy, 2011; Rabinowich, Cross, & Burnard, 2012; Cross, Lawrence, & Rabinowich, 2012; King & Waddington, 2017) - I have chosen to refer to the enactment of positive feelings of sociality through joint music making as musical connectivity, primarily for reasons of simplicity and inclusivity, as explained below. In contrast, situations which do not bring forth any positive social feeling, or perhaps even bring forth negative ones, are referred to as exhibiting a lack of connectivity or disconnection.

As stated, the rationale for my use of the term musical connectivity involve the term’s simplicity and inclusiveness, which offer an advantage in the particular scenarios of fieldwork and qualitative data collection that this project entails. Both empathy and intersubjectivity have very specific and rather complex meanings, which I shall explain shortly. One basic problem of using these terms is that they would have constituted a barrier in communicating with some Indian musicians. Moreover, while high specificity of meaning offers an advantage, in that it allows one to refer to precise facets of human experience, it may also pose a disadvantage by potentially
excluding other aspects of experience which do not fall within its narrow sphere. In contrast, the word connectivity is used colloquially and is familiar to musicians and musicologists, and therefore easily grasped and intuitively related to a broad range of musical experiences, regardless of genre or context.

By referring to the various positive social experiences that may arise from joint music making with a broad, non-specific term such as musical connectivity, I intend to allow the precise meaning and content of this term (as it applies to North Indian music) to emerge from the research itself, rather than being imposed and therefore narrowed from the start. Put differently, rather than assuming that Indian musicians experience either empathy or intersubjectivity while performing, I have adopted a term capable of referring to any kind of positive social feeling, in order to then establish the precise nature of these feelings - and their relation to musical interaction - by means of research.

In order to clarify this point, let us consider the meaning of the terms empathy and intersubjectivity in more detail. According to McGuiness and Overy (2011), intersubjectivity is characterized by conscious understanding of the other’s intentions as separate from one’s own, and thus by reflective awareness of self and other as distinct intentional agents. Similarly, empathy refers to the process of putting oneself in the other person’s place and momentarily feeling what the other person is feeling at the time. As Felicity Laurence explains, ‘the feeling we have in response to another’s empathically perceived experience is our own primordial experience, but the perceived experience of feeling of the other is not our own
feeling’ (2013 p. 6). This means that in empathetic situations one is both consciously aware of the other person’s feelings and of the fact that those feelings are not one’s own. In short, both empathy and intersubjectivity consist of reflective and rather detached forms of social experience, involving a clear awareness of the other person as a separate being.

Although musicologists have often relied on these terms to describe musically-induced feelings of sociality (see Seddon, 2005; Keller 2008; Cross et al, 2012; King & Waddington 2017), various scholars have recently noted that some of the most fundamental forms of musical interaction involve little or no reflective understanding of the other person’s intentional agency and emotional disposition (McGuiness & Overy, 2011; Schober & Spiro, 2013; Schiavio & Høffding, 2015), and that therefore, pre-reflective forms of interaction should also be taken into account. For instance, Schiavio and Høffding argue that while ‘conceptual, reflective knowledge can be important... it is neither necessary nor sufficient’ (2015, p.2) as an account of the behaviours and experiences underlying ensemble performance, and that theories which focus almost exclusively on reflective knowledge ‘might downplay the embodied and ecological embedded process that allow music performance, coordination, and understanding’ (idem).

As an example of pre-reflective musical interaction, let us consider metrical entrainment, which as we have already seen, is generally considered to be one of the main factors in promoting a sense of social cohesion through joint music making (Overy & Molnar-Szakacs, 2009, see section 1.3.2). Although the initial stages of
attentional entrainment among ensemble performers may require some reflection regarding pulse and metre (in other words, it requires performers ‘figuring out’ what the pulse and metre is, a task which may occasionally be rather challenging), once the right framework has been identified there is no need for performers to reflect on each other’s intentions at this level (unless there is a conscious intention to change metres, or either increase or decrease tempo in a manner that is perceptually-salient). Similarly, we have also seen that music may generate shared affective states through processes of motor resonance and emotional contagion (idem), which are likewise characterized by lack of reflective awareness of the other’s intentions and mental/emotional states. Thus, Schiavio and Høffding maintain that:

If we wish to understand experience, we have to examine more than reflective thinking, more than representation, attention, plans, and goals. The pre-reflective basis of thinking and planning must be accounted for, the inherently embodied nature of musicianship must be grasped, as must the inherently interactive nature of playing together. (2015, p.5)

As these authors point out, the distinction between reflective and pre-reflective forms of musical interaction has important implications for performers’ concomitant social experiences. In short, interactions that involve reflection of the other person’s intentions bring forth experiences that are characterized by an awareness of the other person as a distinct intentional agent. These kinds of interactions allow for the sharing of precise information and are therefore communicative in nature. Conversely, interactions that do not involve reflective understanding of the other person’s intentions bring forth more communal experiences characterized by a reduced awareness of the other as a separate agent, and consequently, a merging sense of self and other.
Whereas reflective forms of social interaction bring forth states of *intersubjectivity*, both De Nora (2000), and McGuiness and Overy (2011), have argued that non-reflective forms of interaction may bring forth an entirely different, although arguably more potent state of shared subjectivity, referred to by these authors as *co-subjectivity*. As McGuiness and Overy explain,

> Co-subjectivity differs from intersubjectivity and communication by virtue of the absence of reflective identification of the other’s agency and intention by both the sender and receiver of the communication. (2011, p. 257)

In other words, the difference between intersubjectivity and co-subjectivity is that the first involves reflective understanding of the other person’s agency and intentions as separate from one’s own, whereas the second does not. In order for ensemble performers to experience states of intersubjectivity their interactions require, firstly, performer A being reflectively aware of performer B’s musical intentions, and secondly, performer B knowing that performer A understands his intentions. In contrast, co-subjective interactions do not involve this kind of recursive intentional understanding, relying rather on pre-reflective perceptual, bodily, and affective responses to environmental cues, enacted through processes such as entrainment and emotional contagion.

Given the fundamental role that pre-reflective processes of social cognition play in allowing for musical coordination, terms and models that imply high levels of reflective understanding - such as empathy and intersubjectivity - are inadequate to describe the full range of positive social feelings that can be generated through joint music making. At the same time, I would argue that focusing exclusively on pre-
reflective processes such as entrainment and emotional contagion would likewise risk neglecting some important aspect of sitar and tabla performers’ social experiences that may be brought forth through higher levels of reflective understanding. Thus, one of the main arguments I put forth in this dissertation is that musically-induced states of shared subjectivity can be both reflective and pre-reflective, mental and physical, communicative and communal, and that one must therefore adopt a model which allows for, and distinguishes between, both kinds of states.

Based on the work of philosopher Daniel Dennett (1991), Eric Clarke has argued that musical consciousness may consist of multiple streams, acting ‘in constant and overlapping parallelism, with different streams of this parallel processing reaching consciousness at different times’ (2011, p. 207). Following this line of thought, the model of musical connectivity I hereby propose posits ensemble performers’ social experiences as consisting of both a co-subjective and an intersubjective stream. While both of these streams may operate in parallel, either one may become momentarily more prominent and intensified – and therefore have a stronger effect on performers’ social experiences – according to the musical interactions currently taking place. Thus, by identifying the level of reflective awareness involved in various kinds of musical interaction, one can then investigate what kind of social experience is more prominent and/or valued in any given genre.
Towards a Model of Musical Connectivity (Part Two)

In order to further integrate these two states of shared subjectivity within a single conceptual model, and moreover, in order to use this model to gain greater phenomenological insight regarding the social experiences underlying ensemble performance, I now propose that these two streams of musical consciousness and concomitant social experience correspond with what Antonio Damasio (1999) has identified – based on both neurological and biological evidence - as core and extended forms of human consciousness. Moreover, since – as Damasio notes – human consciousness is always necessarily accompanied by a sense of self, the distinction between these two levels of consciousness imply to distinct levels of selfhood, which he refers to as core and autobiographical self.

Damasio summarizes the difference between core and extended consciousness in the following manner:

‘The scope of core consciousness is the here and now... There is no elsewhere, there is no before, there is no after. On the other hand, the complex kind of consciousness, which I call extended consciousness and of which there are many levels and grades, provides the organism with an elaborate sense of self – an identity and a person, you or me, no less – and places that person at a point in individual historical time, richly aware of the lived past and of the anticipated future, and keenly cognizant of the world beside it’. (Damasio, 1999, p. 16)

According to Damasio’s theory, consciousness is physically rooted in an organism’s moment-by-moment proprioceptive monitoring of its internal bodily stasis, such as heart rate, respiration, and the functioning of visceral systems. The organism’s homeostasis provides a relatively stable reference point which Damasio terms the ‘proto-self’, and which in turn provides the biological foundation on which both
consciousness and selfhood are sustained. However, there is no perception of the external world and therefore no consciousness at the level of the proto-self.

Core consciousness, in Damasio’s account, emerges from the felt relationship between an organism’s perceptual awareness of the external world and of the effect that external perception has on its internal homeostasis. Through this juxtaposition, an organism becomes aware that its internal bodily states that constitute its proto-self are affected by what it perceives in its surrounding environment, and hence, gains awareness of the difference between self and non-self. Core consciousness is pre-reflective, non-verbal, and relies exclusively on short-term memory. It is constituted by an organism’s current perceptual awareness of, and feeling towards, its relationship to the external world during each present moment. The sense of self that underlies core consciousness is therefore transient, or pulse-like, confined to brief time spans no longer that the ‘psychological present’, and inextricably tied to bodily sensation, feeling, and emotion.

In contrast, extended consciousness operates on the basis of long-term memory. It encompasses distant past and future events, it is reflective, and based largely on language. Extended consciousness is most characteristically human, as it enables abstract thought and complex planning, as well as the emergence of shared intentionality, which we have noted to be crucial for all kinds of social cooperation (Tomasello et al., 2005), including ensemble performance (McCaleb, 2014). In addition, one of the clearest manifestations of extended consciousness is the ongoing internal monologue which goes on in our heads almost at all times, and which is key
in allowing us to construct narratives out of past memories and future expectations, develop concepts of personal and social identity, and thereby give rise to what Damasio refers to an *autobiographical self*. And yet, while extended consciousness is in some respects the pinnacle of human consciousness, it cannot exist without the indispensable foundation of core consciousness and the proto-self.

Although these two types of consciousness are understood as constituting two parts of an indivisible whole, Damasio’s theory also implies that some experiences – or aspects of experience – are processed primarily at only one of these two levels. In short, events that are brief and pre-reflective are grasped at a core level of consciousness, whereas experiences that last long and involve reflection are likely to rely upon extended levels of consciousness. This means that musical actions which are spontaneous, largely confined to the psychological present, and then quickly forgotten, may be assumed to have a stronger influence on a performer’s core self over his or her extended sense of self. Conversely, musical actions that need to be carried out according to a pre-conceived plan, which involve reflective awareness, and which extend beyond the confines of the psychological present, are most likely to depend upon, and have an effect on, a person’s extended level of consciousness and selfhood.

Furthermore, given that these two types of consciousness are primarily distinguished by their time scope and level of reflection, I propose that pre-reflective, co-subjective forms of musical interaction are experienced primarily at a core level of consciousness, whereas reflective, intersubjective forms of interaction are
experienced at an extended level. In other words, since reflective awareness operates primarily at an extended level of consciousness, this means that intersubjective interactions will be experienced at this level, whereas co-subjective forms of musical interaction will affect performers’ sense of self and other at a core level of consciousness.

Damasio’s theory of consciousness provides a biological and neurological model by which to ascertain the existence of two levels of musically-induced social experience operating in parallel, and varying in intensity according to the quality (based on the variables of duration and reflection) of the performers’ interactions, as proposed in section 1.4. His distinction between core and extended (or autobiographical) levels of selfhood may also allow us to gain further phenomenological insight regarding how musicking affects performers’ sense of self and other in various ways (see Chapter Six). In addition, since Damasio’s theory relates specific brain areas with either core or extended levels of consciousness, this may potentially allow us to make predictions regarding brain activity in relation to varying kinds of musical behaviour and social experience (a task which however lies beyond the scope of this research).

In sum, the model of musical connectivity I propose distinguishes between two levels of musical consciousness (i.e. core and extended consciousness), and two related states of shared subjectivity (i.e. co-subjectivity and intersubjectivity). I argue that these two levels of musical experience can – to some extent – be distinguished from one another and be associated with certain kinds of musical interactions. This distinction is based primarily on two variables; namely, duration and reflection.
Aspects of musical interaction that exceed the confines of the psychological present and that involve reflective thinking are likely to bring forth extended, intersubjective forms of both personal and social experience. In contrast, aspects of musical interaction that are brief, unplanned, and pre-reflective are responsible in shaping core, co-subjective facets of musical experience. Thus, by understanding how performers interact, and by identifying the levels of reflective thinking involved in these various interactions, one can describe the kinds of social experiences that are likely to underlie performance in any given genre. Throughout the remainder of this dissertation, I apply this model in the context of live sitar and tabla duo performance.

1.6 Research Aims, Methodology, and Chapter Outline

To recapitulate, this research explores the shared human capacity for enacting positive social experiences through joint music making as it pertains to ensemble performance in a non-Western, improvisational, and - as Turino (2008) puts it - presentational, genre. This question is addressed from a behavioural, phenomenological, and ecological perspective, in that the goal of this research is to gain a detailed understanding of the kinds of social experiences that tend to characterize sitar and tabla performance, and how these experiences are both embedded in a shared socio-cultural environment and generated by musical interactions among performers. Moreover, while focusing on one specific genre, I nevertheless expect to contribute concepts, methods, and both empirical and ethnographic data which will help us understand the relation between musical interaction and social experience across a wider range of musical scenarios.
Musical connectivity is addressed throughout this dissertation as a quality of first-person experience or inner life which emerges from a performer’s affective, cognitive, and sensorimotor interactions with his or her physical, social, and cultural environment. Social experiences are conceptualized in term of co-subjective and intersubjective states of shared subjectivity, which are distinguished according to the level of reflective awareness of self and other as separate intentional agents, and which correspond with what Damasio (1999) refers to as core and extended levels of consciousness. The goal for the remainder of this dissertation is to uncover the prominence and/or preference of each of these musically-induced states of shared subjectivity among sitar and tabla performers, and the means by which these ideal social experiences are brought forth in the course of live performance.

Based on this model of musical connectivity, I explore how sitar and tabla performers bring forth positive social experiences by considering the following questions: What levels of reflective intentional awareness tend to characterize sitar and tabla duo performance, and what level of reflective intentional awareness constitutes the ideal social experience for performers in this genre? In other words, do Indian performers prefer to connect at a co-subjective or an intersubjective level? How do performers manage to achieve, or bring forth, this desired level of reflective awareness by means of musical interaction? And how do other contextual factors – i.e. social relationships, audience, venue, pedagogy, etc. – impinge, either positively or negatively, on the performers’ capacity to achieve their ideal social experience? Whilst exploring these various issues, I also address the broader question – stated at the start of this chapter
regarding the possibility of uncovering empirical relations between ensemble performers’ musical interactions and their self-reported social experiences.

In Chapter Two, I discuss the various conceptual and methodological challenges involved in working in an interdisciplinary manner and in making subjective experience into the focus of academic research. I refer to the work of other scholars who have had to confront similar problems, and offer solutions based on a variety of ethnographic and empirical methods of data collection and analysis, combined with my own reflective practice as a sitar student. I provide an outline of my methodological development throughout this research, and discuss the role of fieldwork, ‘bi-musicality’ (Hood, 1960), and of working in close collaboration with expert informants. I also explain why research on musical connectivity should aim to analyse musical interaction at a relational, and therefore truly social, level. Lastly, I point out some implicit assumptions and values regarding North Indian musical authority which characterize, and may potentially impair, unbiased ethnomusicological research.

In Chapters Three and Four, I begin to address the question of musical connectivity from a behavioural perspective - that is, by describing the various kinds of musical interactions which permeate sitar and tabla performance - thereby providing a foundation on which to subsequently investigate this topic from a phenomenological perspective. In Chapter Three, I explain basic Indian music concepts such as rāg, tāl, tihāi, lay, and so forth, and describe each performer’s role in enacting these musical concepts throughout a performance. I then argue that this level of description –
which is characteristic of most literature on North Indian music – ignores fundamental aspects of social interaction in ensemble performance, and is therefore inadequate for research on musical connectivity. In order to overcome this problem, Chapter Four presents a ‘relational’ (Marsh et al., 2006) analysis of the vilambit section of live commercial recording by Pt. Nikhil Banerjee and Zamir Ahmed Khan (1972), through which I test various methods of grasping performers’ musical interactions at a formal, rhythmic, and micro-temporal level.

Chapter Five presents and discusses qualitative and quantitative data collected through a collaborative case study with expert informants Shyam Rastogi and Sandeep Rao, carried out in the North Indian city of Varanasi. The aim of this chapter is to explore the relationship between performers’ contextualized musical interactions with their self-reported feelings of sociality, and thereby uncover the kinds of musical interactions by which sitar and tabla performers connect, whilst also taking into account the social environment within which these interactions are embedded. In order to do so, I apply the relational methods of musical analysis developed in Chapter Four, combined with ethnographic data collected through interviews.

In Chapter Six I carry out a phenomenological analysis of musical connectivity in sitar and tabla performance. I begin by drawing several conclusions regarding the level of reflective awareness involved in sitar and tabla performance based on the analyses presented throughout Chapters Three, Four, and Five. I also discuss these performers’ reported preference for certain kinds of personal and social experiences,
particularly those related to matters of Indian spirituality (Clarke & Kini, 2011), and consider ways in which these idealized experiences are brought forth in the course of performance. Lastly, based on performers’ reports that music may have a profound, transformative effect on performers’ sense of self and other, I attempt to account for this possibility from an embodied and enactive perspective (Varela et al., 1991), and by drawing further from Damasio’s (1999) biological theory of consciousness.

Chapter Seven brings this dissertation to a close by summarizing its findings, evaluating its contribution to current musicological research, and proposing possible improvements and potential routes for further investigation.

In sum, I begin by analysing and describing the musical interactions which constitute a typical sitar and tabla performance (Chapters Three and Four); I then investigate the relationship between contextualized musical interactions and performers’ self-reported feelings of sociality (Chapter Five); and lastly, I offer a phenomenological analysis of what it might feel like to connect with one’s co-performer in this particular genre (Chapter Six). All of these lines of research are complemented both by considerations of social ecology gained through fieldwork and by my own reflective practice as a sitar student (Chapter Two).
Chapter Two – Methodological Considerations

2.1 Aims and Challenges

As explained in the opening chapter, the aim of this research is to investigate the relationship between musical interaction and social experience in live sitar and tabla duo performance, in order to find out how positive feelings of sociality are enacted in this particular genre, and what it feels like to connect with one’s duo partner in this context. One of the central concerns throughout the early stages of my research was developing an appropriate methodology by which to tackle this rather elusive topic. I approached this question in an interdisciplinary manner involving three broad steps:

1. Explore the musical interactions that constitute sitar and tabla performance from a socially-driven, i.e. relational perspective;

2. Investigate the relationship between performers’ musical interactions and their self-reported social experiences in contexts of ecological validity;

3. Apply the model of musical connectivity developed in Chapter One to postulate further relations between certain kinds of musical interactions and underlying states of shared subjectivity.

In this chapter, I provide a more detailed consideration of the various methodological issues emerging from this research. I begin by situating this dissertation in an interdisciplinary context, combining methodologies and concepts from ethnomusicology and music psychology. I then discuss some important matters regarding fieldwork, instrument learning, and reflective practice, followed by a
description of the different methods of data collection and analysis I eventually applied, the reasons for doing so, and an outline of the process by which I arrived at this methodological approach. Lastly, I discuss some questions regarding musical capacity and authority which emerged from my experience as a sitar student and fieldworker.

But firstly, it is worth considering the various methodological challenges involved in making joint musical action, social experience, and their relationship the focus of academic research. The first set of challenges pertains to developing analytical methods by which to capture musical interactions among sitar and tabla performers in an accurate and insightful manner. One reason why this is problematic stems from this music’s oral and improvisational nature, meaning there is no written score upon which to base an analysis. Although one option is to transcribe certain portions of a performance – a process which is in itself both challenging and time-consuming – this process poses additional questions, such as deciding what to include or exclude from the transcription, and how to represent certain melodic and rhythmic actions which are alien to Western classical music and staff notation.

Furthermore, in order to uncover recurring patterns in the relation between musical interaction and underlying social experience, one must ideally be able to collect and compare large quantities of data, which means either complementing or replacing traditional, score-based methods of musical analysis with more empirically-driven approaches derived from music psychology. It is also important that these empirical methods are designed to capture musical interaction at a relational (Marsh et al.,
and therefore truly social level, since as Moran points out, ‘it is unlikely that the empirical approaches which are implicitly biased towards an individual conception of music-making will be able to explain well the sort of direct, non-linguistic, co-constructed meaning which – it is argued – is emergent from the interactional behaviour of musicking people’ (2014, p. 6). In other words, it is not enough to describe each performer’s concurrent actions separately, as is often the case. Rather, one must try to uncover how each performer’s actions affect his or her co-performer’s actions, and how performances emerge in a non-centrally directed manner from this dynamic process (for example, see Doffman, 2012).

Another set of challenges results from trying to study musicians’ subjective experiences, which - being personal, internal, and non-replicable - are hard to access and measure both objectively and comparatively. Although one can interview performers on this issue, they may nevertheless struggle to describe their musical experiences or identify the reasons that might have caused them. This is particularly true considering that, as we have seen in Chapter One, conscious experience is shaped in many ways by non-conscious processes which are therefore inaccessible to personal reflection. Moreover, informants can only describe an experience upon recollection. This is problematic not only because memory may be an unreliable source, but also because it turns experience from process to product, thereby robbing it of its defining temporal dimension. In short, one must find effective ways of accessing and tracing the dynamic unfolding of the performers’ musical experience throughout the course of performance.
The third set of problems relate to the personal and rather sensitive nature of the topic itself, in that performers may understandably feel displeased or frustrated when ideal states of musical connectivity are not achieved, especially when they are being carefully observed by a researcher. Ethnomusicologists have long become aware of how their involvement may alter their informants’ normal musical behaviour, and may thereby have a significant effect on the data collected (see Nettl, 2005; Barz & Cooley, 2008). This may be particularly true with a phenomenon as elusive as musical connectivity, which can easily be inhibited by a researcher’s presence. Furthermore, the topic of musical connectivity hinges both on questions of musical capacity and social relationships, meaning it must be dealt with in a delicate manner. This is particularly true working with people from an entirely different culture, with different cultural norms regarding how to address potentially conflictive topics such as this. As I shall explain later on, while I strived to be as unobtrusive and non-judgemental as possible – a stance which in turn caused some minor methodological inconveniences, described in section 2.6 - I am nevertheless aware that my research and mere presence did affect the performers’ behaviour and musical experience.

2.2 A Question of Interdisciplinarity

There is a significant precedent of scholars exploring similar questions – and therefore confronting similar challenges – who have successfully addressed these issues by combining cognitive/communicative models and empirical approaches
from psychology with ethnomusicological fieldwork and an awareness of music’ inherent social embeddedness (for example, Seddon, 2005; Clayton, 2005, 2007b; Doffman, 2012, 2013; Moran, 2013b; McCaleb, 2014; Schiavio & Høffding, 2015). As McCaleb succinctly puts it, ‘rather than conducting research on musicians and the way they interact with each other, a methodology that combines participatory action research, reflective practice and empirical methods would allow for research by and with musicians’ (2014, p. 15). Overall, I consider this to be the most appropriate approach for research on musical connectivity, which is why I have decided to follow their lead, while also attempting to offer some novel methods of data collection and analysis.

On the one hand, due to its focus on non-Western music, its reliance on fieldwork and ‘bi-musicality’ (Hood, 1960), and its framing of the question of musical connectivity in a manner which is both socially-sensitive and ecologically-valid, this research is firmly situated in the field of ethnomusicology. This research is based on the premise that, in order to grasp how Indian performers experience connectivity, and how this experience is tied to their contextualized musical interactions, one must have a firm understanding of: (i) the particular musical concepts pertaining to this style (i.e. rāg, tāl, and so forth, see Chapter Three); (ii) how these concepts are enacted in the course of a performance; and (iii) the social environment within which this music is both learnt and performed. Although one can learn about these issues by reading the existing ethnomusicological literature (for instance, Neuman, 1980; Bagshee, 1998; Clayton 2000; Neuman, 2012), ultimately the most effective way of becoming truly familiar with Indian music is by immersion into the musical culture as
a fieldworker, and moreover, by learning one of the instruments from an experienced guru, both of which were fundamental aspects of my research methodology (see sections 2.3 and 2.4).

On the other hand, the very nature of the research question I am proposing touches on various topics – such as joint action, social cognition, phenomenology, distributed creativity, and emergence - which are inherent to music psychology, and which therefore call for conceptual frameworks and empirical methods of data collection and analysis derived from this field. While methods of participant-observation are both necessary and insightful, uncovering recurrent patterns in the relation between musical interaction and social experience necessarily requires large quantities of rigorous data collected in experimental conditions, as well as reference to established cognitive and phenomenological frameworks by which to interpret this data.

Consequently, I hold that research on musical connectivity in sitar and tabla performance requires both an intimate understanding of this music’s aesthetics and social environment gained from ethnomusicology, combined with experimental designs, conceptual frameworks, and empirical methods of musical analysis derived from music psychology. Ultimately, these two approaches are highly complementary since, on one hand, experiments are needed in order to collect robust data and test possible hypotheses, whereas on the other hand, ethnomusicological methods of participant-observations help propose more refined hypotheses, build relationships with potential collaborators, and design experiments sensitive to the musicians’ natural social environment. By approaching the question of musical connectivity in
an interdisciplinary manner, this research can potentially provide music psychology with a non-Western, socially-sensitive, and ecologically-valid account of joint music making and its underlying phenomenology, and at the same time provide ethnomusicology with a rigorous, empirical account of how sitar and tabla performers interact, and how these contextualized interactions generate varying feelings of sociality.

Having said so, it is also important to recognize that there are some potential risks in approaching a doctoral research in an interdisciplinary manner, such as failing to offer a significant contribution or fully grasp some of the concepts, methods, or literature from either field. Yet at the same time, there is also enormous potential - even necessity - for scholars in different fields to communicate with each other, share their distinct knowledge, and be able to tackle research questions conjointly. This is particularly true for a question such as the one I am posing, which as I have argued necessarily requires concepts and methods from both fields. Therefore, while recognizing and hopefully averting the above-mentioned risks, adopting an interdisciplinary approach has encouraged me to broaden my knowledge and communicative skills as a scholar.

2.3 Defining Fieldwork

While, in its focus on the phenomenology of musical connectivity and its behavioural underpinnings, the topic of this dissertation is both contemporary and, I would hope, fairly original, it is worth noting that understanding how other people experience music has been a fundamental concern among ethnomusicologists at least since the
1960’s, and that - as Barz and Cooley (2008) point out - this discipline has continuously shifted in emphasis away from musical representations (i.e. texts) and towards musical experience throughout the ensuing decades.

During the previous century, two main ideological and methodological trends emerged by which ethnomusicologists attempted to access and learn about the musical experiences of people from other cultures. The first was an anthropological approach advocated by Alan Merriam (1964), which emerged as a revolt against earlier ‘armchair ethnomusicologists’ (Nettl, 2005) and which emphasised the importance of extensive periods of fieldwork. In contrast, Mantle Hood (1960) proposed a more musicological approach which, without denying the importance of fieldwork, emphasised the epistemological value in learning an instrument of the culture one wants to study, and thereby becoming, as he put it, ‘bi-musical’. Both of these approaches have now become common practice among ethnomusicologists, and have likewise been central to my own research.

Before I offer a specific account of my approach to fieldwork, it is important to point out that the definition of what constitutes the ‘field’, and the way in which fieldworkers interact with informants, has undergone a process of significant change over the past few decades, as a result of the enormous advances in technology, transportation, and communication. Whereas, around the time of Merriam and earlier, ethnomusicologists would ideally spend an entire year in the field - which would almost always consist of a village or pre-modern society in a non-Western country - this has changed significantly now that both researchers and informants can
travel back and forth more frequently and communicate over large distances more easily and effectively, and now that researchers can find expert informants and authentic musical performances within their own communities (Nettl, 2005).

My own work and experience as a fieldworker is a clear example of this new scenario. As I pointed out in the preface, I had already been to India several times before starting this research, and had some experience learning tabla from guru Keshava Rao Nayak. I therefore had already established some contacts and relationships with professional Indian performers, and had some familiarity with Indian music and culture from the start.

Throughout the course of my research I carried out three relatively short trips to the North Indian city of Varanasi (also known as Benares, Banāras, Kashi): a four-week trip in August 2013, a six-week trip in January/February 2014, and a three-week trip in August 2016. In addition, I have also been actively involved with the Indian music scene in Edinburgh and the UK more broadly; taking sitar lessons from both professional (Mehboob Nadeem) and semi-professional (Laurence Howells) teachers; attending concerts within my local area (most notably two concerts by the great sitar player Ustād Shahid Parvez); and both teaching and organizing events for ‘The Sitar Project’, an Edinburgh-based community music organization. I also kept regular communication with my Indian-based sitar guru Debashish Sanyal via Skype, and arranged two trips during which he visited Edinburgh in October 2015 and April 2017, during which he gave several performances, workshops, and private lessons.
Based on Barz and Cooley’s contemporary definition of fieldwork as ‘the observational and experiential portion of the ethnographic process during which the ethnomusicologist engages living individuals as a means toward learning about a given music-cultural practice’ (2008, p.4), I hold that my fieldwork was not limited by the time spent in India, but included all of my interactive experiences with people actively engaged with Indian music, both in India and in the UK, both experts and non-experts, both in person and via Skype.

Having said so, the time I spent in India was of fundamental importance to my research. During these trips I took both sitar and singing lessons from gurus Debashish Sanyal and Ashish Jaiswal on a daily basis, attended numerous performances, had formal and informal conversations on topics relating to musical connectivity with many musicians, and carried out two case studies in collaboration with local performers (see sections 2.5 and 2.6).

The reasons for carrying out three relatively short trips to India rather than one long one were partly due to personal circumstances (having a wife and dog to keep company, bills to pay, etc.) and partly due to methodological convenience. The first trip in August 2013 allowed me to establish contacts and relationships with Indian performers, to familiarize myself more thoroughly with Indian music and culture, and to carry out a pilot case study (see section 2.5). Upon returning to Edinburgh, I was able to reflect on this experience together with my supervisor and design a more elaborate and extensive case study (see section 2.6) which was implemented during my second, slightly longer visit in January/February 2014. My third trip took place in
August 2016 during the writing-up stage of my dissertation, and allowed me to discuss and reflect one last time on the various conclusions which I had arrived at throughout my research.

I should also explain why I decided to carry out most of my fieldwork in Varanasi, beginning with a description by Diana Eck which vividly captures the essence of this city, and which will hopefully help the reader visualize this rather unique place:

Banâras is a magnificent city, rising from the western bank of the River Ganges, where the river takes a broad crescent sweep toward the north. There is little in the world to compare with the splendor (sic) of Banâras, seen from the river at dawn… The temples and shrines, ashrams and pavilions that stretch along the river for over three miles are golden in the early morning… Long flights of stone steps called ghâts, reaching like roots into the river, bring thousands of worshippers down to the river to bathe at dawn. In the narrow lanes at the top of these steps moves the unceasing earthly drama of life and death, which Hindus call samsâra. But here, from the perspective of the river, there is a vision of transcendence and liberation, which Hindus call moksha. (Eck, 1983, p. 3)

Varanasi is one of the oldest continuously inhabited cities in the world, and a place of great significance to Hindus as the home of Lord Shiva, who is believed to grant immediate liberation (i.e. moksha) upon death in this city (Eck, 1983). More importantly for the topic of my research, Varanasi represents one of the six main tabla styles (i.e. gharânâs), hosts two renowned yearly music festivals (the Dhrupad Mela and the Sankat Mochan Sangeet Samaroh), is the site of Banaras Hindu University (one of the highest ranking universities in India and home to a large and vibrant music department), and the hometown of music legends such as Pt. Ravi Shankar, Pt. Krishan Maharaj, Girija Devi, and Us. Bismillah Khan.
Before moving on, I should also address another aspect of my approach to fieldwork that may be construed as a limitation, which is that I did not set out to learn Hindi, but relied rather on the English language as means of communicating with informants. The reason behind this decision is mainly that I did not consider myself capable of gaining enough fluency in the relatively short time available to be able to converse on a topic as complex and subtle as musical connectivity. Moreover, having been to India several times before, I was aware that most performers there were relatively fluent English speakers, certainly more fluent than what I could accomplish with Hindi within the given time-frame. I therefore decided that a more useful way of spending my time - and becoming intimately acquainted with Indian culture in the process - would be to dedicate myself to rigorous sitar and singing practice.

2.4 The Role of Instrument Learning and Reflective Practice

Throughout this research I have been studying sitar, and to a lesser extent singing, with my gurus Debashish Sanyal and Ashish Jaiswal, and will most likely continue to do so for many years to come. In addition, I also studied a bit of tabla with Keshava Rao Nayak prior to commencing my PhD. Not only have these various learning experiences been extremely joyful and rewarding in themselves, but I also consider the process of instrument learning to have been an integral part of my research for several reasons.

First of all, it provided me with a personal and intimate understanding of how sitar and tabla performers interact from a first-person perspective, and from both the
sitarist’s and the tabla player’s point of view. One could argue that the capacity to perform in the style or genre one is researching is in itself proof of one’s intimate understanding of the music being studied. As Stephen Slawek has argued:

"Competent performance of Hindustānī music by a Western researcher amounts to an experiential translation of a cultural experience that may potentially equal a written statement in depth of intellectual engagement and most probably will surpass a written statement in the intensity of its emotive affect." (Slawek 1994; in Wong, 2008, p. 82)

Whilst strongly agreeing with Slawek’s sentiment, there are several more pragmatic ways in which learning the sitar - and to a lesser extent vocals and tabla - contributed to me research. For one, it allowed me to develop an intimate relationship with my various teachers, all of whom I consider to be highly accomplished and knowledgeable musicians, and who became some of my closest and most reliable informants. This was particularly true regarding Debashish’s visits to Edinburgh in October 2015 and April 2017, which granted me with ample opportunities to discuss aspects of my research in detail.

In addition, learning the sitar also allowed me to reflect on my own - albeit limited - musical experience while playing with other musicians. This provided me a partial solution to one of the main methodological challenges mentioned at the opening of this chapter: namely, how to access the dynamic unfolding of a performers’ experience of sociality and its causal relation to musical interaction. While my own musical capabilities and concomitant musical experiences are admittedly rather limited in comparison to professional musicians, being able to reflect on my own feelings and actions while these were taking place offered me valuable insight be which to investigate musical connectivity in more accomplished performers.
Overall, my approach to reflective practice was essentially circular in nature: the topic of this research arose from reflecting on my own musical experience; I then familiarized myself with the literature on this topic and had discussions about it with more expert performers; I then carried out pilot case studies designed to collect qualitative and quantitative data on this topic; I analysed the data, wrote a report, and reflected on the implications of these results based on the existing literature and on my own experience. This in turn led to further reflection on my own experience while musicking, and thereby the beginning of a new cycle engaging with new literature, discussing new issues, and adjusting my methods of data collection and analysis. I should also clarify that while my reflective practice supports my research in many ways, none of the conclusions I propose in the following chapters are entirely based on my own personal experience. Rather, I use my own experience to postulate hypotheses and interpret the data pertaining to other, more capable and representative musicians’ experience of musical connectivity. Moreover, whenever I do draw on my own experience, I state this clearly to avoid confusion.

2.5 Pilot Case Studies

While useful, one can only gain limited insight on the relationship between musical interaction and social experience by means of fieldwork and reflective practice. In addition, research on this topic requires more rigorous data collected in relatively controlled experimental settings. These experiments should be designed to access performers’ personal experiences, collect varied data on their musical behaviours,
and encourage performers to reflect on the relation between the two. At the same
time, given the important role that social environment is likely to play in shaping this
causal relation and in promoting musical connectivity (Moran, 2013a; Clayton &
Leante, 2015), experiments should maintain the greatest possible ecological validity.
In this section, I describe the process by which I developed experiments following
these premises, and which led to a final case study – described in section 2.6 - through
which I eventually collected most of my data.

Before doing so, I should explain that this process was both accompanied and shaped
by a gradual shift in my research focus. Initially, my goal was to explore how music
promotes social bonding by creating an environment in which time can be
experienced socially; or in other words, how performers and listeners attend to time
in a highly coordinated way, and how this promotes social cohesion. The working title
of my thesis at this stage was ‘Musical Time as a Shared Social Experience – The Case
of North Indian Classical Music’, and my early methodological approach was
consequently directed towards exploring how performers and listeners perceive,
enact, and attend to musical time. As my research interest shifted towards the topic
of musical connectivity between performers, and musical time became a somewhat
secondary issue, my methodological approach changed accordingly. Furthermore,
this had a two-way effect, since one of the main reasons why the topic of my research
shifted was because of several conceptual and methodological challenges intrinsic to
my initial research topic and which I was unable to overcome.
My first pilot case study was based on a live performance by Edinburgh musicians Laurence Howells (sitar) and Dhanajay Modak (tabla), in which I took an active part as the tanpura player. The two most important characteristics of this case study’s methodology were that it was participative (I was one of the performers, albeit the least relevant one) and collaborative (the performers collaborated in the post-performance stages of musical analysis). This methodological approach – which would form the basis of subsequent case studies - was inspired by the work of other scholars who have explored similar performative questions in an ecological, participatory, and collaborative manner (for instance, Widdess, 1994; Seddon, 2005; McCaleb 2014).

This case study consisted of four stages: 1. A rehearsal five days prior to the concert in which I participated as a tanpura player, took notes of the musical issues discussed and worked on by the main performers, and made an audio recording for a comparative musical analysis with the performance itself; 2. The actual performance, in which I also participated as tanpura player, and which was both filmed and recorded for analytical purposes; 3. My own comparative musical analysis of the rehearsal and performance, which allowed me to distinguish aspects of the performance which were either fixed or spontaneous and emergent; and 4. A two-part collaborative musical analysis, in which I invited each performer separately to watch the recording of the performance, check my analysis of the performance, and express their views on how they acted and felt throughout. Overall, this case study allowed me to gain a better understanding of the musical interactions which constitute a sitar and tabla performance as seen from the performers’ perspective,
and learn about some of the issues which may foster or inhibit positive feelings of sociality.

The second pilot case study was also carried out in Edinburgh, based on a performance by professional musicians Mehboob Nadeem (sitar) and Vijay Kangutkar (tabla). This time I was interested, on the one hand, in finding out about the audience’s listening strategies and shared temporal experience while attending a live North Indian classical performance. On the other hand, I also aimed to develop ways of analysing musical interactions between performers during moments of heightened connectivity. For the first part of this study, fifteen listeners were selected from the audience and asked to participate by completing a brief online questionnaire. A series of questions regarding the interviewee’s listening strategies were then posed. Interviewees were asked to remember their subjective experience of the performance as vividly as possible, and questions were designed to encourage such recollection by focusing on ‘how’ they listened rather than ‘what’ they listened, as suggested by Petitmengin (2006). Finally, a few background questions were asked in order to determine each interviewee’s degree of musical expertise.

For the second part of this study, I identified specific moments during the performance which seemed to me to manifest heightened connectivity among performers. Unlike both the previous and subsequent case studies, I had no access to the performers’ actual experience in this case. Musical passages were therefore considered as highly connected due to a combination of factors, such as the performers’ physical gestures (smiles, looks, nods of approval, etc.), the quality of
their musical performance (clarity of ideas, virtuosic technique, high level of response between musicians, etc.), and my own personal experience as a member of the audience. Overall, this case study offered me a glimpse into listeners’ personal musical experiences, allowed me to test methods of musical analysis, and gain further insight as to the musical interactions that are likely to foster positive feelings of sociality at a professional level.

Figure 3 Shyam Rastogi (right) and Sandeep Rao (left), after performing in the house of legendary Varanasi tabla player Pt. Krishan Maharaj.

The third pilot case study was carried out in Varanasi during my first visit in August 2013, and involved a combination of methods implemented previously. This study was based on a live performance by professional musicians Shyam Rastogi (sitar) and Sandeep Rao (tabla) (see Figure 3), whom I met through Keshava Rao Nayak, my former tabla teacher and Sandeep’s father. Shyam and Sandeep are cousins who
grew up in the same house and have been practicing and performing together on a regular basis for the past twelve years. After watching several of their performances, I was positively impressed by their level of musical rapport, and by what seemed to be a close and affective personal relationship. Moreover, Shyam and Sandeep were also carrying out their own PhD research projects at Banaras Hindu University at the time, which made them particularly open and willing to take part in my research, and overall, ideal collaborators for a research on musical connectivity.

The performance – which took place for a mixed audience of locals and tourists with varying levels of musical experience and familiarity with this particular genre – was both filmed and recorded. Members of the audience were subsequently asked to fill in a questionnaire involving a few background questions, and asking them to report what part of the solo and duo sections they enjoyed the most and why. Interestingly, several people pointed out aspects of Shyam and Sandeep’s musical and personal rapport, thereby supporting my impression regarding their musical connectivity. For instance, one interviewee who had thirteen years of tabla playing experience remarked: ‘all joyful, astonishing precision’. Another interviewee, who had almost no experience with Indian music, nevertheless stated that he ‘really liked the way they played together, it seems like they have been playing together for a long time’.

The following day I interviewed Shyam and Sandeep in order to learn more about their personal and musical background, about their musical interactions while performing, and about the social feelings accompanying these interactions. In addition, we also watched the video recording of their performance while I asked
them questions regarding the mental and affective processes underlying their musical interactions. Overall, this was a great opportunity to get to know Shyam and Sandeep - who would eventually become the main collaborators on my research’s central case study - and continue to learn more about how sitar and tabla performers interact and feel about these various interactions.

2.6 Final Case Study

After returning from my first fieldwork trip and assessing the several pilot case studies carried out thus far, I decided to shift the emphasis of my research away from the topic of shared musical time and focus instead on the performers’ experiences of sociality. Ironically, it was Professor Justin London who - being well known for his work on musical time - had the insight to mention almost in passing that my real interest seemed to lie in the connectivity between performers rather than in matters of shared temporality. I soon realized not only that he was right, but that shifting my research in this way would help me solve several conceptual and methodological problems I was currently facing. In addition, both Professor London and Dr Moran were very helpful in suggesting ways in which I could approach the question of musical connectivity by working in collaboration with Shyam and Sandeep, who as I already mentioned seemed like ideal informants for this kind of project.

With this new frame in mind, I designed a more extensive case study which was carried out during my second visit to Varanasi in January/February 2014. The goal of this study was to access and compare performers’ subjective feelings of sociality
across several performances, and relate their self-reported feelings with their concomitant musical interactions. In addition, given the close personal and musical relationship between Shyam and Sandeep, I thought it would be interesting to explore how their interactions and experiences varied when playing with less familiar performers. I therefore designed a case study comprised of nine live duo performances, with the following ensemble configurations:

- Shyam and Sandeep playing together x 3.
- Shyam playing with other tabla players x 3.
- Sandeep playing with other sitarists x 3.

While North Indian musicians may often have a main duo partner - as in the case of Shyam and Sandeep, or the famous example of Pt. Ravi Shankar and Us. Alla Rakha - part of being a professional musician involves performing with less familiar, sometimes even completely unknown, partners. Therefore, asking Shyam and Sandeep to perform live with other musicians was entirely within the nature or ‘ecology’ of this genre. Furthermore, I also allowed them to choose who else to perform with, so as to minimize my interference as a researcher.

In addition to Shyam and Sandeep, five other local musicians also took part in this research, all of whom were paid for their time and participation (see Chapter Five, section 5.2, for account on ethical considerations). Every performance took place at the International Music Centre Ashram, a music school and concert venue which is also Shyam and Sandeep’s home. Performances were recorded with a Zoom H4 handy recorder connected to contact microphones placed on the sitar and tabla. This method provided a stereo recording of both performers used for musical analysis,
and a mono recording of each performer on a separate track for precise micro-timing analysis (see Chapter Four). Performances were also filmed with a steady camera capturing both performers on stage for the purpose of musical analysis and video recall.

Musicians were interviewed immediately after each performance on their varied experiences of connectivity and the factors affecting this experience. They were asked to describe their level of musical familiarity (determined by how often they would practice and/or perform together) and their personal experiences throughout this performance. In addition, they were also asked to rate their overall level of connectivity from 1 to 5 (1 being very low and 5 very high) and identify specific moments in which they felt either highly connected or disconnected. These data formed the basis for comparative analysis on the relationship between these performers’ musical interactions, social relations, and their self-reported feelings of connectivity. In addition, it also provided phenomenological insight on what it feels like for sitar and tabla performers to connect while playing together.

As I explained in the opening of this chapter, the topic of musical connectivity can be a delicate issue for several reasons, which is why one of the methodological decisions I made early on in my research was not only to collect my data in contexts of ecological validity, but moreover to try my best to interfere with the performers’ normal musical environment and behaviour as little as possible. This however forced me to compromise over several methodological issues which could have been dealt with better in a studio recording. For instance, during our first interview in August
2013 Shyam stated that one of the most common things to interfere with his musical concentration and potential connectivity was having bright lights, and I therefore made the decision of allowing them to play in rather dark settings. While this compromised the quality of the video recording and stopped me from carrying out detailed behavioural analysis of these recordings in the manner of Moran (2013b), I nevertheless judged it more important to avoid inhibiting their musical connectivity as much as possible. In addition, both Shyam and Sandeep also admitted that they felt somewhat uncomfortable in watching video recordings of themselves play on a regular basis. I therefore decided to only use video recall twice throughout my collaborative work with them (once during the pilot case study, and once during the final study).

However, these videos were still useful in complementing audio recordings for the purpose of musical analysis (see section 2.8). In addition, these videos were also used to support the process of identifying moments of heightened connectivity reported verbally by the musicians following their performance, and in trying to uncover the causes behind performers’ varying feelings of connectivity. For instance, if musicians reported that they felt more connected during the early part of the vilambit section, I would then combine my own recollection as an observer with the actual video recording in order to try to identify the specific moment which performers were likely to be referring to, and use the video in order to analyse what might be generating musical connectivity in that particular instance (see Chapter Five, section 5.5).
Overall, the methodology implemented throughout this case study allowed me to collect a wide range of both empirical and ethnographic data pertaining to musical connectivity in sitar and tabla performance, and from contexts of ecological validity. These data included (i) low-quality video recordings of nine live sitar and tabla performances; (ii) high-quality audio recordings, including both stereo recordings and mono recordings with each performer on a separate track; (iii) a quantifiable and comparative measure of the performers’ varied experience of musical connectivity for each performance; (iv) Identification of high and low moments of musical connectivity from the performers’ first-person perspective; and (v) rich qualitative data regarding social, phenomenological, and behavioural aspects of musical connectivity in this style. A more detailed account of this study’s methodology is provided in Chapter Four, where I present and discuss the various results obtained through this collaborative work.

2.7 Methods of Interview Analysis

Throughout this research, I carried out numerous formal interviews with professional musicians from Varanasi. In these interviews, I explored the topic of musical connectivity by questioning performers on issues related to processes of musical expression, creativity, and interaction; on both personal and social experiences underlying performance; and on their views on the relationship between musical behaviour and felt experience.
The list of interviews was comprised, on the one hand, by those carried out during the various case studies outlined in the previous sections (nine interviews during the final case study, plus one interview during the pilot case study), and on the other hand, by interviews carried out with eight other sitar and tabla performers, including my guru Debashish Sanyal and my former tabla teacher Keshava Rao Nayak. The main difference between these two categories was that questions posed as part of one of the two case studies tended to refer to specific instances during a recent performance, while the remaining interviews tended to be broader. Consequently, the ten study-based interviews provided information regarding performers’ musical actions and experiences during a specific performance, whereas the remaining eight interviews were somewhat more general, and therefore used to complement and expand on information gathered through the studies themselves.

All of these interviews were recorded and transcribed in their entirety, and then analysed in order to extract themes pertaining to (i) mental and affective processes underlining musical interaction, (ii) recurrent factors promoting or inhibiting musical connectivity, and (iii) phenomenological descriptions of the performers’ varied experiences of connectivity. These data were then used to in order to gain insight regarding performers’ subjective experiences of musical connectivity and their behavioural underpinnings. In Chapter Five I present and discuss performers’ reports gathered exclusively by means of the final case study, focusing on topics regarding the relationship between performers’ musical interactions, social relationships, and feelings of connectivity. Chapter Six draws from the entire collection of interviews in order to gain phenomenological insight regarding musical connectivity in this genre.
2.8 Methods of Musical Representation and Analysis

As I mentioned at the opening of this chapter, one of the main challenges I have had to face throughout this research is finding ways of both grasping and representing musical interactions between sitar and tabla performers. Mainly, this problem has to do with the inadequacy of Western notation as a means of describing musical actions that often defy precise pitch and rhythmic categorization. To put it in simpler terms, sitarists may both bend and glide between notes (i.e. mīnd, gamak) and play in a highly melismatic manner, both of which pose difficulties in transcription. And although tabla music is somewhat easier to transcribe, it also poses some problems of its own, such as deciding whether to represent each hand separately, and whether or not to identify each particular drum sound (i.e. bols). Therefore, although I occasionally rely on Western notation in order to communicate some aspects regarding sitar and tabla performance, I also decided to explore other means of translating, explaining, and analysing performers’ musical interactions, and eventually relating these interactions with performers’ self-reported experiences of musical connectivity.

With this aim in mind, I developed several socially-driven empirical methods of musical representation and analysis, all of which I describe in detail in Chapter Four. In sum, these involved quantifying various aspects of performers’ formal, rhythmic, and micro-temporal interactions, and furthermore, paying close attention at how performers mutually affect each other’s musical behaviour. These various empirical approaches offer the advantage of describing certain qualities of musical interaction in a simple and objective manner, while also facilitating comparative analysis across
a large number of performances. However, I also came to the conclusion that these empirical methods of musical representation are – as Western musical notation – ultimately rather inadequate in conveying the rich, sensuous, and dynamic nature of ensemble performance.

I therefore also decided to adopt another complementary approach to musical representation and analysis, which involved selecting brief video and/or audio extracts of sitar and tabla performances, and producing videos which incorporated various texts describing significant aspects of the performers’ musical interactions. Although the precise format of these videos varies according to what aspect of musical interaction I am currently trying to describe, in general I identify certain relevant aspects of both performer’s musical actions as they are taking place, while also keeping track of the underlining metric framework (i.e. tāl) regulating these interactions (see Chapter Three, section 3.2.4). I consider these videos – all of which are found in this dissertation’s accompanying DVD - to be in many ways the most effective way of providing the reader with a direct and vivid explanation of how sitar and tabla performers interact.

2.9 A Question of Musical Capability and Authority

Before bringing this chapter to a close, I should admit that one of my main worries regarding the data collected through the collaborative case study with Shyam and Sandeep was that – being relatively young upcoming musicians - their performances might be of a slightly lesser quality than those of highly acclaimed performers, which
would therefore diminish the value of this research. In fact, even Shyam and Sandeep expressed this concern during our first interview. For instance, Sandeep urged me not to get my views only from them, but to meet and interview other musicians too, and both of them pointed out how the connection between great music masters seemed to greatly surpass theirs. However, after much reflection on this issue I came to the conclusion that - in addition to the methodological advantages of working with Shyam and Sandeep, such as access, openness, the possibility of extensive collaboration, and the development of rapport between researcher and informants – the results from this case study ultimately stand as inherently interesting in themselves, as well as offering a valuable contribution to our understanding of mankind’s shared capacity for musical connectivity.

There are several reasons why I came to this conclusion. First of all, I should point out that although neither Shyam, Sandeep nor any other of the performers taking part in the case study were at the master level of people like Budhaditya Mukherjee or Anindo Chaterjee, they were all nevertheless professional and accomplished performers, with many years of disciplined training behind them. My impression is that in other musical styles and contexts all of these musicians would be considered rather outstanding, but that due to Hindustānī music’s notoriously high standards, they were normally considered by their peers as merely average.

Second of all, due to the subjective nature of musical connectivity, it is not even entirely certain whether highly acclaimed music masters actually experience stronger connectivity than Shyam, Sandeep, or any of the other musicians taking part in this
research. Although, on the one hand, the musical interactions between music masters are certainly more expressive, technically impressive, and coordinated, I also suspect it is very likely that their fame, and therefore their ego, may sometimes get in the way of their connectivity (see Clayton & Leante, 2015). Moreover, posing the question of musical connectivity as a shared human capacity implies that every person’s experience is equally representative of this phenomenon, and therefore equally valid as a focus of research. Thus, I eventually decided it was more important to work with musicians with whom I could develop a close and honest relationship, rather than with famous musicians, who I did not have access to at the time anyway, and who would most likely be unwilling to cooperate and open up to an unknown PhD student.

Part of the reason for bringing this up is that - in my opinion - this issue reveals an underlining association between musical capability and musical authority which undeniably characterizes the world of Hindustānī music, and which has rarely been openly challenged by Western researchers. It is interesting to note that while various other styles may also place similarly high technical demands, this issue seems to be particularly pervasive – and I believe, potentially harmful – in the case of North Indian music research. For instance, although Jazz normally requires similar levels of technical virtuosity, throughout my research I have come across several investigations which focus on either University student performance (such as Seddon, 2005; or Hart & Di Blasi, 2015) or what appear to be fairly average professional musicians (for instance Doffman, 2013), but which as far as I know are never criticised for not representing this style’s very highest musical standard. There
are many reasons why Indian musicians bestow musical authority on elderly, more experience and capable musicians. However, I am more interested in unravelling why Western ethnomusicologists have rarely explicitly challenged authoritative hierarchy inherent to Hindustānī music.

I can think of three reasons behind this. Firstly because, until recently, most research on North Indian music has focused either on this music’s history, social environment, texts and concepts, or creative/pedagogical concepts. In this case, one could validly argue that the older and more knowledgeable musicians should rightly be considered as authorities on these various issues. However, this does not hold true for research focusing on musical and social experience, which is a much more egalitarian phenomenon. Secondly, this situation may also be due to the fact that most ethnomusicologists focusing on Indian classical music will have a guru, who is normally seen as a highly authoritative musical figure (Kippen, 2008), and that participating in this pedagogical practice may in some ways limit the researcher’s possibilities or desire to challenge authority. And thirdly, because as Rice (2008) explains, ethnomusicologists’ aims of becoming an accomplished musician may interfere with their aim of carrying out an objective, impersonal assessment of their musical environment, and therefore accepting certain values without too much consideration.

Having said so, I cannot deny that the question of how musical masters connect, and how their connectivity is either similar or different to less capable performers, does not also have great academic interest, and that pursuing this question would not
draw further light on a research of musical connectivity, both as a shared human capacity and as a phenomenon pertaining to *Hindustānī* performance. I am simply arguing that a study which focuses on upcoming musicians may also provide valid insight on this topic.

Therefore, whilst I did not have direct access to any such master, I decided to carry out a detailed analysis of a commercial recording by *Pandit* Nikhil Banerjee and Zamir Ahmed Khan of *rāg Sindhu Khamāj*, performed live in Amsterdam in 1972 (Banerjee & Khan, 1972). My initial aim was to carry out an analysis of a performance by two well-known and highly acclaimed North Indian musicians, thereby ensuring that the results were representative of the highest quality of Indian classical music. Nikhil Banerjee is widely considered to have been one of the greatest sitar players of the 20th century, and therefore clearly conforms to this requirement. Unfortunately, I know little about Zamir Ahmed Khan, other than that he was from the *Farukhabad* tabla *gharānā* and was based in Amsterdam (idem). The main reason why I nevertheless chose this particular commercial recording is because it was the only one I could find in which the sitar and tabla are panned to almost entirely separate channels, thereby allowing me to identify and measure the onsets of each performer’s musical actions for the purpose of micro-temporal analysis (see Chapter Four). In addition, the fact that the performance took place in front of a live audience contributes further to its authenticity and ecological validity. While I would have ideally preferred to base this analysis on a recording in which the tabla player is of an equal stature to Nikhil Banerjee (such as Pt. Anindo Chaterjee or Pt. Swapan Choudry), one can assume that Zamir Ahmed Khan must have been a proficient tabla
player in order for Nikhil Banerjee to agree to both play with him and produce a commercial recording. This assumption is confirmed, as far as I can hear, by the quality of his playing in this particular record.

2.10 Chapter Summary

Throughout this research I have tried to overcome the afore-mentioned methodological challenges involved in investigating subjective experience and its relation to musical interaction in various ways.

Firstly, by carrying out fieldwork in India, and taking sitar, vocal, and tabla lessons, all of which allowed me to develop close relations with expert informants, gain a better understanding of the social environment within which this music is embedded, and reflect on my own musical experience in real time.

Secondly, by carrying out a prolonged collaborative case study with professional performers Shyam and Sandeep, as well as five other local musicians from Varanasi. This work enabled me to access performers’ subjective musical experiences and collect a wide range of qualitative and quantitative data through which to explore the question of musical connectivity from both behavioural and phenomenological perspectives. Moreover, all data were collected in contexts of ecological validity and an effort was made to be as unobtrusive as possible to allow performers to feel comfortable and hopefully connect freely.

Thirdly, by developing novel methods of musical representation and analysis (described in detail in Chapters Three and Four) by which to grasp sitar and tabla
performers’ musical interactions from a dynamic and relational perspective, in order to then explore the relationship between these interactions and performers’ self-reported feelings of sociality.

And fourthly, by carrying out an in-depth analysis of a commercial recording by master musicians Nikhil Banerjee and Zamir Ahmed Khan, in order to gain broader perspective on how highly skilful and accomplished performers interact.
3.1 Introduction

In this dissertation’s opening chapter, I proposed a model of musical connectivity by which to deduce performers’ social experiences depending on the levels of reflective awareness involved in various kinds of musical interactions (see sections 1.4 and 1.5). According to this model, interactions involving high levels of reflective awareness of the other person’s separate intentional agency promote intersubjective states, whereas interactions involving low levels of reflective awareness result in co-subjective states. Thus, by establishing the extent to which sitar and tabla performers rely on either reflective or pre-reflective forms of interaction, one can uncover certain aspects of their musically-induced experiences of self and other.

In order to apply this model, we must begin by familiarizing ourselves with the various musical behaviours that characterize this style, as well as with the various musical and social concepts that support and underlie them. The purpose of this and the following chapter is therefore to gain understanding of the musical interactions among sitar and tabla players, and explain how these interactions are situated within, and regulated by, shared musical and social ideas, while largely postponing considerations of the social experiences that permeate these interactions for Chapters Five and Six.
In this chapter, I take the first steps towards understanding how sitar and performers interact by (i) describing the social contexts within which such performance usually take place; (ii) explaining basic North Indian musical concepts such as rāg, tāl, lay, and tihāī; (iii) outlining each participant’s role and responsibility in enacting these concepts; and (iv) describing some aspects regarding the process of improvisation in this genre. This description - which is based primarily on the works of Neuman (1980), Kippen (1988), Clayton (2000, 2005), Jairazbhoy (2011), Moran (2013a), and Clayton & Leante (2015), as well as on my own research and musical analysis – encapsulates the manner in which the topic of musical interaction in Hindustānī performance is normally discussed.

Readers who are already knowledgeable on North Indian classical music are likely to be familiar with most of what is said here, and may wish to proceed directly to the following chapter. There are nevertheless several reasons why I include this content in this dissertation. Firstly, for readers who are not familiar with this genre to be able to situate the subsequent analyses and discussions within this music’s social and theoretical background. Secondly, in order to introduce and clarify the meaning of certain musical terms which will recur throughout the remainder of this thesis. And thirdly, in order to show that, while informative, most of the existing literature on Hindustānī music fails to address performers’ musical interactions from a truly social perspective, and can therefore only make a limited contribution to our understanding of how these interactions may lead to heightened social experiences.
3.2 The Social Environment of Hindustānī Performance

I now provide an initial overview of the social environment in which sitar and tabla performances are likely to occur. The purpose of this section is to situate the subsequent account of their musical interactions within a defined ecological context, and begin to introduce some aspects of their socio-cultural milieu that may likely affect the way in which musical interactions either promote or inhibit feelings social cohesion. I have also tried to make the following description as graphic as possible, so that readers who are not familiar with Hindustānī music can get a sense of the atmosphere within which sitar and tabla performances often occur. A more comprehensive discussion of the various social issues raised in this section is reserved for the following two chapters.

A sitar and tabla performance can take place in a wide range of settings. Two of the most common ones are, on one hand, small privately-owned venues for a handful of listeners (traditionally referred to as mehfils), and on the other, concert halls drawing large, and largely anonymous, audiences. These two settings represent two historical instances in the development of North Indian classical music. The first originated throughout the Mughal period, when musicians would play for, and be supported by, wealthy patrons (Neuman, 1980). The second developed after independence, at a time in which musicians were forced to appeal to a larger audience in order to survive financially (idem). Nowadays, my impression is that both of these contexts may be attractive to performers in their own way: the first ensuring knowledgeable and appreciative listeners with whom performers can communicate in a direct and intimate manner; the second reflecting greater popularity and outreach, as well as
the possibility of a higher wage. In any event, I would argue that the musical actions which constitute a sitar and tabla performance are to a great extent the same in either context.

As I mentioned in Chapter Two, although sitarists may have a recurrent duo partner - a tabla player with whom they have played and practiced together many times and developed a lasting musical, as well as social, relationship – it is also common for musicians to meet just moments before stepping on stage. This can be a potential source of anxiety for both the sitarist - who might be unsure as to the qualities of his accompanist - and for the tabla player - who must quickly adapt to the sitarist’s personal style. It is therefore common for the sitarist to request a certain tabla player before agreeing to perform, a request which however is not always granted, particularly during music festivals when organizers might hire a small number of tabla players to accompany several soloists (Kippen, 1988). In this scenario, performers will normally have some time backstage to get to know each other and determine certain broad aspects of the upcoming performance.

As the performers step on stage they may commonly be praised by the organizer, and offered some kind of gift such as flowers or garlands. After putting these gifts aside, they must make themselves comfortable and fine-tune their instruments, a process which may take some time, and which must be repeatedly carried out throughout a performance both due to the importance bestowed on accurate tuning and the ease with which both instruments can slip out of tune. Once this is done, the sitarist will announce the rāg (i.e. melodic framework, see section 3.2.3) that he or she will be
playing, and possibly other aspects of the performance’s formal outline. It is also quite common for the sitarist to share some anecdotes related to the rāg or gats (i.e. melodic compositions) about to be performed. As Neuman (2012) notes, sharing this kind of conceptual information is key in establishing musical communication and rapport between performers and knowledgeable listeners.

Unlike Western musicians, Indian performers always sit on the floor, normally on a raised stage which separates them physically from their audience. Audiences may be sitting on chairs, on the floor, or a combination of both, according to each listener’s preference and the venue’s seating arrangement. Senior musicians and connoisseurs - who, by their mere presence may have a significant effect on a performance’s outcome (Neuman, 1980) - are likely to sit in the front rows, thereby enabling a more direct interaction with the performing artists. The sitarist is likely to sit closer to the centre of the stage and face the audience directly, whereas the tabla player will sit on the sitarist’s right side and in a perpendicular position so as to face both the sitarist and the audience.

This seating arrangement both reflects and facilitates the enactment of each participant’s specific musical role (see Napier, 2007; Moran, 2013a; Clayton & Leante, 2015). The sitarist is normally considered to be the main artist. He or she plays the longest, makes most musical decisions regarding repertoire, and often receives the highest wages (Clayton & Leante, 2015). Conversely, the tabla player is seen to fulfil the role of accompanist or co-artist. He (professional tabla players are rarely women) is there to support the main artist and occasionally demonstrate his own virtuosity
when given the opportunity. Sitarists may sometimes conceive themselves as occupying not only a higher musical role than tabla players, but a higher social position as well, an idea which, if externalized, may lead to conflict (Clayton & Leante, 2015; see Chapter Five). However, as Clayton and Leante point out, ‘open friction is rare. Normally, negotiations of status are channelled within and regulated by the normal practices which surround a music performance... making them less visible to the non-expert eye’ (2015, p. 432).

While researchers often highlight listeners’ important contribution towards a successful Hindustānī performance (see Clayton, 2007a; Moran, 2013a; Clayton & Leante, 2015), I would nevertheless argue that listeners are primarily passive participants, in that they are not directly involved in the production of sound. Their role is to remain relatively still and quiet, perceiving and appreciating the sounds and actions produced by the performers, and only occasionally expressing their appreciation and enjoyment through relatively discreet physical and verbal gestures. Moreover, although as both Neuman (1980) and Kippen (1988) point out, listeners used to habitually request specific rāgs and compositions, this is rarely the case nowadays, especially in concert hall situations. Having said so, it is worth pointing out that although listeners’ overt participation is limited, their respectful behaviour and level of musical knowledge are highly appreciated by performers (Moran, 2013a).
3.3 Formal Outline

A typical North Indian instrumental concert may include one or two complete rāg performances – normally lasting between 40 to 90 minutes each - and a shorter, semi-classical piece (i.e. dādrā, dhun, etc.) at the end. Given that classical and semi-classical pieces are significantly different in terms of melody, metre, development, and expression, it is worth clarifying that, throughout this thesis, my focus lies exclusively on the longer, classical portion of a concert.

![Diagram of rāg performance formal outline]

**Figure 4 Complete rāg performance general formal outline.**

A classical rāg performance is in itself normally divided into two main parts; a first part in which the soloist (in this case the sitarist) plays by him or herself, and a second part in which the tabla player joins and both performers play together. The formal outline of one complete rāg performance is summarized in Figure 4.

Performances normally begin with the sitarist playing in a slow and meditative manner, purposefully avoiding any kind of regular beat. During this section – called
ālāp - the sitarist introduces the rāg’s melodic and emotional character step by step, free from any metric constraints. This is done through a process of melodic expansion, in which the sitarist begins by playing a few notes and key phrases surrounding the tonic (called Sa, see sargam in Glossary), and gradually introduces more notes – firstly in the lower register and later in the higher one – until the instrument’s entire register has been covered and the rāg’s identity firmly established. Once this process is completed, the sitarist moves on to the following section, called joṛ. Here, he or she introduces a clear pulse and carries out a similar – although somewhat less rigid - process of melodic expansion, this time complemented by a parallel process of temporal intensification, in which the music becomes increasingly faster and rhythmically denser. This in turn leads to a climactic section called ulti-jhālā, which is characterized by extremely high speed and a specific kind of right-hand rhythmic pattern. This section culminates the process of temporal intensification started in joṛ, thereby bringing the first part of the performance to an end.

Although the tabla player does not normally play anything throughout this first part of the performance, he is nevertheless sitting next to the sitarist at all times, ideally listening attentively and showing his appreciation and enjoyment through both vocal and physical gestures. This kind of behaviour on the tabla player’s behalf is often essential in establishing rapport among musicians – especially when performers are unfamiliar with each other – while also transmitting to the audience proper listening etiquette and musical understanding (Moran, 2013a).
The second part of the performance is of most interest to this research, as it is here that the tabla player joins in, and both musicians interact and connect musically. Most of the duo part of the performance is structured in an episodic manner, as performers take turns carrying out improvised solos while the other accompanies. Although neither performer knows exactly what the other performer will do at any one point, they nevertheless manage to achieve cohesion by - among other things - adhering to an explicit metric framework called *tāl*, which underlies and regulates surface rhythm. In contrast to the first, solo section, the entire joint section of the performance is regulated by *tāl*. Hence, the technical term for this section is *nibaddh*, meaning bound by *tāl*, in contrast to the previous solo section which is *anibaddh* or unbound (Clayton, 2000).

As with the opening solo section, the duo part of the performance is likewise composed of a series of sub-sections ordered according to the principle of acceleration and temporal intensification. Each sub-section is defined by the choice of *tāl* and *lay* (i.e. tempo), and is associated with a brief melodic composition - called *gat* (see section 3.2.6) – which acts as a refrain. The number of such sub-sections (or *gat* sections) throughout the duo part of the performance may normally range from one to three, although having two is presently the most common approach. Each *gat* section may contain several sitar and tabla improvised solos. In the case of there being more than one *gat* section, these are conventionally ordered from slowest to fastest. In other words, a relatively slow *gat* section is normally followed by a relatively faster one, thus resulting in a gradual increase in speed.
This process of temporal intensification culminates in an exceedingly fast jhālā which, although similar to the ulti-jhālā from the opening solo section, is characterized by a different right-hand pattern on the sitar, and more importantly, by the inclusion of both the tabla accompanist and tāl. It is also worth noting that, unlike the preceding sections of the duo performance, the final jhālā section is neither based on a fixed gat nor on a clear alternation of musical roles among performers. Therefore, musical interactions in this final section are somewhat different, and arguably freer, than the ones that precede it. Finally, once performers reach their maximum speed capacity, they normally bring the performance to an end by playing an extended cadential pattern called cakkardār tihāī.

3.4 The Concept of Rāg

Rāg is arguably the most important concept in both North and South Indian classical music. Indeed, any Indian musical performance which claims to be classical must be set and elaborated according to the concept of rāg. Moreover, rāgs are essential in conveying and inducing emotions in both performers and listeners (Clayton, 2005), and hence play a fundamental role in promoting shared social experiences among participants. Issues pertaining to the phenomenology of rāg performance and its contribution to musical connectivity are discussed in more detail in Chapter Six (section 6.5.3). Here I offer a general description of this important musical concept.

Rāgs consist of melodic frameworks for improvisation with ‘infinite possibilities for variation’ (Sorrell & Narayan, 1980, p. 2), which determine the raw melodic materials
for the entire performance. Powers defines *rāg* as ‘a continuum with tune and scale as its extremes’ (in Rowell, 1992), by which he means that they present both the abstract, open-ended qualities of scales and the concrete, identifiable, and memorable character of tunes. According to Jairazbhoy (2011, p. 28), there are more than 200 *rāgs* currently in existence, although my impression - which was corroborated by my *guru* - is that a professional performer will normally have a repertoire of about 30 or 40.

The word *rāg* is said to derive etymologically from the Sanskrit root *raj* or *ranj*, meaning to colour (Jairazbhoy, 2011, p. 28), and a *rāg* is often described as ‘that which colours the mind’. Pt. Ravi Shankar explains this word association in the following manner:

> As a blank canvas can be covered with colors [sic] and forms, so the receptive human mind can be “colored” [sic] or affected by the pleasing and soothing sound of a raga.’ (Shankar, 1970, p. 20)

*Rāgs* are defined by a combination of structural, aesthetic, and affective properties. At the most basic level, a *rāg* consists of a collection of notes (*swaras*), what in Western terminology we would refer to as a scale. In addition, a *rāg* is defined both by the emphasis on certain characteristic phrases, and just as importantly, by the strict avoidance of other phrases. This information is normally summarized by a *rāg*’s ascending and descending scale (*arohi-avrohi*) and ‘catch-phrase’ (*pakad*). In addition, *rāgs* are also defined by the specific weight and functionality assigned to each note (*vadi, sam-vadi*), and by the way in which certain notes are ornamented (for instance *mīnd*, *gamak*, *andolit*, etc.). For example, *rāg* *Yaman* consists of what would be referred to as a Lydian scale in Western terminology (i.e. a major scale with
a raised 4th degree), in which the first and fifth notes of the scale (Sa and Pa) must be avoided in ascending lines, the third note (Ga) receives the strongest structural emphasis, and in which the second and sixth notes (Re and Dha) must be frequently ornamented with a slide (i.e. mînd) from the note above.

In addition, each rāg should be performed during a specific season and/or time of the day (in the case of rāg Yaman, in the evening), and convey its own particular character or mood (ras). This last quality is arguably a rāg’s most subtle level of identity, and although there does seem to be some consensus as to what each rāg’s character or mood consists of (see Bor, 1999; Clayton, 2005; Leante, 2009), this issue nevertheless tends to remain beyond precise verbal description. As Ravi Shankar explains, ‘the total expression of the notes and theme of a raga create an intensely powerful musical entity’ (1970, p.20), often conceived as having an almost human or god-like identity (Clayton, 2005). In Chapter Six I shall elaborate on the implications this has for performers’ sense of musical agency and selfhood.

In a more pragmatic sense, each rāg imposes a unique configuration onto the sitar’s physical possibilities, which the sitarist must learn to embody. As Neuman (2012) explains, the choice of rāg determines both melodic and physical ‘spaces’ the sitarist must explore on his instrument, ranging from the position of the instrument’s frets to string pulling technique (mînd). Some rāgs can be more challenging than others, either due to their emotional intensity and subtlety, their rigorousness in presentation, or due to how they carve physical space onto the instrument itself. The adjustment of the sitarist’s physical behaviour will determine his or her
representation of, and feelings towards, each rāg, which in turn may affect the other performer’s and audience’s feelings through processes of emotional contagion and empathic attunement.

It is also worth noting that experienced listeners are likely to know the general outline of a large number of rāgs. Indeed, one of the main channels through which musicians and listeners communicate is through knowledgeable understanding of the way in which the sitarist presents and develops a rāg (Clayton, 2005). The importance of announcing the rāg in advance and thereby avoiding any ambiguity with regards to melodic content is vividly captured by Neuman (2012), who describes one case in which Ustād Vilayat Khan’s choice of rāg was unclear, leading to harsh criticism and misunderstanding. This anecdote shows that, with a few exceptions, communication between performers and listeners must ideally be as direct and unambiguous as possible.

3.5 The Concepts of Tāl and Lay

As already mentioned, the entire duo section of a performance is coordinated by a metric framework called tāl. As Clayton explains, ‘tāls are conceived as cyclically recurring patterns of fixed length’ (2000, p. 43). Each cycle (āvart) is composed of a specific number of temporal units called mātrās. The first mātrā of the cycle - referred to as sam and represented in notation by an ‘X’ (see below) - receives the highest structural emphasis and is used as a cadential point on which improvisations come to an end.
Mātrās are arranged into specific groups (vibhāgs), thereby creating an intermediate level of metric hierarchy lying in between the level of the individual mātrā and the level of the entire āvart. The number and arrangement of mātrās composing one āvart is the predominant, albeit not the only, way of differentiating tāls. In addition, certain vibhāgs are accented while others are not, contributing further to each tāl’s unique rhythmic character. Vibhāgs which are not accented are referred to as khāli, and are represented in notation by a 0, whereas accented vibhāgs are represented either with an X (in the case of sam) or a number.

Although Clayton (2000) identifies about twenty tāls presently used in North Indian classical music, only a small number of these are frequently used in full-length sitar and tabla performance. The most common ones are (from Clayton 2000, p. 58/9):

<table>
<thead>
<tr>
<th>Rūpak tāl: 7 mātrās, 3+2+2</th>
</tr>
</thead>
<tbody>
<tr>
<td>X/0</td>
</tr>
<tr>
<td>Tin tā trkt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jhaptāl: 10 mātrās, 2+3+2+3</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>Dhin na</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ektāl: 12 mātrās, 2+2+2+2+2+2</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>Dhin dhin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tintāl: 16 mātrās, 4+4+4+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>Dha dhin dhin dha</td>
</tr>
</tbody>
</table>
The main function of tāl is to provide a shared metric framework which allows performers and listeners to synchronize their patterns of action and attention, and thereby achieve precise temporal coordination. In this sense, tāls are similar to Western metres (see section 1.3.2). However, they differ, firstly, in that they provide a more specific and unambiguous form of metrical attending (see section 3.6), and secondly, in that they fulfil a more significant cadential function. Whereas cadences in Western music are normally accomplished through harmonic means, Indian music cadences occur through a combination of melodic and metric means. Essentially, a melody (or rhythmic phrase in the case of tabla solos) needs to reach a point of culmination and repose precisely on sam (i.e. the tāl’s first mātrā). Since Indian tāls can both occupy longer durations and exhibit more complex structures than common Western metres, the point in time in which a cadence can take place in Indian music is, in a metric sense, more specific than in Western music.

There are certain limitations regarding the tempo at which different tāls can be played. Tempo is conceptualized in North Indian music in terms of the durational time-span between two adjacent mātrās (Clayton 2000, p. 75), or put more simply, in terms of mātrās per minute. The common word for tempo in Indian terminology is lay, which is however a slightly ambiguous term as it can also mean rhythmic density, (i.e. notes per mātrā). This ambiguity arose, according to Clayton, because in the past the mātrā would consist of a fixed time unit and speed would be varied solely by subdividing the mātrā according to various ratios (idem, p. 78). This situation has changed dramatically, since ‘nowadays the mātrās of the fastest North Indian music are less than 0.1 sec. long; in the slowest they are over 5 sec. in duration’ (idem).
There are three main tempo categories in North Indian music: *vilambit* (slow), *madhya* (medium), and *drut* (fast). These three categories may be expanded to seven by including very slow and very fast (*ati-vilambit* and *ati-drut*), as well as medium-slow and medium-fast (*madhya-vilambit* and *madhya-drut*) (Clayton 2000, p. 76). Out of the four *tāls* described above, 16-beat *tīntāl* - which is by far the most common *tāl* in instrumental performance – can be played in the widest range of tempos, from *vilambit* to *ati-drut*. The other three are mainly played in *madhya lay*, with the exception of 12-beat *ektāl* which can also be played in *drut lay*.

As I already explained, each *gat* section constituting the duo performance is defined by a certain *tāl* and *lay*, and their appearance is ordered according to the principle of temporal intensification. In other words, a duo performance will normally start with a relatively slow section in either *vilambit* or *madhya lay*, followed by a relatively faster *gat* section in *madhya* and/or *drut lay*, before culminating in the closing *jhālā* section in *ati-drut*. Furthermore, it is also common practice for the music to accelerate within a single *gat* section while remaining within the temporal parameters of a certain *lay* category (see Figure 7, p.110, in Chapter Four), a process which is somewhat analogous to changing gears whilst driving.

### 3.6 Keeping Track of *Tāl*

Given its functional significance as a cohesive temporal framework, performers may verbally state the *tāl* or *tāls* they shall be playing before beginning a performance, and will continuously reinforce the *tāl* in various ways. One way in which listeners can
keep track of tāl is through specific hand gestures, in which the first mātrā of every vibhāg is assigned either a clap (represented in notation by a number), or in the case of unaccented khālī vibhāgs, a wave (represented by a 0). For instance, the hand gestures for 10-beat jhaptāl consist of clap, clap, wave, and clap, each of which is separated respectively by two, three, two, and three mātrās. This corresponds to jhaptāl’s metric arrangement of ten mātrās arranged in 2+3+2+3, including the third unaccented khālī vibhāg which is assigned a wave. Carrying out such gestures allow audiences to reinforce, embody, and communicate their metrical attending.

In addition, each tāl is associated with a specific drum pattern called ṭhekā, which allows both the other performer and the audience to perceive the tāl by providing easily identifiable cues. Ṭhekās are represented vocally through syllables called bols, which are onomatopoeically related to different drum strokes. Bols differ slightly according to the tabla player’s lineage (i.e. gharānā). Generally, Na, Ta, Tin and Tun consist of resonant strokes on the smaller, right-hand dayan drum; Ge is a resonant stroke of the larger, left-hand bayan drum; Dha and Dhin are combination of Ge+Na and Ge+Tin; and Ka and Te are non-resonant strokes on the lower and higher drum respectively.

The way in which bols are ordered allow participants to know their place in tāl unambiguously. The clearest cue, and the one which both the sitarist and the audience will therefore rely on to confirm their place in tāl, is normally the lack of bass drum (bayan) during the unaccented khālī vibhāgs. For example, the ṭhekā for jhaptāl is: Dhin Na | Dhin Dhin Na | Tin Na | Dhin Dhin Na. The lack of bass drum
during the 3rd vibhāg (mātrās six and seven) can be easily noticed by an experienced listener, who will therefore be able to anticipate the upcoming sam and possible cadence.

**Figure 5** Extract of rāg Cārukeśī, performed by Shyam Rastogi (sitar) and Sandeep Rao (tabla), transcribed by author (See Example 1).

As an accompanist, one of the main responsibilities of the tabla player is to play the ṭhekā in a clear way, and yet vary it consistently both in response to what the sitarist is doing and to avoid monotony. Figure 5 consists of a transcription of a short extract of a performance of rāg Cārukeśī, by Shyam Rastogi and Sandeep Rao, which is set to
jhaptāl (see Example 1 in DVD). In this transcription I have highlighted Sandeep’s tabla strokes (lower staff) corresponding to the ṭhekā, while all other strokes are free variations inserted for decorative and interactive purposes, thereby showing the relationship between the pre-existent ṭhekā and the way it is normally played in performance. This form of accompaniment provides enough cues for all participants to know their place in tāl while allowing the tabla player to remain expressive, responsive, and spontaneous.

3.7 The Concept of Gat

Whereas the tabla player provides accompaniment for the sitarist’s solos by playing the ṭhekā, the sitarist provides accompaniment during tabla solos by playing a short pre-composed melody called gat (or, less commonly, bandiś, if the melody is derived from a pre-existing vocal composition). Gats are composed of three lines, called sthāyī, mañjhā, and antarā. The first two lines are normally one tāl cycle long, while the third line tends to be slightly longer. Each line explores, respectively, the instrument’s middle, low, and high register. A gat’s structure is therefore based on the same principle of melodic expansion which structures the opening solo ālāp section. Although gats are composed of three lines, the first one is normally played much more frequently than the other two, which are normally played rather sparingly. Moreover, only the first line is typically used as an accompaniment during tabla solos.
Gats are set to a specific rāg, tāl, and lay, and thereby encapsulate the performance’s melodic and metric structure. A gat’s position within the tāl is fixed - meaning that it will always start from the same mātrā and approach sam in the same way - thereby fulfilling a similar metric function to the tabla’s ṭhekā by indicating the performers’ place within the tāl. The section of the gat which precedes the first beat of the tāl is called the mukhrā and - as we shall see in section 3.8 - plays an important role in providing the sitarist with more options by which to finish his solos on sam.

![Figure 6](image)

**Figure 6** First Line (i.e. sthāyi) of gat in rāg Cārukeśī set to jhaptāl, by Shyam Rastogi, transcribed by author.

As an example, Figure 6 consists of a transcription of the first line (i.e. sthāyi) of a gat in rāg Cārukeśī set to 10-beat jhaptāl, taken from the same performance by Shyam Rastogi and Sandeep Rao. This particular gat starts on beat 8, meaning it has a 3-beat mukhrā (highlighted). This gat also lands on sam on the note Ga, which is structurally significant in this rāg. All of this means that the gat makes both rāg and tāl perceptually audible in a clear and unambiguous manner.

### 3.8 Methods of Sitar Improvisation

Sitar improvisations are structured according to the parameters set by rāg and tāl.

Everything the sitarist plays must comply with the chosen rāg’s melodic and aesthetic principles, as described in section 3.4. In addition, the sitarist’s improvisations are
also structured by the tāl’s underlying metric framework, in that he or she must repeatedly play melodic/rhythmic cadences - and ultimately end his or her solos - on the cycle’s first beat (sam). Due to the momentary predictability which arises from this cadential action, it is here that performers tend to interact most overtly.

Throughout his or her solos, the sitarist will use the gat as a refrain, or in other words, as both a point of departure, and more importantly, a point of arrival. If the gat has a mukhrā, then the sitarist has the choice of either ending his solos on sam or on whichever beat the mukhrā starts, subsequently using the mukhrā to culminate on sam. Another very common device by which both sitarists and tabla players may create such cadence is through a rhythmic figure called tihāī, in which a phrase is repeated three times landing precisely either on the sam or the mukhrā. Tihāīs are often unplanned and spontaneous, and therefore require relatively complex calculations to be carried out intuitively and in an instant. They are also an effective way of directing every participants’ attention towards a specific point in time, thereby creating a strong cadential effect through rhythmic means.

Broadly speaking, sitarists have three ways by which to conclude an improvised phrase; namely, (i) by playing the mukhrā; (ii) by playing a tihāī landing on sam; or (iii) by playing a tihāī landing on the mukhrā. For instance, Figure 5 above (p.96) - consisting of four cycles of jhaptāl with two improvised sitar phrases (i.e. tāns) which are highlighted – exemplifies two of these possible scenarios. The first phrase starts on the 6th beat of the first cycle and ends on the 1st beat of the second cycle, with a tihāī (marked by slurs) which lands on sam. The second phrase starts on the 6th beat
of the second cycle and ends on the 8th beat of the following cycle, with a longer tihāī which lands on the mukhrā. These three possible forms of cadential patterns will be central to my later analyses (see sections 4.4 and 5.6.2) of the rhythmic interactions between sitar and tabla performers.

In addition to the way in which sitarists create cadential patterns, their solos may also be described and distinguished from each other according their predominant rhythmic character. Clayton (2000) proposes two broad categories by which soloists (in this case, sitarists) may approach the process of improvisation. On the one hand, improvisation may be conducted in a melismatic manner resembling ālāp, which although underlined by both pulse and tāl (performed by the tabla player), may appear devoid of such metric constraints through the use of syncopations and rubato. This approach is normally considered more appropriate as a means of presenting and developing the rāg’s melodic character and mood, and may therefore be perceived as somewhat deeper or more expressive and introspective.

On the other hand, improvisations may be approached in what Clayton (based on vocal music) refers to as a syllabic or text/rhythm-oriented manner, in which a strict relationship between surface rhythm and underlying tāl is maintained; or in other words, in which every rhythmic event occurs according to a certain level of metric organization. However, even within this stricter syllabic approach, the relationship between rhythm and metre may nevertheless manifest different levels of rhythmic tension. Sitarists may either play fast, rhythmically-regular phrases called tāns – which is precisely what Shyam does throughout the transcribed extract presented
earlier (Figure 5, p.96) - or alternatively, they may play in a more syncopated and irregular manner.

This second approach – which is referred to as laykārī - is defined by Clayton as ‘the distortion of, or deviation from a steady beat’ (2000, p. 153), and derives etymologically from the notion of working with time (idem). Laykārī passages create rhythmic tension either through odd subdivisions of the mātrā (Ex: playing 7 or 5 notes per mātrā), sudden changes or step-wise increase in rhythmic density (e.g. going from binary, to ternary, to quadruple and quintuple surface rhythm), and rhythmic groupings which challenge the underlying tāl (e.g. playing a 16-beat pattern within 10-beat jhaptāl). Although tāns and laykārī differ in their level of rhythmic tension, they both rely on a metric conception of rhythm, which contrasts with the freer melismatic approach.

As Clayton is careful to point out, ‘there is a degree of overlap and mutual influence between even these two broad categories; a rāg development in apparently free rhythm may elide with a cadential (and more syllabic) tihāī, or overtly rhythmic development may incorporate elements of melisma and rubato’ (2000, p. 137). In other words, in practice sitar solos may often shift in a rather seamless manner from a melismatic to a rhythmic approach. Having said so, I nevertheless consider this categorization useful as a means of describing and distinguishing certain broad aspects of the sitarist’s approach to improvisation throughout a performance, as I shall demonstrate in the analyses in the following two chapters.
3.9 Methods of Tabla Improvisation

Tabla solos are conceptualized according to the method by which rhythmic material is presented and developed. Kippen (1988: 98) broadly distinguishes tabla solos as either set compositions - such as peshkār, mohrā, gat, țukřā, paran and cakkarār – or theme and variation forms - such as qā’ida, chalan, and relā. Set compositions normally consist of a relatively large number of bols (i.e. drum strokes) arranged in a fixed way from beginning to end, whereas theme and variation pieces consist of a small number of bols which constitute the theme, and which once introduced can be rearranged in any number of ways. For example, I was taught the following simple qā’ida by Benares tabla player Keshava Rao Nayak:

\[\text{Dha Dha Tirakita} / \text{Dha Dha Tun Na}\]
\[\text{Ta Ta Tirakita} / \text{Dha Dha Din Na}\]

This theme could then be varied in any number of ways, such as:

\[\text{Dha Tirakita} \text{Dha} / \text{Dha Dha Tirakita}\]
\[\text{Dha Dha Tirakita} / \text{Dha Dha Tun Na}\]
\[\text{Ta Tirakita Ta} / \text{Ta Ta Tirakita}\]
\[\text{Dha Dha Tirakita} / \text{Dha Dha Din Na}\]

Or:

\[\text{Dha Tirakita Tira} / \text{Kita Dha Tirakita}\]
\[\text{Dha Dha Tirakita} / \text{Dha Dha Tun Na}\]
\[\text{Ta Tirakita Tira} / \text{Kita Ta Tirakita}\]
\[\text{Dha Dha Tirakita} / \text{Dha Dha Din Na}\]

Whereas, according to Kippen (1988), tabla performers in the past would maintain the purity of each of these forms, he found that by the time of his research in the mid-1980’s ‘many of the individual compositional types were mixed together to form
larger, hybrid forms... the tendency in young tabla players today was to begin with a qā’ida, turn it into a relā, and then round it off with a ṭukṛā, or cakkardār’ (1988, p. 98). He also noted that some young tabla performers such as Zakir Hussain may very seldom ‘play anything which can be called a traditional form’ (Jnan Prakash Ghosh; in Kippen, 1988, p.103). This change, which was brought about at least in part by the need to please larger and less knowledgeable audiences, continues to be the common practice to this day.

Furthermore, Kippen suggests that these changes in the approach towards tabla solo are likely to have been brought about by changes in the overall form of instrumental duo performance. In the past, the tabla player’s role would mainly consist of accompanying the soloist by giving a straight (sidha) ṭhekā – or in other words a simple accompaniment - and would rarely get a chance to show his own technical expertise and knowledge, which would therefore be saved for tabla solo recitals. Another style of accompaniment which was common in the past was referred to either as the larant (i.e. fighting) or sath sangat (i.e. together-accompaniment) style, in which ‘the tabla player would respond to the tāns... of the instrumentalist by playing set compositions, or improvising, simultaneously’ (Kippen, 1988, p. 102).

At present, both of these styles of accompaniment have been replaced by the modern form in which performers take turns carrying out improvised solos while the other accompanies. This change – which it is generally agreed to have been brought about by Pt. Ravi Shankar and Us. Alla Rakka in the 1950’s and 1960’s – requires the tabla player to carry out solos which keep the mood previously established by the
soloist. Kippen (1988, p. 103) provides a number of examples by which this can be achieved, such as maintaining the same rhythmic density (i.e. *lay*), producing a similar timbre, and either copying specific rhythmic material or the overall formal outline of the sitarist’s previous solo.

3.10 Chapter Summary

The purpose of this chapter has been to introduce readers to important musical concepts and social contexts underlying and regulating sitar and tabla performance, as a first step towards understanding how these performers interact and connect. I have noted the importance of *rāg*, *tāl*, and several rhythmic and formal frameworks in allowing sitar and tabla performers to improvise while remaining cohesive. These interactions are further shaped and supported by a clear distinction of musical and social roles as soloist and accompanist. This information will be of value throughout the remainder of this dissertation as we attempt to understand how these various interactions relate to performers’ social experiences. However, it is also worth noting that this description conveys relatively little information regarding the emergent, dynamic quality of such interactions, and can therefore provide only limited insight regarding sitar and tabla performers’ musical connectivity. Thus, in the following chapter I introduce several methods of musical analysis specifically designed to capture these performers’ joint actions from a ‘relational’ (Marsh et al., 2006) perspective, which shall later be used to explore the relationship between
performers’ musical behaviour and concomitant feelings of sociality (see Chapter Five).
Chapter Four – A ‘Relational’ Analysis of a *Vilambit*
Performance by Pt. Nikhil Banerjee and Zamir Ahmed Khan

4.1 Towards a More Socially-Driven Approach to Musical Analysis

The description presented in Chapter Three exemplifies and summarizes most of the current literature regarding the musical and social interactions between sitar and tabla performers. Although informative, I would argue it is still rather abstract and individualistic. It explains the various musical concepts that underlie *Hindustānī* instrumental performance, and accounts for both soloists’ and accompanists’ separate actions. However, it conveys relatively little information regarding performers’ joint musical behaviours, nor how they thereby co-create a performance together. Put differently, this literature has little to say as to how performers’ actions are mutually affected by their co-performer’s concurrent actions, and how this leads to the spontaneous emergence of various expressive and structural aspects that come to define the outcome of a performance.

In order to infer the level of reflective awareness involved in various kinds of musical interactions – and thus the states of shared subjectivity that underlie them (see section 1.4) – we need, as Marsh et al. explain, ‘procedures and behavioural measures that are inherently relational’ (2006, p. 21). In other words, in order to establish the extent to which a performer’s action did or did not involve awareness of the other performer’s action, we need to explore both of these actions in relation to each other. If we can show that a certain action was likely triggered by a conscious
understanding of the other performer’s musical intentions, we may then deduce that it led to a state of intersubjectivity. Conversely, if we can show that a certain action was not triggered by a conscious understanding of the other performer’s musical intentions, we may then deduce that it led to a state of co-subjectivity. I therefore maintain that in order to learn about how sitar and tabla performers bring forth these various states of shared subjectivity, it is necessary to overcome the individually-centred perspective on music-making which has tended to predominate musicological research (see Moran, 2014) and develop more socially-driven approaches to musical description and analysis.

With this purpose in mind, this chapter presents an in depth, ‘relational’ analysis of a commercial recording of a live 1972 performance of rāg Sindhu Khamāj by sitar player Pt. Nikhil Banerjee (NB), accompanied by Zamir Ahmed Khan (ZAK) on tabla. The entire performance lasts approximately 70 minutes and consists of a relatively brief ālāp (without jor), a vilambit (i.e. slow) section in 16-beat tīntāl, a drut (i.e. fast) section also set to tīntāl, and a jhālā section finishing with an extended question and answer passage, referred to as sawāl jawāb in Indian terminology. My analysis will focus exclusively on the vilambit section, which lasts approximately 32 minutes and therefore encompasses almost half of the entire performance’s duration (the complete recording of this vilambit performance can be found in the accompanying DVD, Example 2).

After providing an initial overview of this vilambit’s overall formal structure and rhythmic character, I analyse performers’ musical interactions at a (i) formal, (ii)
rhythmic, and (iii) micro-temporal level. The purpose of this analysis is to explore how performers’ actions relate to, and are mutually affected by, each other across these distinct temporal levels, and how this process of mutuality leads to the emergence of various musical structures and expressive qualities. The reason for focusing only on the slow vilambit section is mainly in order to extract precise and reliable onset data for micro-temporal analysis. This is unfortunately not possible at higher speeds, since onsets tend to be separated from each other by very short time frames of only a few milliseconds, therefore no longer producing distinct attacks which can be distinguished from each other. This is particularly true regarding the sitar, which due to its many strings has a less sharp attack than the tabla.

The aims of this analysis are (i) to gain further insight as to how sitar and tabla performers interact from a perspective of mutuality and emergence (Marsh et al., 2006); (ii) introduce methods by which to grasp and eventually relate these interactions with performers’ self-reported feelings of sociality; (iii) consider the extent to which these interactions involve various levels of reflective intentional awareness; and (iv) propose specific hypotheses pertaining to the possible relation between certain kinds of musical interactions and concomitant experiences of musical connectivity. By doing so, this chapter lays both the conceptual and methodological ground by which I will subsequently explore the relation between performers’ contextualized musical interactions and their varied feelings of sociality in the following chapters.
4.2 Initial Analysis

In order to familiarize myself with this particular performance, I began my analysis by identifying and tabulating some broad aspects of both performers’ musical actions throughout the *vilambit*. Table 1 below is an example, based on the second sitar solo (S2), of the kind of tabulation I carried out for the entire *vilambit*.

**Table 1** Description of musical interactions during second sitar solo of rāg Sindhu Khamāj, by Pt. Nikhil Banerjee and Zamir Ahmed Khan.

<table>
<thead>
<tr>
<th>Solo, N.Cyc.</th>
<th>Time</th>
<th>Nikhil Banerjee</th>
<th>Zamir Ahmed Khan</th>
<th>Tihāi NB</th>
<th>Tihāi ZAK</th>
<th>Rhythmic Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2, 8 c.</td>
<td>6:06-9:15</td>
<td>ālāp style –</td>
<td>ṭhekā, with</td>
<td>2</td>
<td>0</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Melismatic</td>
<td>minor variations and little interaction.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 c.</td>
<td></td>
<td>Very sparse</td>
<td>Anticipates NB entrance with trill.</td>
<td>1</td>
<td></td>
<td>ZAK anticipates NB’s entrance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>texture, ending</td>
<td>Doesn’t sync tihāi.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>with a quiet tihāi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>which is altered at the end to soften its cadential effect.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 c.</td>
<td></td>
<td>Gentle sound,</td>
<td>ṭhekā with minor variations, and soft cadences in both cycles.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>skips cadence in 1st cycle, gives a soft tihāi -like cadence in 2nd cycle.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 c.</td>
<td></td>
<td>Arrives ‘late’ on sam in 1st cycle, plays tihāi -like pattern ending on mukhrā in 2nd cycle.</td>
<td>ṭhekā with minor variations and very soft cadences.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 c.</td>
<td></td>
<td>1st cycle ends with short but clear tihāi, 2nd cycle skips sam, 3rd cycle ends on mukhrā.</td>
<td>ṭhekā, plays clear cadence on 3rd cycle only.</td>
<td>1</td>
<td></td>
<td>ZAK’s cadence on NB’s mukhrā.</td>
</tr>
</tbody>
</table>

The first column identifies the instrument carrying out the solo (S stands for sitar, and T stands for tabla), the solo’s sequential position in the performance (Ex: T1, T2, etc.),
and the number of tāl cycles composing it (in this case, eight). The second column indicates the starting and ending time for that specific solo. The third and fourth columns describe some broad aspects regarding each performer’s rhythmic actions, particularly in terms of how the soloist does or does not play cadences on sam, and how the accompanist does or does not respond to these cadences. The following two columns indicate the number of tihāīs played by each performer. The last column indicates their overall level of rhythmic interaction, pointing out specific instances in which their interactions are particularly overt and salient. In addition, the second row summarizes the entire solo’s rhythmic quality, which is then expanded into a more detailed description of what happens during the various sub-sections constituting that solo.

This descriptive analysis provides a detailed overview of this performance’s formal structure, rhythmic character, and general level of rhythmic interaction. Moreover, this analysis offers an initial account of each performer’s musical actions in relation to his co-performer’s concurrent actions, and more specifically, of how each performer’s actions may or may not have been triggered by the co-performer’s actions. What is therefore most insightful about this analytical approach is that it allows one to grasp what both performers are doing simultaneously and in relation to each other, rather than focusing exclusively on the soloist as is more commonly the case (for example, Sorrell & Narayan, 1980).

Based on these data, Figure 7 (p. 110) summarizes various aspects of this vilambit’s formal and rhythmic outline. Each bar represents one complete cycle of the 16-beat
tāl. The height of each bar represents each cycle’s average tempo in terms of mātrās per minute, which was measured by extracting the duration of each cycle to the nearest 0.1 second. Blue bars represent cycles consisting of tabla solos and red ones consist of sitar solos. I also identify and label the sequential number of each instrument’s solos: for instance, T1 and S1 respectively mean first tabla solo and first sitar solo. One can therefore easily count both the number of sitar and tabla solos constituting this vilambit, as well as the number of cycles (represented by the number of bars) constituting each solo.

As the plot shows, there are ten sitar and ten tabla solos, plus a closing passage in which NB and ZAK take turns carrying out brief, one cycle long solos for a total of seven cycles. Although this final section is not in a strict question and answer format - meaning that what ZAK plays is not a precise imitation of what NB played before him - I have nevertheless labelled this section sawāl jawāb (which literally means question and answer in Hindi) because the ultimate effect is very similar, and because it is a convenient way of distinguishing this section from the more expansive and personal solos which precede it.
Figure 7 Outline of Nikhil Banerjee and Zamir Ahmed Khan’s formal and rhythmic interactions throughout the vilambit performance of rāg Sindhu Khamāj.
I decided, for both practical and musical reasons, that in order for a passage to qualify as either a sitar or a tabla solo it had to be at least one cycle long. The line which separates a sitar solo from a tabla solo may occasionally be somewhat blurry, due to two main factors. First of all, because solos do not necessarily start on the first mātrā of a cycle, meaning that some portions of a cycle may not distinctly constitute a sitar or tabla solo. However, whilst the beginning of a solo can occur at any place within the cycle, the ending of a solo always takes place on the first beat (sam). Therefore both in this graph, and throughout this analysis, I identify and distinguish sitar and tabla solos based on their endings rather than their beginnings; in other words, once a performer brings his solo to an end on sam I consider the cycle on which that solo ended as the first cycle of the other performer’s solo, regardless of whether it takes that performer several mātrās to commence his improvisation.

The second complication in distinguishing sitar and tabla solos is that performers often complement each other by inserting brief improvisations – lasting a few mātrās, or occasionally half a cycle – within what is essentially the other performer’s solo. This is particularly true whenever the sitarist leaves a gap in his improvisation - either whilst deciding what to play next or in order to retune his/her instrument – and the tabla player fills this gap by carrying out a brief improvisation of his own. However, I would argue that in these situations the tabla player is still fulfilling the role of accompanist, and that therefore these brief passages are still essentially part of the sitar solo. The benefits of correlating entire cycles with either sitar or tabla solos should become more apparent throughout the course of this analysis.
In addition, the plot also indicates NB’s predominant form of rhythmic development, which starts with a melismatic, ālāp-like approach, and finishes in a syllabic tān-based manner. As I explained in Chapter Three, this distinction is posed for analytical purposes, since in practice musicians may often combine melismatic and syllabic rhythms within the same solo. However, listeners will hopefully recognize that this vilambit performance begins primarily in a melismatic, ālāp-like style, and ends with fast tāns. While the transition from a predominantly melismatic rhythm to a predominantly syllabic one is gradual, I propose it happens primarily between S5 and T8, which is why I have labelled this section as both melismatic and syllabic. While such broad distinction between melismatic and syllabic rhythm is somewhat artificial, I shall soon show how certain aspects of the performers’ interactions are closely related to NB’s primary choice of surface rhythm. It is also worth pointing out that such a strong predominance of melismatic rhythm during a major part of the vilambit section is relatively unusual. This kind formal development – namely brief ālāp, no joṛ, and ālāp-style development during a major part of the vilambit section – is in my opinion most likely based on vocal Khyāl framework.

Before moving on to more detailed analyses of this performance’s formal, rhythmic, and micro-temporal structures, one can notice based on this plot (Figure 7) several interesting aspects of NB and ZAK’s musical interactions, most of which reinforce what has been said throughout Chapter Three. Firstly, sitar solos (red bars) clearly encompass a much larger portion of the performance than tabla solos, as a result of the sitarist’s role as main artist. Also, this vilambit undergoes the typical process of temporal intensification on at least two levels. Firstly, there is a gradual increase in
tempo (described by the increasingly longer bars), with a sudden increase at S10, and some interesting local fluctuations which I discuss below. Secondly, this process of acceleration is accompanied by a gradual transition from melismatic to syllabic rhythm, which happens together with an overall increase in rhythmic density (i.e. notes per mātrā) and a change in the sitar’s timbre (from single string Da strokes providing a clean and rather delicate sound, to double string Da Ra strokes which create a louder and more forceful sound).

Although both of these processes are commonplace in sitar and tabla performance, it is nevertheless worth bearing them in mind when we look at the performers’ rhythmic and micro-temporal interactions. Moreover, it is also interesting to note that this shift in rhythmic development is reflected in the performance’s ‘syntagmatics’, a term used by Napier (2007) in reference to the structure which emerges from the performers’ alternation of roles as soloist and accompanist. Solos begin in an expansive manner (T1 to T4), then contract in duration towards the middle of the vilambit (S5 to T8) and expand again towards the end (S8 to S10). This formal process coincides with the rhythmic transition from melismatic to syllabic rhythm just outlined, in that the contraction in solos’ duration occurs at the same time as NB transitions from a predominantly melismatic approach to a syllabic one. To me, this suggests that these two processes are related. The transitional nature of S5 to T8 leads NB to carry out shorter solos, which in turn causes ZAK to respond by also shortening his tabla solos. Thus, this performance’s syntagmatic structure appears to be shaped in part by NB’s rhythmic development, and in part by ZAK’s attunement to NB’s musical intentions.
In addition, Figure 7 also reveals some interesting patterns regarding this performance’s tempo. Firstly, it shows that the process of temporal intensification described in the previous chapter is less rigid than what one might expect (a point which is also made by Clayton (2000, p. 89)), as this plot clearly shows that – within a clear trend towards acceleration – there are nevertheless continuous fluctuations in tempo. Secondly, and more importantly, this plot also shows that these tempo fluctuations are in no way random, as they show clear and consistent patterns. These include, on the one hand, a clear tendency for tabla solos to accelerate consistently from beginning to end, and on the other hand, a clear tendency for sitar solos to begin by decelerating, and then accelerating back to a tempo roughly the same as the initial one.

The consistency with which these tempo fluctuations coincide with syntagmatic structure suggests that ZAK might have a higher level of control over tempo fluctuations - particularly during his tabla solos - that what is normally attributed to tabla players. In other words, contrary to the common idea that the sitarist is solely responsible for determining tempo, this analysis shows that tempo fluctuations may emerge in a non-centrally-directed manner from the dynamic interactions between performers. I shall explore this notion in greater depth in the micro-temporal analysis in section 4.5.
4.3 Analysis of Formal Interactions

In the previous section, I proposed that this performance’s syntagmatic structure was partly shaped by NB’s choice of rhythm and ZAK’s adaptation to NB’s intentions, thus resulting in a contraction in solo duration from S5 to T8. I shall now carry out a more detailed investigation of how performers may have mutually affected their musical behaviours at this level of musical interaction throughout the *vilambit*, and how this process may have also been affected by other social and musical factors.

First of all, it is worth noting that normally neither musician can have a direct effect on the other’s solo duration. Each musician can only decide how long his or her solo will be, and by bringing his/her solo to an end, determine when the other musician may start. Therefore, this aspect of formal structure is inevitably shaped by relatively unspecified and unpredictable interactions. Having said so, anyone familiar with North Indian music knows there is a significant level of regularity in this respect, and it is therefore very likely that performers share a tacit representation of what is deemed appropriate regarding solo alternation. The reason why I refer to this as a ‘tacit’ representation is because - based on my ethnographic and performing experience - performers tend not to openly discuss these issues or come to an explicit agreement as to how a performance’s syntagmatic structure should develop. Rather, they allow this aspect of musical structure to emerge spontaneously according to their ongoing musical interactions. However, I would argue that this process is nevertheless regulated by shared, non-verbalized representations of what is deemed appropriate.
In order to explore what this shared representation may consist of, I measured the duration of each of NB and ZAK’s solos (in seconds), and then calculated (i) their average duration and (ii) the overall percentage of the entire vilambit corresponding either to sitar or tabla solos. The results are summarized in Table 2, which also includes each instrument’s longest and shortest solo duration in order to give a sense of their fluctuation, and the total duration of all sitar and tabla solos combined. I should also point out that I did not include the final sawāl jawāb section in this analysis as I felt it is not representative of what happens throughout most of the vilambit, and including it would therefore distort the final results (essentially by producing lower average figures).

<table>
<thead>
<tr>
<th>N. of Solos</th>
<th>Av. Duration</th>
<th>Longest</th>
<th>Shortest</th>
<th>T. Duration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitar</td>
<td>10</td>
<td>140 s</td>
<td>293 s</td>
<td>1402 s</td>
<td>73%</td>
</tr>
<tr>
<td>Tabla</td>
<td>10</td>
<td>52 s</td>
<td>90 s</td>
<td>516 s</td>
<td>27%</td>
</tr>
</tbody>
</table>

If we take this performance as a model, it would seem that performers share a tacit formal representation in which:

1. The ratio between sitar and tabla solos is 73% to 27%, or roughly 3:1.
2. The sitarist’s solos may range from about 1 to 5 minutes in length, with an average length of approximately 2.5 minutes.
3. Tabla solos may range from approximately 0.5 to 1.5 minutes in length, with an average length of approximately 1 minute.
In other words, I am proposing that – based on this particular performance – sitar and tabla performers determine their formal interactions according to this tacit representation, so that, for instance, if a sitarist plays a relatively short solo, the tabla player will subsequently shorten his solo in order to maintain the approximate ratio of 3:1, and that overall, sitarists solos will stay within the range of 5 minutes in duration, and tabla solos will stay within the range of 1.5 minutes in duration.

In order to find out whether the same conclusions apply to a wider range of performances, I carried out the same analysis for the slow opening gat sections of all nine performances recorded during my fieldwork in Varanasi (see Chapters Two and Five). Since only five of these started with a vilambit section in tīntāl (the other four started with a madhya lay section in jhaptāl), I began by considering the vilambit performances only, and then combined these with the remaining four performances in madhya jhaptāl. The results, which are summarized in the following two tables, were overall very similar to those of NB and ZAK, therefore supporting the previous proposition that performers may share a tacit formal representation which consists of sitar being roughly 2.5 to 3 minutes long, tabla solos being roughly 1 minute long, and with an overall ratio of approximately 3:1.

Comparing Tables 3 and 4, one can see that the choice of lay and tāl (i.e. tempo and metre) had practically no effect on these performances’ syntagmatic structures. The rather small differences are simply a result of the madhya performances being slightly longer than the vilambit ones, which makes every average figure rise by a small amount. However, their number of solos and percentages are essentially the
same. Furthermore, I am confident that the slight difference in duration is coincidental, and is not due to the choice in lay or tāl. Although we would need a larger sample to make any definitive claim, these results suggest that an instrumental performance’s syntagmatic development emerges independently from lay and tāl.

**Table 3** Average syntagmatic values for five recorded performances in vilambit tīntāl.

<table>
<thead>
<tr>
<th></th>
<th>N. of Solos</th>
<th>Av. Duration</th>
<th>Max</th>
<th>Min</th>
<th>Total Duration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitar</td>
<td>4</td>
<td>186 s</td>
<td>260 s</td>
<td>85 s</td>
<td>719 s</td>
<td>72%</td>
</tr>
<tr>
<td>Tabla</td>
<td>4.8</td>
<td>61 s</td>
<td>95 s</td>
<td>35 s</td>
<td>286 s</td>
<td>28%</td>
</tr>
</tbody>
</table>

**Table 4** Average syntagmatic values for nine recorded performances in vilambit tīntāl and madhya jhapṭāl.

<table>
<thead>
<tr>
<th></th>
<th>N. of Solos</th>
<th>Av. Duration</th>
<th>Max</th>
<th>Min</th>
<th>Total Duration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitar</td>
<td>4</td>
<td>192 s</td>
<td>273 s</td>
<td>116 s</td>
<td>757 s</td>
<td>71%</td>
</tr>
<tr>
<td>Tabla</td>
<td>4.6</td>
<td>69 s</td>
<td>98 s</td>
<td>44 s</td>
<td>305 s</td>
<td>29%</td>
</tr>
</tbody>
</table>

Now, comparing Tables 3 and 4 (referring to the case study’s nine performances) with Table 2 (referring to NB and ZAK’s performance), we must begin by noting that NB and ZAK’s performance is almost twice the length of the average duration for the nine performances recorded in India. Interestingly, NB and ZAK’s longer vilambit performance is not achieved by extending the duration of each individual solo (average durations are actually lower than for the nine other performances), but rather by increasing the number of solos. This observation supports the idea that performers’ tacit syntagmatic representation is based on maintaining average solo durations and ratios, which is flexible enough to accommodate to a wide range of performance durations by increasing the number of solos.
One final observation regarding NB and ZAK’s performance is that NB’s average sitar solo duration is noticeably lower than that of the nine performances (140 seconds against 192 seconds), implying that - contrary to what one might expect - NB did not enact his relatively higher musical status by playing exceedingly long solos. On the contrary, based on the comparatively high frequency with which NB and ZAK exchange roles as soloist and accompanist (represented by the large number of solos and relatively low average solo durations) it appears that NB and ZAK’s formal interactions were even more egalitarian than those of the other nine performances, in which none of the performers equalled NB’s status. In the following chapter I shall explore whether relative musical status had an effect on syntagmatic structure across the case study’s nine performances.

4.4 Analysis of Rhythmic Interactions

This portion of the analysis explores NB and ZAK’s rhythmic interactions throughout the vilambit. I look at how one performer’s rhythmic actions relate to – and are possibly triggered by - concurrent rhythmic actions by his co-performer, and how the performance’s overall rhythmic character is thereby co-determined by means of this interactive, dynamic process. The description I offer below is based on the process of identification and tabulation of rhythmic interaction explained in section 4.2 (e.g. Table 1, p. 120).

Before continuing, I should clarify that I explore this question of mutuality primarily by considering how the soloist’s rhythmic actions (i.e. whoever is currently playing a
solo) do or do not trigger certain responses from the accompanist, since this is normally the direction in which performers influence each other’s behaviour. In other words, it is normally the accompanist who must adapt, anticipate, and/or respond to what the soloist is playing, and I therefore explore the performers’ rhythmic interactions from this angle.

Let us begin by considering NB and ZAK’s rhythmic interactions during tabla solos. As is common practice, ZAK almost invariably finishes his solos with a *tihāī*, which give both NB and the audience a clear indication that his solo is coming to an end. Out of the ten tabla solos, NB reacts to ZAK’s final *tihāī* by stressing the cadence - either by synchronizing with ZAK’s *tihāī* or by increasing the sitar’s dynamics and striking the resonant *taraf* strings - on four occasions (T2, T3, T4, and T5). He also has similar though somewhat gentler and less perceptible reactions in three other occasions (T7, T9 and T10), and shows no rhythmic alteration in another three (T1, T6 and T8).

In addition, although NB recurrently varies the *gat* throughout ZAK’s solos, he seems to do so for reasons which appear to me as intrinsically melodic, rather than as a result of what ZAK plays. During most tabla solos, NB follows the same pattern, which consists of playing the *gat* during the first cycle with little or no variation and then varying it significantly during the second cycle. The consistency of this behaviour supports my interpretation that such variations of the *gat* happen, primarily, for intrinsic melodic reasons rather than as a response to ZAK’s actions. I would therefore argue that this behaviour on the part of NB does not involve the kind reflective understanding which may characterize more overt forms of rhythmic interaction.
Focusing now on the performers’ rhythmic interactions during sitar solos, the first thing to point out is that this *vilambit* is based on a conventional *Masītkhānī*-style *gat* starting on beat 12 (see Figure 8 below), which provides NB with the option of ending his solos on either *sam* or the *mukhrā*. Throughout this performance NB takes advantage of both options. However, his way of using the *mukhrā* is often by varying it significantly and weaving it seamlessly to what preceded it, both of which reduce the *mukhrā*’s cadential effect.

![Figure 8 Masītkhānī gat in rāg Sindhu Khamāj, transcribed by author.](image)

During the predominantly melismatic section of the *vilambit* (S1 to S4) NB’s preferred form of cadential pattern is the use of the *mukhrā*. He plays no *tihāīs* throughout S1; two *tihāīs* on S2 and S3; and one *tihāī* on S4. Conversely, he plays the *mukhrā* nine times throughout this section. The combination of *tihāīs* and *mukhrās* provide a total of thirteen instances which might trigger a similar cadential response from ZAK. However, ZAK only accompanies NB with a similar cadential pattern on five of these thirteen instances. In addition, ZAK also plays three *tihāīs* which do not coincide with a cadential pattern by NB, and therefore do not seem to be triggered by him, but rather result from ZAK’s own reaction to the upcoming *sam*. Besides cadential patterns, there are hardly any salient interactions going on between performers at this stage. Based on this, I propose that their level of rhythmic interaction is quite low throughout the early, melismatic stages of the *vilambit*.
In order to illustrate the performers’ rhythmic interactions throughout the opening of the performance in greater detail, I propose to focus on the second sitar solo (S2), which is representative of what happens throughout S1 to S4. The audio extract of this recording can be found in the accompanying DVD (Example 3), where I describe the rhythmic actions taking place in this solo by (i) labelling each of the eight cycles composing this solo (centre, white); (ii) keeping count of the sixteen mātrās composing the tāl (top, blue); and indicating both (iii) NB’s rhythmic actions (bottom left, yellow) and (iv) ZAK’s responses (bottom right, orange).

As one can hear in this video, NB plays throughout this solo in a melismatic manner seemingly detached at most times from the underlying pulse. Meanwhile, ZAK plays a very simple ťhekā with only a few minor variations and embellishments. Regarding cadences, NB plays rather metrically-loose tihāīs in c.1 and c.6, both of which land on sam, and uses altered versions of the mukhrā in c.5 and c.8. During the remaining cycles (c.2, c.3, c.4, c.7) his melodic phrases pause on or near sam without however creating strong cadential effects. One can also hear that the only one of these cadential patterns which triggers a clear response from ZAK is the mukhrā on c.8, where ZAK plays a short but noticeable trill just before sam. Lastly, the only non-cadential point which might be interpreted as an explicit interaction between the two consists of ZAK’s anticipation of NB’s entrance with a trill on c.1 m.4. Overall, this solo – and indeed the entire opening portion of this vilambit - is characterized by a loose coupling between NB’s rhythm and the underlying metric framework, as well as by very little overt interaction between performers.
During the transitional section from melismatic to syllabic rhythm (S5 to S7), NB mostly avoids using the *mukhrā* (which appears only once at the end of S7) and increases the number of *tihāīs* (which happen five times over a much shorter duration than the previous section). Here, the performers’ show even less signs of rhythmic interaction than during the first section, since ZAK only responds to NB’s cadential pattern during the last *mukhrā*.

Lastly, during the syllabic section (S8 to S10) there is a gradual shift in the performers’ rhythmic interactions, which eventually leads to the highly interactive *sawāl jawāb* closing section. In S8, NB plays two *tihāīs* ending on *sam* and concludes this solo with the *mukhrā*, whilst ZAK shows no response at this stage. During S9, NB starts by playing a short descending *tān* ending with a *tihāī* on *sam*, which ZAK quickly synchronizes with, and which constitutes at this point, the most interactive moment in the *vilambit*. NB ends this solo with another *tihāī*, which this time does not trigger any cadential response from ZAK.

S10 is, in contrast to most of what preceded it, quite interactive. To illustrate this, I have made another explanatory video (Example 4) which includes the same kind of labelling as Example 3. Here, NB begins by playing a short *tān* ending on a *mukhrā*-like pattern (c.1), and this *tān* is synchronized by ZAK. NB then plays another short *tān*, this time ending with a *tihāī* followed by the *mukhrā*, and two longer *tāns* ending with *tihāīs* on *sam*. ZAK provides an active țhekā at this stage, which mirrors NB’s active *tāns*, and synchronizes the last two *tihāīs* (c.3 and c.4).
Lastly, the sawāl jawāb section is in its very essence interactive, as here performers must quickly alternate their roles as soloist and accompanist, and must construct their solos in response to what their partner has just played. In addition, both performers end every one of their solos with a tihāī on sam, and ZAK fills empty mātrās left by NB during his sitar solos with trills and other noticeable variations of the āhekā.

Overall, based on this analysis I propose that the performers’ level of rhythmic interaction is very low during most of the vilambit, with a sudden shift towards a more interactive approach at the very end. Why is this so? Although one could argue that this might have been due to a certain lack of technical capacity or maybe shyness on ZAK’s part (presumably as a result of playing with a highly accomplished and established sitarist), my suspicion is that the lack of rhythmic interaction was deliberate, and due primarily to NB’s characteristically deep and introspective manner of playing, which ZAK may have presumably considered to require a sparse and unobtrusive accompaniment. In addition, it may have also been due to this performance’s vocal Khyāl-like character mentioned earlier. Khyāl, I would argue, is normally characterized by lower levels of interaction between musicians than is typically the case in instrumental performance, and I suspect that ZAK may have been aware of NB’s Khyāl model, and thus chosen to provide an accompaniment which would suit this vocal genre.

If this were indeed the case, it would pose a paradox in that performers may be rhythmically ‘coupled’ – i.e. one performer’s actions being strongly determined by
the co-performer’s actions – without necessarily having high levels of interaction. In other words, ZAK may purposefully be choosing not to carry out overt rhythmic interactions precisely because he considers this to be a more appropriate form of accompaniment for NB. However, I would nonetheless argue that this possible scenario would still be characterized by relatively low levels of reflective awareness and understanding of each other’s separate intentional agency, compared to a more overtly interactive performance.

Of course, we can only speculate about what is going on between NB and ZAK throughout this performance in terms of their underlining intentionality and feelings of sociality. However, several performers I interviewed did report that they occasionally felt that sparser accompaniment was indeed more appropriate. For instance, Shyam and Sandeep once described one of their most memorable and highly connected musical experiences (see Chapter Six, p.229), in which Sandeep was so moved by Shyam’s playing he felt there was no need to play anything but a simple ḍhekā as accompaniment. And interestingly, one of the tabla players I interviewed during my fieldwork reported that renown tabla player Pt. Anindo Chatterjee - who used to accompany Nikhil Banerjee on a regular basis - allegedly once stated that looking back at his recordings with NB, he wished he would have played in a less decorative and interactive manner, which he now perceived to interfere with NB’s playing.

Unfortunately, it cannot be determined whether the low levels of rhythmic interaction between Pt. Nikhil Banerjee and Zamir Ahmed Khan in this particular
recording are deliberate or rather indicative of low levels of connectivity. However, I shall explore this issue in detail the following chapter, where I report on the results of my collaborative work with Shyam and Sandeep.

4.5 Analysis of Micro-Temporal Interactions

The following analysis explores the quality and character of NB and ZAK’s musical interactions at a micro-temporal level throughout the *vilambit*. The term micro-timing - it is worth clarifying - refers to a sub-rhythmic level of musical time, normally below the 100 milliseconds threshold of rhythmic perception (London, 2004), and most of the data collected and analysed will therefore fall within this narrow time frame.

The aim of this analysis is to gain insight as to sitar and tabla performers’ joint behaviour at a micro-temporal level, and how this is may be affected by other variables such as alternating musical roles, surface rhythm, and form. This is done by extracting both performers’ onset timing data – i.e. the precise moment in which their instruments are struck and the musical sound initiated – to the nearest millisecond, and analysing these data according to the following three factors: (i) isochronization; (ii) asynchronization; and (iii) interpersonal entrainment.

The term isochronization refers to ‘the standard deviation of tone durations meant to be equal’ (Rasch 1988, p. 75), or in other words, the extent to which a musician’s periodic behaviour departs from a perfectly metronomic beat across determined portions of a performance. The term asynchronization refers to the lack of
synchronization between two performers’ ‘quasi-simultaneous’ onsets, meaning onsets which are meant to be simultaneous but happen at slightly out of sync. Rasch defines asynchronization as ‘the standard deviation of the onset time differences of simultaneous tones’ (p.73). The term entrainment - as explained in Chapter One (section 1.3.2) - refers to the process whereby two or more periodic (or quasi-periodic) rhythmic patterns interact and become coupled (Clayton 2012). An interpersonal entrainment analysis describes performers’ relative phase - i.e. performers’ average position in relation to each other - and strength of coupling - i.e. the consistency with which a certain phase relationship is maintained.

Together, these analyses are meant to provide different yet complementary perspectives on the performers’ musical interactions at a micro-temporal level. The asynchronization analysis describes how tightly performers synchronize their joint musical actions across various sections of their performance. The entrainment analysis describes both how tightly performers synchronize (or how tightly their actions are coupled) as well as their phase relationship (i.e. who tends to play ahead and who plays behind). The fundamental difference between these two methods of analysis is that the first describes performers’ micro-temporal interactions in absolute terms (i.e. milliseconds) while the second does so in relative terms (i.e. in terms of degrees and length of mean vector, determined in relation to the underlying beat). Consequently, they reveal slightly different aspects of micro-temporal interaction and allow for different forms of comparison. In addition, whereas both the asynchronization and entrainment analyses are inherently relational, the isochronization analysis describes each performer’s micro-temporal behaviour
separately. Consequently, this method of analysis can provide valuable information as to how each performer’s individual actions are shaped by variables such as alternating role, surface rhythm, and form, and how his in turn shapes their joint synchronization and interpersonal entrainment.

Although analyses on musicians’ micro-temporal interactions and interpersonal entrainment abound in musicological literature (see for instance, Rasch, 1988; Clayton, 2007b; Lucas, Clayton, & Leante, 2011; Doffman, 2013), this is - to my knowledge - the first analysis of this kind carried out for an extensive portion of a sitar and tabla performance. This investigation will therefore provide insight regarding an important though currently unexplored level of musical interaction in this particular genre.

I begin this report by describing my method of onset data collection, and then present and discuss the results obtained for each of the three separate methods of micro-temporal analysis. I conclude by combining these results in order to provide a more comprehensive picture of NB and ZAK’s micro-temporal interactions throughout this vilambit performance.

4.5.1 Methods of Data Collection

The first step in this analysis involved extracting series of onset timing data for both performers to the nearest millisecond. As already mentioned, this particular recording was selected for analysis because each instrument is panned separately
enough to enable precise onset detection and extraction. In addition, I made several other methodological decisions at this stage.

Firstly, the data collection focused exclusively on onsets occurring on whichever periodic level fell closest to the 600 ms range of maximal pulse salience (London, 2004), following the rationale that periodic events falling within the range of maximal pulse salience tend to ground metrical attending (idem), be most perceptually salient, and elicit overt bodily movement (see Toivianen et al., 2010; London, 2006). Thus, events happening on this level of periodicity are likely to have the strongest impact on the performers’ experience of synchrony and interpersonal entrainment. Since this performance was in a slow tempo averaging 50 mātrās per minute (meaning that the average duration of one mātrā was approximately 1.2 seconds), the periodic level which came closest to the range of maximal pulse salience was at the half mātrā. Consequently, I only extracted timing data for onsets occurring on this periodic level, excluding faster rhythmical events from consideration.

The second deliberate constraint of the data collection concerns the focus on certain kinds of sitar string onsets. The sitar is composed of three sets of strings (i.e. the baj/jora/khaŗaj strings, chikarī strings, and taraf strings), each of which is played in a different way and serves a different musical function. Melody is played primarily on the baj string, and less so on the lower-sounding jora and khaŗaj strings. The chikarī strings are used either for rhythmic accompaniment or as sonic background, while the taraf strings are mainly meant to resonate without actually being struck. Considering that these various sets of strings may manifest different degrees of
synchronization and entrainment with the tabla player, and that the melodic line is normally both more ‘meaningful’ and perceptually salient, I decided to focus exclusively on melodic onsets. In other words, I only extracted data for onsets belonging to the melodic baj string (NB does not play melody on the jora or kharaj strings at any point in the vilambit), and chose to exclude onsets from the rhythmic chikari strings and resonating taraf strings.

Having made these methodological decisions, the method by which to extract the precise timing for the thousands of onsets occurring at a half-matrā level would ideally have been to use software to automatize this process. However, the trial data collected in this manner were found to be too inaccurate and unreliable, apparently as a consequence of the complexity of the sound. Since all data points would require re-checking for validity and accuracy, the decision was taken to extract this timing data manually with Audacity 2.0.6 (2014), a task which involved extracting a total of about 3,000 onsets. I also decided not to extract any timing data for onsets which timing could not be determined within a 5 ms margin of error.

In sum, approximately 3,000 sitar and tabla onsets occurring on the half-matrā periodic level were extracted manually to the nearest millisecond, excluding the sitar’s chikari and taraf strings.

4.5.2 Isochronization Analysis

The following analysis explores NB’s and ZAK’s isochronization - a term which refers to the timing irregularities of tones meant to be of equal duration. In other words, I investigate how NB’s and ZAK’s separate micro-temporal behaviours depart and
fluctuate from a perfectly regular beat. I also explore how this process relates to - and is possibly affected by - other factors such as musical role, surface rhythm, and formal development.

Rasch’s method for calculating isochronization involves three steps. The first step is to extract precise onset timings for each instrument, as explained above. The second step is to measure the time interval between contiguous onsets for each individual performer throughout the entire data set. This is normally referred to as inter-onset interval or IOI. The last step involves calculating the standard deviation for each separate instrument’s IOI sets during each separate solo. These results are presented in Appendix A and in Figures 9 to 11 below.

In order to uncover broader tendencies in isochronization spanning portions of the performance larger than each separate solo, I also calculated each instrument’s mean isochronization for each of the four formal section of the performance (i.e. melismatic, melismatic/syllabic, syllabic, and sawāl jawāb), as well as for all sitar solos and tabla solos combined, and for the entire vilambit. This was done by using the isochronization values of each separate solo to calculate various mean values according to the afore-mentioned formal categories. The reason for doing so in this way - rather than by calculating standard deviation values across these various sections according to Rasch’s methodology - is due to the acceleration this performance displays (almost doubling in speed from beginning to end). As already noted, Rasch defines isochronization as ‘the standard deviation of tone durations meant to be equal’ (p. 75). In the case of this particular performance, the tone
durations at the start are by no means meant to be equal to those towards the end, which is why Rasch’s methodology becomes inappropriate. Specifically, if one were to calculate the standard deviation of tone durations throughout the entire vilambit (or major sections of it), one would obtain a deceptively large value due to the wide range of IOI durations caused by the underlying acceleration. Thus, I decided to overcome this problem by calculating mean isochronization values based on the standard deviation values for each separate solo. While this methodology is not consistent with Rasch’s (which is why I use the distinct term mean isochronization), it has the advantage of allowing one to compare each musician’s isochronization over longer stretches of the performance.

Table 5 Sitar and Tabla mean isochronization figures for various portions of the vilambit

<table>
<thead>
<tr>
<th></th>
<th>Vilambit</th>
<th>T. Solos</th>
<th>S. Solos</th>
<th>Mel.</th>
<th>Mel/Syl.</th>
<th>Syl.</th>
<th>S.J.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitar M. Isoch. (ms)</td>
<td>31</td>
<td>27</td>
<td>36</td>
<td>44</td>
<td>26</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>Tabla M. Isoch. (ms)</td>
<td>37</td>
<td>39</td>
<td>34</td>
<td>46</td>
<td>37</td>
<td>30</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 5 above presents mean isochronization results for the entire vilambit, for all sitar and all tabla solos combined, and for the four main formal sections determined by the sitar’s predominant surface rhythm and form of interaction (melismatic, melismatic/syllabic, syllabic, and sawāl jawāb). It is worth clarifying that higher isochronization values describe a looser, less metronomic micro-temporal behaviour (the isochronization value for a perfectly accurate metronome would be 0 ms). These initial results reveal several interesting aspects regarding these performers’ isochronization and micro-temporal interactions.
Firstly, ZAK has higher mean isochronization values for the entire *vilambit* (37 ms vs 31 ms), as well as for each of the four formal sections, indicating that he played in a less micro-temporally regular manner than NB throughout most of the performance. This finding is rather surprising, given that - due to his role as rhythmic accompanist - one would expect the tabla player to be the one playing in a more regular manner. This may either be indicative of ZAK’s particular style of playing, or of tabla players’ approach towards rhythmic accompaniment in general. Although more data would be required in order to establish which of these two interpretations is more accurate, this finding will be useful in interpreting results from the following asynchronization and entrainment analyses.

Secondly, both performers’ mean isochronization values tend to decrease (i.e. their beat becomes more regular) as they transition from a slower, melismatic performance into a faster, syllabic one. This decrease in mean isochronization values is most pronounced once NB departs from a purely melismatic approach to surface rhythm as of S5, suggesting that this might be the main cause behind the higher isochronization values during the opening section of the performance. In addition, this reduction in isochronization may also be due to the gradual increase in tempo, which, by reducing IOI’s average duration, may also naturally reduce the standard deviation among them.

Thirdly, these results also show a tendency for whoever is playing the solo to have higher mean isochronization values than whoever is accompanying, meaning that the accompanist provides a more stable beat whilst the soloist plays in a more flexible,
less metrically-constrained manner. Having the soloist play in a less metronomic manner is exactly what one would expect, since as Iyer points out, ‘expressive micro-timing represents a departure from regularity, so it is likely to be noticed in relief against the more regular background’ (2002, p. 403). In addition, it is interesting to note that this contrast in mean isochronization is generally more pronounced during tabla solos (27 ms and 39 ms) than during sitar solos (36 ms and 34 ms), indicating that NB’s rhythmic accompaniment during tabla solos is comparatively more regular than ZAK’s. My interpretation of this finding is that tabla players tend to be more responsive and interactive towards sitarists during sitar solos, which therefore makes them follow the sitarists’ micro-temporal fluctuations and play in a less rhythmically regular manner. Sitarists, on the other hand, are less prone to interact overtly during tabla solos, which may therefore support a more regular, isochronous accompaniment.

Figure 9 Tabla Isochronization throughout the vilambit performance of NB and ZAK
Figure 10 Sitar Isochronization throughout the vilambit performance of NB and ZAK

The various observations discussed thus far can be corroborated and expanded by reference to Figures 9, 10 and 11, which show isochronization values (calculated as standard deviations) for both performers (separately and combined) during each solo throughout the vilambit, hereby allowing for a more detailed analysis of these performers’ isochronization in relation to musical role and formal development.

Figures 9 and 10 show each performer’s separate isochronization values for each solo throughout the vilambit. Here one can see that both performers display comparatively higher isochronization values during their own solos, and lower isochronization values when acting as accompanists. This can be easily confirmed by noting that most sitar solo data points in Figure 9 (describing ZAK’s isochronization) tend to be below tabla solo data points, while the opposite is true in Figure 10 (describing NB’s isochronization). In NB’s case (Figure 10), this pattern is firmly established from the beginning, and only disrupted towards the end from S10.
onwards. In contrast, in ZAK’s case (Figure 9) this pattern becomes established from S5 and then maintained throughout until his very last solo in SJ T4.

These two observations imply that both performers’ isochronization may be affected by aspects of rhythmic/formal development. On the one hand, it appears that ZAK’s micro-temporal behaviour during the opening stage of the performance (T1 to T5) is drawn towards playing in a more micro-temporally irregular manner during sitar solos as a result of NB’s melismatic approach (particularly in S1 and S4), which is what causes his isochronization values during sitar solos to be sometimes higher than during tabla solos. Once NB adopts a more syllabic approach as of S5, then ZAK’s accompaniment becomes more regular accordingly (i.e. displays lower isochronization values), and the afore-mentioned relationship between isochronization and musical role is becomes firmly established.

On the other hand, NB displays the greatest contrast in isochronization according to musical role throughout this early stage (meaning that the difference in isochronization during sitar and tabla solos is largest). This is likely due to his melismatic approach towards improvisation, which raises his isochronization values during sitar solos, but which has little or no impact on his approach towards accompaniment. Once he adopts a more syllabic approach, the contrast in isochronization according to role is reduced and eventually inverted at the very end as a result of his solos becoming increasingly syllabic – and concomitantly isochronous – while his accompaniment undergoes comparatively less rhythmic and micro-temporal change from beginning to end. In other words, this gradual inversion
in the relationship between NB’s isochronization and musical role (in which his isochronization values eventually become lower during sitar solos than during tabla solos) may be due to the fact that his increasingly fast, rhythmically-dense, syllabic approach towards improvisation enables more regular micro-temporal behaviour compared to the sparser, more melismatic quality of the gat performed during tabla solos.

Figure 11 shows the combined isochronization values for both NB and ZAK throughout the vilambit. Here we can see in more detail how both performers’ isochronization values tend to be higher and more varied during the opening melismatic section, and how they then decrease and become somewhat more stable (with the anomalous exception of T8) once NB adopts a syllabic rhythmic approach as of S5. As already argued, this is probably due to changes in tempo and surface rhythm, as slower tempos and melismatic rhythms may naturally promote more irregular micro-temporal behaviour.

Figure 11 Combined Sitar and Tabla Isochronization throughout the vilambit performance of NB and ZAK
Lastly, with regards to ZAK’s higher mean isochronization value for the entire *vilambit* noted at the start of this analysis, scrutiny of the data as illustrated Figure 11 shows that this only becomes consistently the case from S5 onwards (with the exception of S8 and SJ S1). This may be due to numerous factors (ranging from personal style to instrumental proclivities) which are hard to establish given the limited scope of this analysis, but which may nevertheless prove informative in trying to establish the causes behind these performers’ asynchronization patterns in the following analysis.

In summary, the results of this analysis reveal a complex relationship between these performers’ isochronization, their alternating roles as soloist and accompanist, and NB’s varying rhythmic approach across the *vilambit*. Whoever acts as soloist tends to display a more irregular micro-temporal behaviour, which – it is argued (see Iyer, 2002) – contributes both towards musical expression and towards making that musician stand out against the co-performer’s more regular micro-temporal accompaniment. This pattern in micro-temporal behaviour is more consistent for NB during the opening melismatic stage of the performance, and more consistent for ZAK during the latter, syllabic stage (for reasons discussed above). In addition, ZAK’s isochronization values are almost consistently higher than NB’s from S5 onwards. Together, these observations imply that both surface rhythm and formal development impact on performers’ isochronization in different yet complementary ways.
4.5.3 Asynchronization Analysis

This next portion of the micro-temporal analysis explores NB and ZAK’s synchronization throughout various sections of the *vilambit* according to Rasch’s methodology. I began by calculating onset time differences for each pair of sitar and tabla quasi-simultaneous onsets happening on the half *mātrā* periodic level. This was done by subtracting sitar onset timing from the tabla onset timing:

\[
\text{Onset Time Difference} = \text{TO (tabla onset)} - \text{SO (sitar onset)}
\]

Since asynchrony was calculated in this manner, positive values indicate that the sitar’s onset occurred before the tabla’s (i.e. NB was micro-temporally ahead of ZAK), whereas negative asynchrony values indicate the opposite. For example, if hypothetically one of NB’s onsets were to occur at 3.500 seconds, and ZAK’s at 3.507 seconds, their asynchrony value would be 7 milliseconds, meaning that NB was 7 ms ahead of ZAK. If however their order would be reversed (i.e. if ZAK were ahead of NB), then the result would be -7 milliseconds. This will become relevant for the following entrainment analysis.

After calculating onset time difference values for each pair of quasi-simultaneous onsets, I calculated performers’ asynchronization during each sitar and tabla solo based on the standard deviation of onset time differences (see Appendix A and Figure 12). In addition, I also calculated asynchronization values for the same larger portions of the performance as in the previous isochronization analysis. This was done by using Rasch’s standard deviation approach, since acceleration did not pose a problem with regards to asynchrony (as it did for isochronization). Table 6 below presents
asynchronization values for major sections of the performance, together with the
isochronization values presented in Table 5 above. Figure 12 presents
asynchronization values for each solo throughout the vilambit.

Table 6 Sitar andTabla mean isochronization and asynchronization values across the
vilambit

<table>
<thead>
<tr>
<th>Vilambit</th>
<th>T. Solos</th>
<th>S. Solos</th>
<th>Mel.</th>
<th>Mel/Syl.</th>
<th>Syl.</th>
<th>S.J.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitar M. Isoch. (ms)</td>
<td>31</td>
<td>27</td>
<td>36</td>
<td>44</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Tabla M. Isoch. (ms)</td>
<td>37</td>
<td>39</td>
<td>34</td>
<td>46</td>
<td>37</td>
<td>30</td>
</tr>
<tr>
<td>Asynchronization (ms)</td>
<td>44</td>
<td>39</td>
<td>44</td>
<td>53</td>
<td>37</td>
<td>32</td>
</tr>
</tbody>
</table>

The first thing to notice from these results is an overall decrease in asynchronization
throughout the course of the performance, which is tied to NB’s surface rhythm. The
opening melismatic section has the highest level of asynchronization (53 ms), which
then decreases during the transitional melismatic/syllabic section (37 ms), and even
more so during the syllabic section (32 ms). This is hardly surprising, since melisma is
defined precisely by lack of metric regularity (as shown by the isochronization
analysis), which in turn is likely to result in a certain lack of synchronization. In
addition, this is also likely related to both performers’ gradual increase in isochronous
regularity across the performance. The slight increase in asynchronization during the
closing sawāl jawāb section (37 ms) may be related to the tabla solo’s greater
prominence, as I shall explain shortly.

Overall, sitar solos (44 ms) tend to be slightly less synchronized than tabla solos (39
ms) throughout the vilambit. However, it is interesting to note that this tendency
varies significantly throughout various sections of the performance (see Figure 12).
Whereas, during the opening melismatic section NB’s solos are consistently less
synchronized than ZAK’s, this is no longer the case from S5 onwards, where – as Figure 12 shows - the difference in asynchronization according to solo evens out. Furthermore, this tendency then becomes inverted during the closing sawāl jawāb section, where tabla solos are consistently less synchronized than sitar solos. How to account for this gradual change in the relation between instrumental solo and asynchronization?

![Figure 12 Asynchronization values throughout the vilambit performance by NB and ZAK](image)

Firstly, the fact that sitar solos are consistently less synchronized than tabla solos from T1 to S4 is probably due to the melismatic character of NB’s playing. NB’S ālāp-like, rhythmically-irregular approach to improvisation during his first four solos naturally result in the highest asynchronization values of the entire performance. In contrast, ZAK’s tabla solos during this opening section are not as strongly affected by NB’s surface rhythm, since NB’s role as accompanist involves him playing the gat in a more rhythmically-regular manner, which contributes towards tighter synchronization.
Later, once NB starts playing in a more syllabic manner, the difference in asynchronization between sitar and tabla solos is significantly reduced. As already noted, the data shows a slight inversion of the previous pattern, as tabla solos now occasionally display higher asynchronization values than sitar solos (particularly T5, T6, T10, and throughout the sawāl jawāb section). This again can be accounted for by NB’s approach towards surface rhythm and by ZAK’s comparatively more irregular isochronization from S5 onwards. During his sitar solos, NB plays in an increasingly syllabic and metrically-regular manner (as described by his decrease in isochronization values) that enables tighter synchronization, and which therefore explains the lower asynchronization values. This change does not apply for tabla solos, since the rhythmic character of NB’s accompaniment (based on the gat) is essentially the same throughout. The fact that asynchronization values for tabla solos (ranging from 28 ms to 55 ms) are more consistent than those for sitar solos (ranging from 16 ms to 64 ms) is likely due to this factor.

In addition, this may also explain why tabla solos tend to be slightly less synchronized than sitar solos once NB starts improvising in a more syllabic manner, particularly so during the closing sawāl jawāb section. Whereas, on the one hand, NB’s sitar solos become more rhythmically regular as the performance evolves, his accompaniment during tabla solos on the other hand has the same rhythmic character throughout. As a result, while sitar solos become increasingly more synchronized, tabla solos remain essentially the same. Thus, the slightly higher asynchronization value during the sawāl jawāb section noted earlier may be accounted for by the following two factors: firstly, tabla solos have become comparatively less synchronized as a result of NB’s
progressive change in rhythmic approach; and secondly, this is the only section in which tabla solos are more prominent than sitar solos. The greater prominence of tabla solos during this closing section raises the asynchronization value in comparison to the previous syllabic section, where sitar solos were more prominent.

4.5.4 Interpersonal Entrainment Analysis
The component of this micro-temporal analysis includes a study of the performers’ interpersonal entrainment throughout the *vilambit*. This measurement explores the relative phase and strength of coupling between timing data collected from the two musicians’ performances. The term relative phase refers to the performers’ micro-temporal position in relation to each other (i.e. who is playing ahead and who is behind, and by how much). Phase relationship (also referred to as a mean vector (μ) or phase attractor) is often measured in degrees, which as Doffman (2013) points out is intended to facilitate comparative analysis across a wide range of tempos. Strength of coupling – a measure determined by the overall distribution of the timing data - is described as the length of mean vector (r) and is measured in a scale from 0 (meaning no coupling) to 1 (meaning perfect coupling). Both of these measurements are normally visualized in the form of circular graphs such as Figures 13 (p.158) and 14 below (p.159).

The first step towards an entrainment analysis involves calculating relative phase relationships for pairs of ‘quasi-simultaneous’ onsets.

\[
\text{Relative Phase} = \frac{360}{(\text{Av. Beat duration} / \text{Onset time difference})}
\]
As already mentioned, onset time differences between pair of quasi-simultaneous onsets were calculated by subtracting tabla values from sitar values. Consequently, positive phase relationships indicate that NB is ahead of ZAK, while negative values indicate the opposite.

Average beat duration was calculated for every single cycle according to the accompanist’s mean IOI. In other words, the tabla player’s onset points were used to calculate average beat duration in sitar solos, and sitar data in tabla solos. The rationale for this is that the accompanist is normally in charge of providing a relatively stable metric framework for the soloist. Or, put differently, the accompanist tends to play in a more regular metric fashion than the soloist (as confirmed by the isochronization analysis), making his actions a more accurate indication of beat duration.

**Table 7** Sitar and Tabla mean isochronization, asynchronization, and entrainment values across the vilambit

<table>
<thead>
<tr>
<th>Vilambit</th>
<th>T. Solos</th>
<th>S. Solos</th>
<th>Mel.</th>
<th>Mel/Syl.</th>
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</tr>
<tr>
<td>Asynchronization (ms)</td>
<td>44</td>
<td>39</td>
<td>44</td>
<td>53</td>
<td>37</td>
<td>32</td>
</tr>
<tr>
<td>Mean Vector (μ)</td>
<td>-11.2°</td>
<td>-23.3°</td>
<td>-5°</td>
<td>-11.8°</td>
<td>-8.6°</td>
<td>-10.8°</td>
</tr>
<tr>
<td>Length M. Vector (r)</td>
<td>0.909</td>
<td>0.921</td>
<td>0.919</td>
<td>0.89</td>
<td>0.937</td>
<td>0.936</td>
</tr>
</tbody>
</table>

After calculating phase relationships for each pair of ‘quasi-simultaneous’ onsets, I used this data series to calculate both mean vector (μ) and length of mean vector (r) using Oriana 4.01 (2015) software. Both of these sets of results are shown below in Table 7, in Figure 13, and in Appendix A.
Apparent from these results is that NB plays consistently behind ZAK, as all mean vector values are negative. This can be clearly seen in the Figure 13, representing NB and ZAK’s entrainment data throughout the entire *vilambit*, in which the arrow’s angle describes their relative phase (-11.2°), and its length describes their strength of coupling (0.909).

![Figure 13](image)

*Figure 13 Interpersonal entrainment data for the entire vilambit performance by NB and ZAK*

These results reveal something which at first might seem paradoxical. The sitarist, who is normally considered the main artist and leader, is - in micro-temporal terms - significantly behind the tabla player throughout almost the entire *vilambit*, meaning that ZAK’s onsets tend to occur consistently before NB’s. How do we reconcile this fact with NB’s leading role? Doffman’s (2013) similar micro-temporal analysis based on a Jazz trio also found the soloist lagging significantly behind the rhythmic section. He argues that this makes the soloist more perceptually salient as it makes him stand out from the rhythm section by being a few milliseconds behind. Although this is a compelling idea, the results of the current analysis reveal a more complex situation.
Figure 14 Separate interpersonal entrainment data for tabla and sitar solos throughout vilambit performance by NB and ZAK

Although on the one hand NB plays consistently behind ZAK (a result which in itself supports Doffman’s conclusion), on the other hand there is a consistent tendency for whoever is playing the solo to be relatively ahead of the accompanist. Therefore, although mean vector values are always negative they tend to be smaller during sitar solos (-5°) and larger during tabla solos (-23.3°), implying that both performers may be enacting their roles as soloists at a micro-temporal level by playing relatively ahead (or in the case of NB, less behind) than the other performer (or conversely, performers may be enacting their roles as accompanists by lagging further behind).

Figure 14 above illustrates the marked difference in phase relationship according to soloist.

This tendency is notably consistent, as can be seen in Figure 15 below. Moreover, their phase relationship appears to be in no way affected by the sitarist’s rhythmic
approach or formal development, as NB is consistently behind ZAK by roughly the 
same angle throughout the *vilambit* (-11.8°, -8.6°, -10.8°, and -14.8°).

*Figure 15 Relative phase throughout the vilambit performance by NB and ZAK*

This presents a somewhat paradoxical relationship between performers’ musical role 
and their relative phase, in that the overall leader of the ensemble (NB) plays 
consistently behind, and yet whoever is taking the solo plays relatively ahead. One 
interpretation may be that during tabla solos ZAK is accelerating (as shown in Figure 
7, p. 110) while NB is accelerating slightly less, placing him a few milliseconds behind 
ZAK.

With regards to the strength of coupling results, these reveal very similar patterns to 
those from the asynchronization analysis, as they both describe essentially the same 
thing (i.e. how tightly performers’ coordinate their micro-temporal actions). Notice 
that Figure 16 describing NB and ZAK’s strength of coupling is very similar to Figure 
12 (p. 154) describing their asynchronization (although inverted due to differences in 
calculation). Thus, the various patterns apparent in Figure 16 (i.e. less coupled sitar 
solos during the opening melismatic section, less coupled tabla solos during the
closing *sawāl jawāb* section, and even levels of coupling during the middle syllabic section) can be accounted for by the same factors discussed in the asynchronization analysis above.

![Figure 16](image)

**Figure 16** Length of mean vector throughout the vilambit performance by NB and ZAK

However, one interesting difference worth noting is that the entrainment analysis reveals a greater decrease in coupling during the closing *sawāl jawāb* section compared to the asynchronization analysis. (The asynchronization values for the four main formal sections are 53, 37, 32 and 37 ms, while the strength of coupling values for these same four sections are 0.89, 0.937, 0.936, and 0.88). In other words, the main difference between the results obtained from each of these methods of micro-temporal analysis is that the increase in asynchronization during the *sawāl jawāb* section is relatively small, whereas the decrease in strength of coupling during this same section is more pronounced (actually becoming less coupled than the opening melismatic section). This means that while the *sawāl jawāb* section displays the lowest level of coupling of the entire performance, the concomitant increase in
tempo maintains performers’ asynchronization relatively low. Hence, this particular case reveals the value of combining both methods of analysis in order to obtain the most accurate picture of performers’ micro-temporal interactions.

4.5.5 Summary of Results and Conclusions for Micro-Temporal Analysis

Based on this analysis, I now summarize NB and ZAK’s micro-temporal interactions throughout this vilambit performance and draw some wider conclusions based on these results.

- There is a close relationship between performers’ alternating musical role and their isochronization, in that both performers’ isochronization values tend to increase when they act as soloists and decrease when acting as accompanist. This pattern is more pronounced for NB during the opening melismatic section, and more pronounced for ZAK during the closing syllabic section.

- ZAK displays higher mean isochronous values for the entire performance. This pattern becomes firmly established once NB starts playing more syllabically from S5 onwards.

- Sitar solos are less synchronized and coupled than tabla solos during the opening melismatic section, while tabla solos become less synchronized and coupled during the remaining syllabic part (especially during the sawāl jawāb section).

- NB plays consistently behind ZAK throughout the vilambit. Their phase relationship is not significantly affected by changes in surface rhythm nor formal development, but is clearly affected by their alternation of musical
roles, with whoever is the soloist playing ahead of the accompanist (or in the case of NB, less behind).

The first conclusion I propose to draw from this analysis is that even highly skilful performers play with a fairly noticeable lack of synchronization. This, as I shall explain in the following chapter, may actually contribute to the music’s expressivity. As Rasch states, ‘the asynchronization of simultaneous tones should be regarded as one of the vital deviations in the performance of music’ (1988, p. 82), an idea which resonates with Keil’s (1994) theory of ‘participatory discrepancies’ described in Chapter One.

Secondly, performers’ micro-temporal interactions are neither random nor accidental. They show clear and consistent patterns according to formal and rhythmic processes. This could suggest that performers share a pre-reflective and bodily representation of appropriate micro-temporal interaction according to other musical parameters such as rhythm and form.

Thirdly, given that such micro-temporal interactions are tied to processes of rhythmic and formal development, one must be cautious in carrying out a comparative analysis (such as the one I will be carrying out in the following chapter) and take into account performers’ concomitant formal and rhythmic interactions.
4.6 Summary of Relational Analysis

Based on the results of the formal, rhythmic, and micro-temporal analyses, we may now describe NB and ZAK’s performance during the vilambit section of rāg Sindhu Khamāj as follows:

Beginning with a brief overview, this vilambit performance consists of ten sitar and ten tabla solos with an average duration of 2’20” and 52” respectively, in addition to a closing sawāl jawāb-like section in which performers take turns carrying out one-cycle-long solos for a total of seven cycles. NB approaches a major portion of his solos in a melismatic, ālāp-like manner which, together with this performance’s formal outline, may imply a vocal Khyāl model.

Performers’ formal interactions are likely governed by a tacitly-shared formal representation which consists of the sitarist’s solos being roughly three times as long as the tabla player’s. Since this performance’s syntagmatic structure is similar to those of the case study, one may conclude that NB’s higher musical status did not affect ZAK’s playing in this respect, nor did NB try to enact his superior status by taking exceedingly long solos and allowing little time for ZAK to display his own skills.

This vilambit performance is characterized by relatively low levels of rhythmic interaction between performers. While ZAK finishes every one of his solos with a tihāi, NB only reacts overtly to these final cadences about half of the times. Similarly, NB plays clear cadential patterns (i.e. tihāis and mukhrās) relatively frequently during his solos, but these rarely cause a clear response from ZAK. In addition to these cadential passages, there are only a few other instances in which performers interact
overtly. However, there is a noticeable change towards the very end of the vilambit, firstly, during NB’s last solo (S10) where ZAK synchronizes with several of NB’s rhythmic actions, and secondly, during the sawāl jawāb section, which is inherently interactive. I propose that these low levels of rhythmic interaction are probably deliberate and due to a combination of factors such as NB’s characteristically introspective style and a possible Khyāl model. Although less likely, it might also be due either to a lack of skill from ZAK or lack of attunement between performers.

NB and ZAK’s micro-temporal interactions are marked by the following patterns, which are fairly consistent throughout the vilambit: (i) NB plays consistently behind ZAK; (ii) relative phase, asynchronization, and isochronization showing a strong correlation with the performers’ alternating roles as soloist and accompanist; and (iii) tempo fluctuations suggesting that ZAK has a more significant influence that is normally ascribed to tabla players in this respect, particularly during his solos.

Overall, this analysis contributes to our understanding as to how sitar and tabla performers mutually shape each other’s possibilities of action, and how certain facets of a performance emerge in a non-centrally-directed manner from this dynamic process. In addition, it might help pin point certain aspects which distinguish highly skilful and accomplished performers, such as control over synchronization and tempo fluctuations.
4.7 Applying Relational Methods of Musical Analysis

How can we use these methods of musical analysis to infer sitar and tabla performers’ social experiences? First of all, it is important to understand that the various temporal levels of musical interaction addressed in this analysis naturally involve different levels of reflective awareness. On the one hand, micro-temporal interactions occur primarily below the threshold of conscious perception and agentive control, and are therefore characterized by little or no reflective understanding of the other’s intentions. In other words, it is extremely rare – maybe even impossible – for performers to consciously reflect on the other person’s intentions with regards to micro-temporal synchronization and relative phase. Consequently, we may assume that this level of musical interaction will only have an effect on performers’ social experiences at a pre-reflective, core level of consciousness. By finding out what kinds of micro-temporal interactions are more frequently associated with heightened feelings of musical connectivity, one may uncover certain facets of performers’ preferred state of shared subjectivity at a co-subjective level.

On the other hand, given the consistency with which sitar and tabla performers appear to determine the length of their solos on a 3:1 ratio, and the fact that doing so involves calculating large-scale temporal relationships, I propose that adhering to this syntagmatic structure involves relatively high degrees of conscious reflection. By this I do not mean that performers actually count the lengths of each other’s solos, but that they decide the length of their solos based on approximate calculations of their co-performer’s previous solo. This necessarily requires long-term memory and some level of reflective awareness. Therefore, I maintain that this level of musical
analysis will inform primarily as to intersubjective qualities of performers’ social experience.

Finally, I would argue that rhythmic interactions may involve varying levels of reflective and pre-reflective processes, according to the extent to which a certain action appears to be triggered by the co-performer’s concurrent action. I propose that certain kinds of rhythmic interactions – such as *tihāīs* and other cadential patterns, as well as *sawāl jawāb*-like passages – tend to involve high levels of understanding of the other’s musical intentions, whereas other kinds of rhythmic interactions – such as varying the *gat* or *ṭhekā* - do not require reflective intentional awareness. An analysis of sitar and tabla performers’ rhythmic interactions may therefore offer insight regarding both their co-subjective and intersubjective levels of social experience, according to the kinds of rhythmic interactions they engage in. Performances with high levels of reflective interactions may be assumed to involve extended levels of conscious awareness and foster heightened states of intersubjectivity, while performances which do not manifest frequent reflective interactions may be experienced in a co-subjective manner. Therefore, by identifying what kinds of rhythmic interactions are more or less likely to be associated with feelings of musical connectivity, we can deduce what kind of state of shared subjectivity do performers in this genre value the most (see Chapter Six).

Based on all of this, I now propose the following hypotheses regarding the formal, rhythmic, and micro-temporal interactions that I expect to be more conducive to heightened states of musical connectivity:
Firstly, I expect performers to feel more connected when their formal interactions are more egalitarian; in other words, when there is a smaller difference between sitar and tabla solos’ average duration. My assumption here is that an egalitarian syntagmatic structure represents a more interactive formal structure, in which the sitarist does not emphasise his distinguishing role as main artist, and in which the tabla player is given greater chances to display his own musical talents.

Secondly, I expect performers experiencing high levels of connectivity to display frequent and overt forms of rhythmic interaction, resulting in heightened states of intersubjectivity. My assumption behind this hypothesis is that communicating each other’s musical intentions may promote a sense of empathic attunement, and that performers may find complex forms of musical coordination intrinsically rewarding.

Thirdly, I expect connected performers to interact at a micro-temporal level in a comparatively more synchronized manner. My assumption here is that high levels of synchronization result in an embodied and sonic sense of cohesion which naturally promotes feelings of social unity.

In addition, I also expect musical interactions that involve reflective awareness (i.e. formal and rhythmic ones) to be more influenced by factors of social status such as role and seniority. This hypothesis originates in the assumption that performers are not capable of being reflectively aware of interactions occurring at a micro-temporal level, and hence it is less likely that these interactions will be influenced by social narratives.
Chapter Five – A Collaborative Study on the Relationship between Musical Interaction and Social Experience

5.1 Introduction

The two previous chapters addressed the topic of musical connectivity from a behavioural perspective; that is, by focusing on the various actions and interactions that constitute a typical sitar and tabla performance, while largely avoiding questions regarding the social experiences permeating these joint actions. I now propose to explore the relationship between sitar and tabla performers’ contextualized musical interactions and their concomitant feelings of musical connectivity by investigating whether - out of the wide range of possible musical actions involved in this genre - there are any specific kinds of behaviours which are regularly associated with either positive or negative social feelings.

The content of this chapter is based on a collaborative case study carried out in the North Indian city of Varanasi, through which I was able to collect a wide range of ethnographic and empirical data regarding sitar and tabla performers’ musical interactions and underlying experiences, within contexts of ecological validity. I begin this chapter by describing the case study’s aims and design, and by providing an overview of the results obtained. I then contextualize these results by drawing attention at the way that musical status and familiarity affected performers’ interactions and connectivity reports. I also reflect on some of the implications regarding performers’ self-reported connectivity ratings, and discuss the possible
reasons why certain moments were identified as instances of either high or low connectivity. Lastly, I apply the relational methods of musical analysis developed in Chapter Four in order to test the various hypotheses regarding the relationship between sitar and tabla performers’ self-reported feelings of connectivity and their formal, rhythmic, and micro-temporal interactions.

Overall, the purpose of this chapter is to attempt to uncover regular patterns in this behavioural/experiential relationship, firstly, to gain a better understanding of how sitar and tabla performers bring forth positive social experiences through joint music making, and secondly, to find out what it feels like to connect in this genre. By identifying and contextualizing the kinds of musical interactions recurrently underlying experiences of heightened musical connectivity, and by considering the level of reflective awareness involved in these interactions, we can further develop ideas about how these interactions affect performers’ social experiences according to various levels of shared subjectivity described in Chapter One. Thus, the insight gained throughout this Chapter will form the basis for a phenomenological analysis of musical connectivity in sitar and tabla performance, reported in Chapter Six.

5.2 Case Study Methodology and Overview

The aim of this case study was to explore the relationship between sitar and tabla performers’ contextualized musical interactions, their varied social relationships, and their self-reported feelings of musical connectivity. In this section I present the rationale for my collection, handling, and description of these data.
The study was carried out in the North Indian city of Varanasi, and involved close collaboration with expert informants Shyam Rastogi (sitar player) and Sandeep Rao (tabla player), two professional musicians, who are also cousins of the same age, who grew up in the same house, who have been playing music together since childhood, and who perform together on a weekly basis, all of which made them ideal collaborators for a research on musical connectivity (see Chapter Two, section 2.5). In addition, the study also included the participation of five other professional musicians from the same city.

Although Hindustānī performers may often have a main duo partner – someone with whom they play and practice on a regular basis, such as the case of Shyam and Sandeep, or the famous example of Pt. Ravi Shankar and Us. Alla Rakha - professional musicians often perform with less familiar, sometimes even completely unknown, partners. The case study capitalized on this situation by comparing Shyam and Sandeep’s performances together and with different musicians, thereby exploring the effect that musical familiarity, relative social status, and affection had on performers’ musical interactions and concomitant feelings of sociality.

The study was comprised of nine live performances, with the following ensemble configurations:

- Shyam and Sandeep playing together x 3
- Shyam playing with other tabla players x 3
- Sandeep playing with other sitar players x 3
This design provided different dyads of varying degrees of musical familiarity and status relationship, which formed the basis for subsequent comparative analysis. Throughout this study, I made no requests as to the choice of rāg, tāl, formal outline, or duration, in order not to interfere with the performers’ natural musical behaviour and possible connectivity. I also allowed Shyam and Sandeep to select the other performers taking part in this study, for the same reasons.

Every performer taking part was informed about the nature of this research prior to their performance, and were asked to sign a form stating their permission for me to use these recordings for the sole two purposes of (i) research and analysis, and (ii) non-profit dissemination of short excerpts. Performers were compensated for their participation and provided with my contact details giving them to withdraw consent at any point. Nevertheless, with the exception of Shyam and Sandeep, all other performers’ anonymity is preserved. The reason for referring to Shyam and Sandeep by name while keeping all other musicians anonymous was due to the sensitive nature of this research, which impinged on matters of musical capability and status, and which was felt could potentially have an impact on the performers’ sensibility, relationships, and reputation. Since Shyam and Sandeep openly expressed their enthusiasm in participating in this project and being recognized for it, I decided to keep their names but exclude all others. Therefore, while I shall refer to Shyam and Sandeep either by name or initials throughout this chapter, I will refer to the other performers as sitar player one (SP1), tabla player one (TP1), and so forth. I should also point out that we were unable to recruit a third tabla player to take part in this case study, which is why Shyam was accompanied by TP1 twice.
Every performance took place at the International Music Centre Ashram in front of a live audience. Performances were recorded with a Zoom H4 handy recorder connected to two contact microphones, which were placed on the sitar and tabla. This method provided both a stereo recording of both performers used for musical analysis, and a mono recording of each performer on a separate track in order to extract precise onset timing data for micro-temporal analysis. Performances were also filmed with a steady camera capturing both performers’ actions on stage. These recordings were used for the purpose of musical description and analysis, as well as for video recall during one of my interviews with Shyam and Sandeep. In addition, these videos were also helpful in allowing me to identify specific moments of high or low connectivity reported by musicians verbally following each performance. Upon the musicians’ request, lights were kept relatively low during the performances. Although this compromised the quality of these video recordings, I nevertheless judged it more important to allow musicians to perform in their preferred setting, so as avoid inhibiting their connectivity as much as possible (see section 2.6).

Musicians were interviewed immediately after each performance on their varied personal and social experiences, and on what they considered to be the main factors affecting their experiences. Interviews often began with a general overview of my research interests, stressing that my main concern consisted in finding out about how they felt during the performance, rather than any objective musical matter. Musicians were then asked the following standardized questions, which often led to more extended discussions:
1. How often do you perform and/or practice together?
2. From 1 to 5 (1 being very low, 5 being very high, and 3 being normal), how connected would you say you felt during today’s performance, and why?
3. Which moment or moments did you feel the most connected, and why?
4. Was there any moment you felt disconnected, and if so, why?

These interviews were subsequently transcribed and analysed by extracting themes pertaining to (i) mental and affective processes underlining musical interaction, (ii) recurrent factors promoting or inhibiting musical connectivity, (iii) phenomenological descriptions of the performers varied experiences of connectivity. The rich ethnographic data collected by means of these nine interviews was then used, on the one hand, to account for the performers’ reported relationships between various kinds of musical interactions, social relationships, and feelings of connectivity, and on the other hand, to explore what it feels like for performers to connect in this particular genre (see Chapter Six).

In addition to the relatively brief interviews carried out immediately after each performance, I also carried out a more extensive interview with Shyam and Sandeep the day after their first performance of rāg Darbārī (see Table 8, p. 177). During this interview, we used video recall to discuss various aspects of their performance and identify specific moments of high or low connectivity in more detail. Although this method proved both useful and insightful, it was nevertheless the last time we used video recall. The reason was that both Shyam and Sandeep expressed their dislike towards watching themselves play, and I realized that forcing them to do so on a regular basis could make them feel more self-conscious and thereby inhibit their natural behaviour and possible connectivity. Moreover, I also realized that reporting
on moments of high and low connectivity immediately after each performance, and without video recall, could in some ways be considered more accurate, in that it avoids being mediated by a third-person perspective.

Overall, this methodology allowed me to collect a wide range of both empirical and ethnographic data pertaining to sitar and tabla performers’ musical interactions and underlying experiences, and from contexts of ecological validity. These data included:

1. Low-quality video recordings of nine live sitar and tabla performances, for musical description and analysis.
2. High-quality audio recordings, including both stereo recordings and mono recordings with each performer on a separate track, for musical and micro-temporal analysis.
3. A quantifiable and comparative measure of performers’ varied experiences of musical connectivity.
4. Identification of high and low moments of musical connectivity from the performers’ first-person perspective.
5. Rich qualitative data regarding social, phenomenological, and behavioural aspects of musical connectivity in this genre.

In the following two sections I provide an overview of these nine performances’ formal structure, musical connectivity reports, and performers’ varied social relationships. This information will form the basis for subsequent analyses on the relationship between performers’ contextualized musical interactions and their self-reported connectivity.
5.3 Overview of Performance Structure and Collected Data

All nine performances began with an extended sitar solo (*anibaddh*) section, normally involving a complete *ālāp-jor-jhālā* performance, followed by a duo (*nibaddh*) section of roughly equal length (see Chapter Three, section 3.3). The mean duration for the duo sections was just over 32 minutes. Every performance consisted of two *gat* sections culminating in a *jhālā* section, as is most often the case.

Five of the first *gat* sections were in *vilambit tīntāl* (i.e. slow speed, 16-beat cycle) and four were in *madhya jhaptāl* (i.e. medium speed, 10-beat cycle). All of the second *gat* sections were in *tīntāl*, normally starting in *madhya lay* and accelerating to *drut lay*. The mean durational ratio for each of these three sections was 56:26:18% (see Figure 17 below). It is worth pointing out that the choice of *tāl* and *lay* had no significant effect on the first *gat* section’s relative duration, which was 55% for *jhaptāl* and 56% for *tīntāl*.

![Figure 17 Mean relative durations for case study’s nine performances’ formal sections.](image)

On average, first *gat* sections consisted of four sitar and four tabla solos, whereas second *gat* sections consisted of approximately three solos per performer. As usual, sitar solos were significantly longer than tabla solos, resulting in an overall ratio of 74:26%. This calculation does not take into account the *jhālā* section, where – as
explained in Chapter Three - performers do not usually take turns carrying solos as
they do during gat sections. More information on the duration and formal outline of
each performance can be found in Table 9 (p. 199).

**Table 8** Case study data overview, including performers’ self-reported connectivity ratings,
and moments of high and low connectivity.

<table>
<thead>
<tr>
<th>Ensemble</th>
<th>Rāg</th>
<th>Date &amp; Order</th>
<th>Familiarity</th>
<th>Connectivity Rating</th>
<th>High Con. Moment</th>
<th>Low Con. Moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH &amp; SD</td>
<td>Yaman</td>
<td>11/01/14 2</td>
<td>Very High</td>
<td>3.5</td>
<td>Laykārī in Madhya</td>
<td>-</td>
</tr>
<tr>
<td>SH &amp; SD</td>
<td>Darbārī</td>
<td>09/01/14 1</td>
<td>Very High</td>
<td>3</td>
<td>Beginning of Vilambit (S2)</td>
<td>Beginning of Madhya</td>
</tr>
<tr>
<td>SH &amp; SD</td>
<td>P. Kalyān</td>
<td>18/01/14 3</td>
<td>Very High</td>
<td>3</td>
<td>Beginning of Vilambit</td>
<td>Jhālā</td>
</tr>
<tr>
<td>SH &amp; TP1</td>
<td>Bāgeśrī</td>
<td>22/01/14 4</td>
<td>Medium</td>
<td>4</td>
<td>Laykārī in jhaptāl</td>
<td>-</td>
</tr>
<tr>
<td>SH &amp; TP1</td>
<td>Jhiṇjhoṭī</td>
<td>01/02/14 8</td>
<td>Medium</td>
<td>4</td>
<td>Laykārī in jhaptāl</td>
<td>Jhālā</td>
</tr>
<tr>
<td>SH &amp; TP2</td>
<td>Bāgeśrī</td>
<td>08/02/14 9</td>
<td>Low</td>
<td>3</td>
<td>Beginning of Madhya</td>
<td>Many brief places</td>
</tr>
<tr>
<td>SP1 &amp; SD</td>
<td>Pūriyā</td>
<td>25/01/14 5</td>
<td>Medium</td>
<td>3.5</td>
<td>Beginning of Madhya/Drut</td>
<td>Beginning of Vilambit</td>
</tr>
<tr>
<td>SP2 &amp; SD</td>
<td>Yaman</td>
<td>30/01/14 7</td>
<td>Low</td>
<td>3</td>
<td>Jhālā</td>
<td>1st and 2ndTabla Solo</td>
</tr>
<tr>
<td>SP3 &amp; SD</td>
<td>Jhiṇjhoṭī</td>
<td>29/01/14 6</td>
<td>Low</td>
<td>2.5</td>
<td>Beginning of Vilambit</td>
<td>Most of Drut and Jhālā</td>
</tr>
</tbody>
</table>

Table 8 presents an overview of data collected through this case study, including
ensemble configuration, choice of rāg, date and sequential order, musical familiarity,
connectivity ratings, and specific moments identified as displaying the highest and
lowest levels of connection.

Levels of familiarity were determined according to how often performers performed
together, as reported in the interviews following each performance. Performers with
very high levels of familiarity (which only Shyam and Sandeep shared) played
together at least once a week; those with medium levels of familiarity played
together approximately once a month; and those with low levels of familiarity played
together only a few times a year.

The table is arranged, firstly, according to ensemble configuration (with Shyam and
Sandeep in the first group, Shyam and other tabla players in the second group, and
Sandeep and other sitarists in the third one), and secondly, according to connectivity
ratings from high to low within each of the three subgroups. This arrangement is
meant to facilitate comparative analysis, and will therefore be maintained
throughout this chapter. Also, I will henceforth refer to each performance according
to rāg and ensemble configuration; for example rāg Darbārī by Shyam and Sandeep,
or rāg Bāgeśrī by Shyam and TP1.

5.4 Social Relationships

In this section I report on the varying social relationships and levels of musical
familiarity among the various performers taking part in this study in order to situate
the subsequent discussions and analyses within a more nuanced social context. First
of all, Shyam and Sandeep had - by far - the most experience performing and
practicing together. Out of the other ensemble configurations, both Shyam and TP1,
and Sandeep and SP1, performed together approximately once a month, whereas the
remaining performers (TP2, SP2, and SP3) only performed with Shyam or Sandeep
approximately once a year.
In addition to their varying levels of familiarity, social relationships among performers were also marked by their relative social status. Whereas, as I explain in Chapter Three, the norm is for sitarists to occupy a higher status than tabla players and thereby assume a leading role while performing, the difference in status between performers can be magnified, reduced, or occasionally inverted according to various factors (see Clayton & Leante, 2015). One of the main factors affecting performers’ relative status is musical skill and performing ability, which is often linked to public recognition. An upcoming artist is likely to assume a more respectful and submissive role when playing with an established artist, even if the upcoming artist is the soloist and the established artist the accompanist.

Another important factor is age or seniority. Senior performers are likely to assume a leading role, and may, in addition, expect an attitude of deference from their younger musical partners. As Clayton and Leante point out, ‘contradictions between the hierarchies of musical role and seniority are, in short, often the simplest explanation for conflict between musicians’ (2015, p. 428). It is therefore worth taking a close look at the status relationship between musicians taking part in this cases study, and considering how this affected their musical interactions and connectivity.

Being cousins of the same age and having played music for roughly the same amount of time, Shyam and Sandeep represented a highly egalitarian, and therefore slightly unusual, situation. Although as a sitarist Shyam was officially the lead, and did in fact make most musical decisions, I also often witnessed Sandeep assuming a leading role,
normally either by asking Shyam to increase tempo, move on to the next section, or by taking a tabla solo without Shyam’s explicit permission. None of the other ensemble configurations showed the same degree of flexibility in this regard.

Out of the two other tabla players accompanying Shyam, TP1 was considered to be of roughly the same status as Shyam, since they were of the same age and had roughly similar musical skills. On the other hand, although TP2 was also about the same age as Shyam, he was considered one of the best young tabla players in Varanasi, and was often sought be senior established artists as an accompanist. It seemed to me that this placed him at a slightly higher musical status than Shyam, which as I shall show shortly, was reflected in their musical interactions.

The most interesting differences in status were among Sandeep’s three performances with other sitarists, each of which presented a unique scenario. Firstly, SP1 was about ten years younger than Sandeep, which therefore allowed Sandeep to assume a more patronizing and slightly dominant attitude, for example, by often referring to him as ‘boy’. Conversely, SP2 was about twenty years older than Sandeep, who in this case assumed a much more submissive role. As SP2 explicitly stated:

Sandeep is very young and he plays very nice...his behaviour also nice, this is first [sic]. If the accompanist behaviour is ok, then everything is ok... Like, he give honour [sic]. I am very old now, fifty years. He is maybe twenty-five years younger... This is very important, I am main artist, and the accompanist should not be above me, he should be under me.
In this quote, SP2 makes explicit a perception that his role as main artist combined with his seniority bestow him a higher status than Sandeep. This, I argue throughout this chapter, appeared to influence their musical interactions and social experiences.

Lastly, whilst SP3 was roughly the same age and had roughly the same performing ability as Sandeep, she was a woman (the only woman participating in this case study). This raises the interesting question as to whether gender has an impact on either musical status or musical behaviour. Although Clayton and Leante (2015) are inclined to deny this being the case, and Sandeep made no explicit reference to SP3’s gender at any point, he did complain about the ‘softness’ in her playing, which may be interpreted in reference to her gender. Furthermore, although gender might not have an effect on musical status, it is nevertheless possible it has an effect on connectivity, as there may be boundaries to the public expression and enactment of social bonding between men and women. Having said so, and although the performance with SP3 happened to receive the lowest connectivity rating, I do not think gender was the main cause of this, as I shall demonstrate shortly.

5.5 Discussion on Performers’ Self-Reported Connectivity

In the following sections I discuss and interpret the implications regarding performers’ self-reported connectivity ratings, both throughout entire performances (section 5.5.1) and with regards to specific moments identified as exhibiting particularly high or low connectivity (sections 5.5.2 and 5.5.3).
5.5.1 Connectivity Ratings and their Implications

In this section I discuss some of the implications regarding the process by which performers rated their levels of connectivity, and the results thereby obtained. I would like to begin this discussion by noting that the range of connectivity ratings throughout this case study was relatively narrow (from 2.5 to 4). Most performances were rated either as average or just above average, with only one performance rated below average. In none of the performances did musicians rate their musical experiences as either very high or very low. How should we interpret these results?

On the one hand, I would argue that as evidence that heightened musical connectivity is a fairly rare occurrence, hence its value. According to Sandeep, highly connected performances only happen a few times a year, out of an average of two performances per week. It is therefore hardly surprising that this did not occur over a relatively small sample of performances, especially considering my presence as a researcher analysing their musical behaviours and experiences (more on this below).

On the other hand, the lack of low connectivity ratings may be partly explained by the fact that all performers were professionals, which made them capable of maintaining musical cohesion at all times, and therefore experiencing at least average levels of connectivity. Moreover, Shyam and Sandeep were allowed to choose whom to perform with, and they understandably avoided performing with anyone with whom they had either a bad or no relationship whatsoever. However, I would also argue that another reason why only a single performance was rated slightly below average is because performers were unwilling to give low connectivity
ratings so as not to offend their partner or diminish their own skills, and ultimately, to avoid social conflict.

I was particularly surprised by two performances in which I expected Sandeep to rate his connectivity as 2, and yet he gave a 3. One of these performances was with the senior sitarist SP2, in which Sandeep was consistently challenged musically through subtle changes in tempo and sudden, marked contrasts in rhythm and dynamics - all of which required Sandeep to assume a more submissive role. Although Sandeep privately complained about this, thereby revealing slight feelings of animosity, he nevertheless rated his connectivity as 3. When I asked him why did he rate his connectivity in the same way as he did a few days earlier while playing with Shyam in a much more egalitarian and unrestrained situation, he said it was because he appreciated the challenge imposed by SP2, as it encouraged him to grow as a musician. It seems unlikely that Sandeep would have been as accepting of such a behaviour from his musical partner had there not been a significant age difference between the two, thus suggesting that performers’ expectations may vary according to their relative status, and that this in turn may affect the relationship between performers’ musical interactions and feelings of connectivity.

The second instance in which I was surprised by Sandeep’s connectivity rating was after the performance of राग ज़ीष्णोति with SP3. Here, I noticed a palpable tension between the two, which was later confirmed by SP3, who rated their connectivity (in private) as 2. She explained that the reasons she felt this way were because she had been informed at the last minute about my research and felt lacking in practice, all of
which made her feel uncomfortable and slightly unsatisfied about her performance.

When I then asked Sandeep about his experience during this performance, he replied the following:

Today I don’t feel lots of connection, maybe 3... she is very soft and also not responding that much when I am playing something. You remember when I was playing with this boy [SP1], even though we don’t play together a lot, he was responding, so it makes me more joyful. So I was feeling more connected with him. With Shyam I always feel very connected because I play with him a lot, I don’t need to think anything, just play and enjoy. But with the boy I felt very connected because he was supporting me also... She [SP3] also said that she had not practiced very well during the last week, that’s also possible. That’s the most important factor. But I also haven’t practiced in the last two or three days because I had to be putting posters and giving flyers - we have to work for the ashram also - but I don’t feel tonight I am not in good practice. Today that was not a factor. Today I feel the problem was she was not responding.

One way of interpreting this statement is that Sandeep’s rating of this performance was not entirely representative of what he actually experienced, and is more likely a way of avoiding social conflict with SP3. His real feelings appear to be expressed, firstly, in comparison with the previous performance with SP1 and with most performances with Shyam, and secondly, by complaining that SP3 was very soft and not responding. This issue highlights that although connectivity ratings are useful in giving a simple numerical value to the performers’ social experiences, this value should be interpreted in context and in light of the more nuanced ethnographic data collected through interviews.

This raises another interesting issue, which is that performers did not always agree on how connected they felt. In addition to the performance with SP3, the same thing happened in Sandeep’s performance with SP1 (in which Sandeep rated his
connectivity as 4 and SP1 as 3) and with Shyam (in which Sandeep rated his connectivity as 3 and Shyam as 4). Whereas in the case of SP3 and Sandeep – discussed in the previous paragraphs - I would argue that the discrepancy in connectivity ratings was mainly the result of Sandeep avoiding social conflict (meaning that there might not actually have been much discrepancy between the two), it seems to me that the discrepancies in the other two performances were real. Based on the more nuanced verbal descriptions following these performances, my own impression is that Sandeep did in fact feel more connected than SP1 in the performance of rāg Pūriyā, and that Shyam did feel more connected than Sandeep in the performance of rāg Yaman. The question is why? Why, if the success of a performance depends on performers’ joint actions, would one performer feel more connected than the other?

I would propose that in these two cases this discrepancy is due to the relationship between each performer’s personal expectations and his or her personal output. In the case of SP1 and Sandeep’s performance of rāg Pūriyā, they both explicitly referred to their personal expectations in relation to their technical capacity as the cause of their discrepancies in connectivity. On the one hand, SP1 stated he gave 3 because ‘I can give a better performance’, while on the other hand Sandeep stated he gave 4 because ‘for the last week I’ve been trying to practice more...when you practice more you can enjoy more’. In addition, it is also likely that Sandeep felt more connected because of his higher relative status, and because of what Sandeep recognized in SP1 as a highly interactive style of playing (see p. 184).
In the case of Shyam and Sandeep’s performance of rāg Yaman, Shyam’s higher connectivity rating may have been a result of his personal comparison with their previous performance of rāg Darbārī just a few days earlier. Shyam described Darbārī as a difficult rāg which he rarely played, whereas he felt very confident playing and improvising on Yaman (which is the first rāg sitarists normally start learning). Shyam’s higher connectivity rating for the performance of rāg Yaman may have resulted from a feeling of ease of playing a familiar and less challenging rāg, in comparison to his last performance. This did not apply to Sandeep, who therefore rated his connectivity as average.

One last issue worth discussing at this point is the rather surprising result that Shyam and Sandeep’s very high level of musical familiarity and affection did not seem to have a significant effect on their connectivity ratings, which turned out to be of average values across the data set. In fact, performers with medium levels of familiarity ended up having the higher connectivity ratings. Does this mean that personal affection and musical familiarity have no effect on connectivity? I am inclined to reject this idea. Although there are several factors why Shyam and Sandeep might not have connected as much as Shyam and TP1 (which I will discuss throughout this chapter), it seems very likely that Shyam and Sandeep measure their own connectivity based on different parameters to when they play with other performers. In other words, the fact that they perform together so frequently makes it less likely for any single performance to stand out, which is possibly why a performance needs to be particularly outstanding for them to rate it as above average.
Overall, the conclusion I propose to draw from this discussion is that feelings of connectivity are fundamentally determined by the extent to which the events of a performance correspond to each performer’s personal expectations, with regards to his/her personal output, his/her co-performer’s output, and the overall sound of the ensemble. If a performance matches or exceeds a performer’s expectations, then he or she is likely to feel connected with his/her duo partner; and if they do not, then he or she is likely to feel disconnected. However, the duo partner may have different expectations, which may cause him or her to experience different levels of connectivity. Moreover, these expectations are in turn determined by numerous variables, such as relative social status and musical familiarity, which therefore need to be taken into account while exploring the relationship between musical interaction and social experience.

One of the main questions I explore throughout the remainder of this chapter is whether certain expectations were generally maintained throughout these nine performances. If this were so, we could then argue that these expectation might constitute a defining quality of what sitar and tabla performers are likely to deem as ideal musical experiences of sociality.

5.5.2 Low Connectivity Moments

In this section, I focus on musical passages identified by these performers as displaying low levels of connectivity, and try to uncover the causes underlying these negative social experiences. As we shall see, the most important variable regarding
these disconnected moments was whether they were intentional or not; in other words, whether they were caused by unintentional mistakes or caused intentionally by one of the performers. Whereas unintentional mistakes point to the high technical demands imposed by this genre, intentional moments of disconnection point to social tensions that may underlie Hindustānī performance, as well as ethnomusicological research (as we shall see).

Overall, the most common reason for a specific moment to be experienced as disconnected throughout this study was due to technical mistakes. For example, in both the performance of rāg P. Kalyāņ by Shyam and Sandeep, and of rāg Jhījhoṭī by Shyam and TP1, the jhālā section was identified as the moment of lowest connectivity. In both cases, Shyam admitted that, being slightly out of practice, he ended up feeling quite tired by the time he reached the jhālā section and struggled to maintain high speed and technical precision, thereby resulting in mistakes and feelings of discomfort.

Another common cause of disconnection throughout this case study was misunderstanding between performers with regards to tāl. This happened both at the beginning of the madhya section in the performance of rāg Darbārī by Shyam and Sandeep, and in the beginning of the vilambit in the performance of rāg Pūriyā by SP1 and Sandeep. Similarly, both Shyam and TP2 felt there were several moments throughout their performance of Bāgeśrī in which they encountered brief technical problems, such as not getting a tihāī to work just right, not being able to attain a desired speed, or instruments going out of tune. As TP2 admitted, ‘sometimes my
tihāśīs are mistaken, then at that time I feel very bad'. The accumulated effect of such brief technical problems was enough to disturb the flow of the performance, which in turn appeared to disrupt their connectivity. Together, these various examples highlight the enormous stress placed upon precise coordination and technical capacity, and how - as performers continuously remarked - these may feel to deteriorate significantly even after a few days without proper riyaz (i.e. practice).

While all of the disconnected moments referred to so far share the characteristic of being accidental, the two I shall discuss next were not. In the case of SP2 and Sandeep’s performance of rāg Yaman, Sandeep complained that SP2 purposefully raised the tempo whenever it was his turn for a tabla solo. This not only made Sandeep’s job more challenging, but also provoked some negative feelings, since Sandeep perceived SP2 as consciously trying to either sabotage or at least create unnecessary complications for his performance. However, as I already noted, Sandeep ultimately said he welcomed the challenge as a means for musical growth.

The other case in which disconnection seemed to have been somewhat intentional was during SP3 and Sandeep’s performance of rāg Jhiĩjhoṭī, where SP3 gave Sandeep no chance to play a tabla solo throughout the second gat section, and was generally non-interactive throughout this section and the closing jhālā. As already mentioned, it is likely that SP3 adopted this behaviour because of her dissatisfaction with the way in which she was informed about my research combined with her current lack of practice, and therefore chose this way to express her disapproval and discomfort with the situation.
Sandeep’s performance with SP3 demonstrates how a researcher’s presence may interfere with performers’ musical interactions and feelings of connectivity, even when purposefully striving to interfere as little as possible. This same sentiment was expressed by Sandeep towards the end of this study, when he admitted that:

Due to your recording I am totally depressed, because whenever I play with Shyam I feel I should play something new for you, but it is very difficult.

This statement summarizes several of the issues discussed so far. Firstly, it reveals how demanding and challenging North Indian music can be, even for a professional performer. Secondly, it shows how feelings of connectivity are intrinsically tied to performers’ personal expectations, and moreover, how these expectations had a particularly strong effect on Shyam and Sandeep’s joint performances (which in turn helps explain why their connectivity ratings were not above average). Thirdly, it also reveals the inevitable effect a researcher’s presence may have on performers’ musical behaviours and experiences. All of this evidence suggests that - as I shall argue more extensively in Chapter Six - musical connectivity seems to be intrinsically tied to how it makes performers feel about their own selves, and not just about their relation to others.

5.5.3 High Connectivity Moments

In this next section, I focus on moments identified as displaying high levels of connectivity. As one can see in Table 8 (p. 177), certain passages were recurrently identified as manifesting high connectivity, which suggests that something about these interactions might promote connectivity among sitar and tabla performers in a rather consistent manner. This finding may in turn be used to gain information
regarding what kinds of social experiences do these performers value most, as I shall do in the following chapter.

The kind of musical passages most frequently identified as manifesting high connectivity among these performers were *laykārī* sections, which - as I explained in Chapter Three (section 3.8) - are defined by high levels of syncopation. Given that performers identified *laykārī* sections as the most highly connected passage in three out of nine performances (*rāg Yaman*, by Shyam and Sandeep; and both *rāg Bāgeśrī* and *rāg Jhiṅjhoṭī* by Shyam and TP1), we may deduce that syncopation might in some way help generate feelings of togetherness. As Shyam explicitly stated:

> These things [*laykārī*] always connect us, because then you have to see the rhythm, what is going on. You can say that in *laykārī* we are most connected.

At first, this might seem rather odd, since the high level of syncopation that characterizes *laykārī* sections means that the performers’ sounds are most disjointed, or in other words, less together. To clarify this, I propose to focus on the *laykārī* section of *rāg Jhiṅjhoṭī*, identified by Shyam and TP1 as displaying heightened connectivity, and included as Example 5 in the accompanying DVD. In this extract, TP1 plays the 10-beat *ṭhekā* for *jhaptāl* while Shyam simultaneously plays a 16-beat pattern (consisting of a note followed by three strokes on the *chikarī* strings). Shyam manages to fit this 16-beat pattern precisely within the 10 beat-underlying *tāl*, and eventually plays *tāns* which are underlined by a 16-beat metric framework but come to an end precisely on the 1st beat of the 10-beat *jhaptāl*. Example 5 includes numbers under each performer counting both the *tāl*’s 10 *mātrās* (underneath TP1) and the sitar’s 16-beat rhythm (underneath Shyam).
As one can hear and see in this example, performers’ sounds appear highly disjointed. And yet, crucially, both performers’ actions are underlined and regulated by the same metric framework. This means that both performers must double their effort in ensuring that attentional patterns remain precisely entrained. As we saw in Chapter One, having shared and coordinated patterns of attention is one of the fundamental ways in which music promotes feelings of social cohesion (see Hove & Risen, 2009; Kirschner & Tomasello, 2009). Thus, the increased attentional effort required during laykārī sections, combined with the mental and physical tension produced by this extreme form of syncopation, are probably the main reasons why these sections were frequently identified as moments of high connectivity.

Understanding interpersonal attentional entrainment as a predominantly pre-reflective form of social interaction, as per McGuiness and Overy (2011), performers need not be aware of each other’s intentions in order to remain entrained. Based both on my own experience and on professional performers’ reports, I suspect that in laykārī sections there normally is a certain degree of shared reflective understanding regarding the soloist’s intended approach to syncopation. However, this is neither crucial nor sufficient for performers to maintain cohesion. For instance, in the example just discussed, I suspect that TP1 was aware of Shyam’s intention of playing a 16-beat rhythmic cycle over a 10-beat tal. However, once this pattern is identified, it no longer requires any further reflection from TP1. Rather, the way to maintain coordination in this kind of passage is by keeping a steady beat and not allowing syncopation to disrupt it. Hence, I propose that laykārī sections promote musical connectivity at a primarily co-subjective level of experience.
Another kind of musical passage which was also identified as displaying high levels of connectivity on three separate occasions was the beginning of vilambit sections (in rāgs Darbārī and P. Kalyāṇ by Shyam and Sandeep, and rāg Jhiṅjhoṭī by SP3 and Sandeep). I would argue that the main reason for this is related to this section’s slow underlining tempo. Vilambit is often considered to be the most introspective and expressive section of the duo performance, since the slow tempo allows the soloist to focus on melody and develop the rāg’s particular mood or character. Consequently, vilambit is arguably the section of the duo performance in which performers are most likely to experience a sense empathic attunement centred on the rāg’s melodic character (see sections 1.3.1, 3.4, and 6.5.3). As tabla player Keshava Rao Nayak humorously explained: ‘ālāp is the head, vilambit is the heart, madhya is the stomach, and ķhālā is the legs’.

In order to clarify this point, I now focus on Example 6, which consists of the second sitar solo of the performance of rāg Darbārī by Shyam and Sandeep, and which was identified through video recall as being the moment of highest connectivity throughout this performance. According to Sandeep, the main point of connection in this performance, and especially during the early stages of the vilambit, was the ‘melody’ (presumably meaning not only the gat, but the rāg’s melodic character). Moreover, not only did Sandeep appreciate and therefore connect through the melody, but was also able to channel this appreciation back to Shyam, who explained:

Sam was on Dha [sixth note of scale], so in that sam I want the bass, the bayan [low sounding drum], to sound deep. This kind of thing I expect from the accompaniment. He [Sandeep] knows my mood, so
he can do it. Another accompanist might not do this and just give normal sam.

Another aspect worth pointing out regarding this particular solo is its interactive nature. First of all, Shyam plays a wide range of rhythmic material, ranging from melismatic ālāp-like phrases, to syncopated laykārī-like sections, and towards the end, some fast tāns. Shyam also often ends his solos either with a tihāī or mukhrā, and occasionally both. This presents Sandeep with the opportunity of responding to these cadential patterns with a tihāī, which he often does as well. In addition, it is also worth noticing that Sandeep often fills in the gaps left by Shyam immediately after each sam, by playing slightly more elaborate and rhythmically-dense material. Furthermore, there are a few moments in which Sandeep seems to interact with Shyam by either synchronizing or imitating him. All of this results in a musical passage which is both quite interactive and affectively charged.

Since, on the one hand, the process of emotional contagion caused by the rāg’s melodic character is predominantly pre-reflective, and on the other hand, the kinds of interactions displayed throughout this passage must involve a certain degree of reflective understanding, I propose that Shyam and Sandeep’s experiences of heightened connectivity in this passage are likely to involve both a co-subjective and an intersubjective quality. This is probably also the case in the other two vilambit passages reported as displaying high connectivity, which likewise display relatively high levels of overt musical interaction and expressive depth.

Moving on to another passage identified as highly connected, let us now focus on the jhālā section from the performance of rāg Yaman by SP2 and Sandeep. Based on my
own experience, I would argue that the main point of connectivity in jhālā consists of both performers playing at maximum speed, which creates a shared feeling of excitement and physical exertion. This feeling is reinforced by the sound produced by the tabla’s frequent Na strokes and the sitar’s chikarī strings, which together engulf the players in a loud and continuous drone-like sound. My impression is that, in this particular case, the jhālā section was reported as the moment of highest connectivity partly because it fit SP2’s energetic style of playing, and partly because of the interactive manner in which it was executed.

To illustrate this, I extracted a part of this jhālā (see Example 7) which is not only representative of what took place during the jhālā section, but in fact during most of the performance. Here we can see SP2 playfully trying to challenge Sandeep’s performing ability and possibly provoke a mistake. We also see Sandeep coping with this challenge with much effort, and yet appearing to enjoy it at the same time. As with the vilambit section discussed earlier, I interpret that this passage brought forth a combination of both co-subjective and intersubjective feelings, since their interactions are likely to have required a certain level of reflective understanding, while the jhālā’s underlying timbral and physical qualities must have affected the performers on a pre-reflective level of consciousness.

Regarding the remaining two moments of high connectivity, I must admit to not being able to understand exactly why they were chosen. In the case of rāg Bāgeśrī by Shyam and TP2, TP2 said he was unable to identify any single moment, while Shyam identified the beginning of second gat, and Sandeep, who was in the audience,
perceived it to by during the first gat. Bearing in mind that both Shyam and TP2 stated they made many small mistakes throughout the performance, I feel it is likely that no single moment stood out, hence the disagreement or vagueness as to the moment of highest connectivity.

I was more surprised by SP1 and Sandeep both agreeing on the beginning of the *madhya tīntāl* section as being the moment of highest connectivity, since as a listener I strongly felt their performance to be much better, and therefore presumably more connected, during the *vilambit* section. While the *vilambit* section was marked by a high level of rhythmic interaction (in the form of complex *tihāīs*, *mukhrās*, *laykāri*, and imitation), this does not seem to be the case during the *madhya*. Moreover, my impression is that the performance also seemed to lack some flow and coordination at this stage. Sandeep even referred specifically to a moment in which SP1 played some fast *tāns* and he responded, which I believe is the section I extracted for Example 8. While I can understand how this may result in connectivity, I feel there were many similar, yet for more effective, interactions during the *vilambit* section.

One last point worth discussing is that no tabla solo was chosen as a moment of high connectivity. This may appear somewhat perplexing, since tabla solos often receive more applause from the audience than sitar solos do (see Clayton, 2007a; Clayton & Leante, 2015), implying that audiences are more engaged at this stage. There are however several reasons why sitar solos might generate stronger feelings of connection among performers. Firstly, it is possible that since sitarists are considered the main artist, their solos (which are also longer) are perceived as encompassing the
essence of a performance, with tabla solos as ‘complementary’ rather than essential. Secondly, sitar solos often allow for more interaction between musicians, which may presumably foster greater connectivity. Thirdly, sitar solos are arguably capable of conveying deeper and more subtle kinds of emotions due to their melodic nature.

Overall, this discussion has aimed to foster a contextualization of the results obtained from this case study in preparation for the various empirical analyses that follow and identify some consistent patterns in the relationship between musical interaction and social experience in this genre. These include: (i) relative status as a fundamental factor shaping this relationship; (ii) positive social feelings being brought forth through syncopation, overt interaction, physical exertion, and melodic expression; and (iii) negative social feelings caused by social conflict or unintentional mistakes. Furthermore, we have also established probable levels of reflective awareness and understanding involved in these various musical interactions, in order to then use this insight to postulate certain phenomenological qualities regarding musical connectivity in this genre (see Chapter Six).

5.6 Relating Musical Interaction and Social Experience through Empirical Analysis

In the previous section, I explored some of the causes and implications behind these performers’ self-reported experiences of musical connectivity from a predominantly ethnographic perspective. In this section I will explore the relationship between certain kinds of musical interactions and feelings of high or low connectivity by
empirical means. Throughout this analysis, I will examine the three hypotheses posed at the end of the previous chapter. Namely, that musical connectivity in sitar and tabla performance is likely to be brought forth by:

- An egalitarian syntagmatic structure.
- High levels of rhythmic interaction.
- Highly synchronized and coupled micro-temporal interactions.

Any consistent relationship between certain kinds of musical interactions and experiences throughout these nine performances would make it possible to postulate certain qualities of experience that may be commonly valued by Indian performers, and that may therefore characterize heightened musical experience in this genre.

5.6.1 Analysis on the Relationship between Formal Interactions and Musical Connectivity

At the end of Chapter Four, I hypothesised that performances with higher levels of connectivity would have a more egalitarian syntagmatic ratio, or to put in simpler terms, that tabla solos would encompass a relatively larger proportion of the overall performance. My reasoning behind this hypothesis is that in connected performances, social distinctions regarding musical role (i.e. main artist and accompanist) and concomitant status would be undermined. In this hypothetical scenario, sitarists would be willing to give the tabla player more opportunities to carry out solos, and tabla players would be willing to develop their solos more extensively. I now investigate whether this hypothesis is supported by the empirical data collected in Varanasi.
### Table 9

Nine recorded performances’ syntagmatic values, including number of solos, solos’ average duration, and sitar and tabla solo proportions.

<table>
<thead>
<tr>
<th></th>
<th>First Gat Section</th>
<th>Second Gat Section</th>
<th>Total</th>
<th>Prop. (%)</th>
<th>Con. Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SH &amp; SD</strong></td>
<td>S 4</td>
<td>176</td>
<td>69</td>
<td>3</td>
<td>130</td>
</tr>
<tr>
<td><strong>Yaman</strong></td>
<td>T 5</td>
<td>64</td>
<td>31</td>
<td>2</td>
<td>65</td>
</tr>
<tr>
<td><strong>SH &amp; SD</strong></td>
<td>S 3</td>
<td>268</td>
<td>71</td>
<td>4</td>
<td>148</td>
</tr>
<tr>
<td><strong>Darbāri</strong></td>
<td>T 4</td>
<td>83</td>
<td>29</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td><strong>SH &amp; SD</strong></td>
<td>S 5</td>
<td>152</td>
<td>78</td>
<td>3</td>
<td>160</td>
</tr>
<tr>
<td><strong>P. Kalyān</strong></td>
<td>T 6</td>
<td>35</td>
<td>22</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td><strong>SH &amp; TP1</strong></td>
<td>S 4</td>
<td>205</td>
<td>69</td>
<td>3</td>
<td>125</td>
</tr>
<tr>
<td><strong>Bāgeśri</strong></td>
<td>T 4</td>
<td>92</td>
<td>31</td>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td><strong>SH &amp; TP1</strong></td>
<td>S 4</td>
<td>257</td>
<td>76</td>
<td>3</td>
<td>80</td>
</tr>
<tr>
<td><strong>Jhiğiḥoṭī</strong></td>
<td>T 4</td>
<td>79</td>
<td>24</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td><strong>SH &amp; TP2</strong></td>
<td>S 4</td>
<td>166</td>
<td>68</td>
<td>4</td>
<td>121</td>
</tr>
<tr>
<td><strong>Bāgeśri</strong></td>
<td>T 4</td>
<td>80</td>
<td>32</td>
<td>4</td>
<td>64</td>
</tr>
<tr>
<td><strong>SP1 &amp; SD</strong></td>
<td>S 4</td>
<td>196</td>
<td>70</td>
<td>5</td>
<td>106</td>
</tr>
<tr>
<td><strong>Pūriyā</strong></td>
<td>T 5</td>
<td>68</td>
<td>30</td>
<td>4</td>
<td>37</td>
</tr>
<tr>
<td><strong>SP2 &amp; SD</strong></td>
<td>S 4</td>
<td>145</td>
<td>74</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td><strong>Yaman</strong></td>
<td>T 4</td>
<td>52</td>
<td>26</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td><strong>SP3 &amp; SD</strong></td>
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<td>167</td>
<td>66</td>
<td>1</td>
<td>280</td>
</tr>
<tr>
<td><strong>Jhiğiḥoṭī</strong></td>
<td>T 5</td>
<td>68</td>
<td>34</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Mean Values</strong></td>
<td>S 4</td>
<td>192</td>
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<td>138</td>
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<td></td>
<td>T 4.6</td>
<td>69</td>
<td>29</td>
<td>2.875</td>
<td>39</td>
</tr>
</tbody>
</table>

Table 9 provides a detailed account of the nine performances’ syntagmatic structure, including: (i) each instrument’s number of solos for both the first and second *gat* section; (ii) sitar and tabla solo average durations for each *gat* section (in seconds); (iii) the proportion of each *gat* section consisting of either sitar or tabla solos; (iv) the overall proportion of sitar and tabla solos throughout the entire performance; and (v) each performance’s connectivity rating. My method for determining the number of sitar and tabla solos, as well as their average duration and proportion, was the
same as the one used for the syntagmatic analysis of NB and ZAK’s performance of rāg Sindhu Khamāj (see section 4.3, Chapter Four).

5.6.1.2 Discussion

The plot in Figure 18 below relates connectivity ratings with each performance’s overall tabla solo proportion, illustrating a roughly linear relation between higher ratings and more prominent tabla solos, and somewhat supporting the initial hypothesis.

However, this linearity is disrupted when it comes to performances with average connectivity ratings (3), which have both the highest and the lowest tabla solo proportions. Thus, this initial analysis suggests that while there might have been a relationship between longer tabla solos and stronger feelings of connectivity throughout these nine performances, this relationship may have also been affected by other varying factors.

![Figure 18](attachment:image.png)  
**Figure 18** Relation between tabla solo percentage and connectivity ratings for case study’s nine performances.
As shown in Figure 19 below, the main factor affecting tabla solos’ relative prominence seems to have been ensemble configuration (i.e. Shyam and Sandeep (SH+SD); Shyam with other tabla players (SH+OTP); and Sandeep with other sitarists (OSP+SD)).

Figure 19 Relation between tabla solo proportion and ensemble configuration for case study’s nine performances.

More specifically, these results show that the relative prominence of tabla solos was strongly determined by whether or not Sandeep played tabla, since his performances have consistently lower tabla solo ratios than those in which Shyam played with other tabla players (i.e. SH + OTP). In other words, throughout these nine performances Sandeep played consistently shorter solos than the other tabla players, and this appears to have been the prime factor affecting syntagmatic structure across the case study. This pattern can also be discerned in Table 9, by noting that TP1 and TP2’s average tabla solo durations were generally longer than Sandeep’s.
However, the question remains as to whether feelings of connectivity might have still been related to the prominence of tabla solos within each particular ensemble configuration. Figure 20 above describes the relationship between tabla solo proportion and ensemble configuration, as well as the level of connectivity for each performance (according to each point’s colour). To simplify matters, performances with 3.5 and 4 connectivity ratings are grouped together as high or ‘above average’ and shown in blue, while performances with average connectivity ratings (i.e. 3) are shown in orange, and the only one performance with low connectivity rating (i.e. 2.5) is shown in red. Grouping performances with connectivity ratings of 3.5 and 4 together does not make any difference to this specific analysis, as no single ensemble configuration had performances with both of these ratings.

Figure 20 reveals three entirely different scenarios, which might seem to refute any chance of connectivity having a relation to syntagmatic development. The plot illustrates that Shyam and Sandeep’s joint performances are the only ones in which
higher tabla solo proportions correspond with higher connectivity ratings. Conversely, Shyam’s performances with other tabla players display higher tabla solo proportions for performances with medium connectivity ratings (Shyam & TP2) than with high ratings (Shyam & TP1), whereas in the performances in which Sandeep played with other sitarists, tabla solo proportions were higher for the performance with low connectivity (SP1 & Sandeep) than the one with medium connectivity (SP2 & Sandeep).

One might conclude that this apparently random ordering implies that there is no consistent relation between a performance’s syntagmatic structure and performers’ feelings of musical connectivity. But before arriving at this conclusion, it is important to consider the social factors discussed in section 5.4, involving performers’ relative age and status. In the case of Sandeep’s performances with other sitarists, recall that SP2 was significantly older than Sandeep, whereas SP1 was significantly younger. Not surprisingly, this seems to have been an important factor determining the length of Sandeep’s solos, since his tabla solo proportion is highest when playing with the younger sitarist (27%) and lowest when playing with the older sitarist (21%). These results suggest that seniority may have been an important factor in determining the length of Sandeep’s solos during his performances with other sitar players.

Regarding Shyam’s performances with other tabla players, I pointed out earlier that TP2 occupied a slightly higher musical status than Shyam. This, I believe, is likely to be the reason why TP2’s tabla solos encompass the largest portion of any of the nine performances (33%). As the most established performer, it is understandable that
TP2 is inclined to play longer tabla solos and Shyam is willing to play shorter sitar solos in order to accommodate to his accompanist’s higher musical status. Hence, according to what happened throughout both Shyam and Sandeep’s performances with other players, it appears that performers’ relative age and status was probably the most important factor shaping syntagmatic structure, with older and/or more established performers taking relatively longer solos than what would be expected from performers of the same age and status.

Yet – putting aside matters of age and status - I would argue that the results of this case study also suggest that there may have still been a relation between musical connectivity and a more egalitarian syntagmatic structure. This is precisely what happened during the three performances in which Shyam and Sandeep played together, where the performance with highest connectivity ratings also has the highest tabla solo percentage (29%). Moreover, if we exclude the performance of Shyam and TP2 – which has both the highest tabla solo percentage and the highest ranking tabla player – all other performances with high tabla solo percentages also have the highest connectivity ratings. This can be easily noted in Figure 19, since - except for the orange point in SH+OTP, which represents TP2’s performance - the highest region in the chart is occupied by highly connected performances (i.e. blue points).

Further evidence supporting the idea of a relation between syntagmatic structure and connectivity can be seen by referring to the performance of rāg Jhiñjhoṭī by SP3 and Sandeep, which received the lowest connectivity rating. Table 9 above shows
that during the first gat section Sandeep’s solo proportion is very high (34%), while in contrast, he did not play a single solo throughout the second gat section. Not surprisingly, Sandeep identified the beginning of the vilambit section as the moment of highest connectivity, and most of the drut and jhālā sections as the period of lowest connectivity. To me, this performance’s drut section represents a breakdown at the formal level of musical interaction, which was certainly related to low connectivity between performers.

5.6.1.3 Conclusion

The results of this case study include evidence which both supports and refutes certain aspects of my initial hypothesis regarding musical connectivity and syntagmatic structure. On the one hand, they display what might be interpreted as a mild relationship between musical connectivity and a more egalitarian syntagmatic structure. On the other hand, these results refute the notion that feelings of connectivity may undermine social distinctions at a formal level of musical interaction. I have offered an interpretation that what these results seem to indicate is that the relationship between sitar and tabla performers’ formal interactions and their feelings of connectivity is mediated by their entrenched social relationship, which is in turn primarily defined by age and status. Therefore, whereas performers’ who are approximately equal in terms of age and status are likely to manifest musical connectivity at a formal level by allowing for longer tabla solos and a more egalitarian syntagmatic structure, performers of unequal age/status may interact in a non-egalitarian manner, and yet come to experience strong feelings of connectivity.
Ultimately, based on these results and my own personal experience, I propose that the relationship between formal interaction and musical connectivity is primarily determined by the extent to which syntagmatic structure aligns with each performer’s varying expectations in this regard. Although, as I argued in Chapter Four (section 4.3), their expectations are likely to gravitate towards a 3:1 ratio, they may nevertheless vary significantly according to both personal and social factors. This supports the proposition I have been developing throughout the previous sections in this chapter, that musical connectivity is fundamentally determined by the extent to which a performance complies, exceeds, or contradicts each performer’s personal expectations.

### 5.6.2 Analysis on the Relationship between Rhythmic Interaction and Musical Connectivity

Throughout these last two chapters, I frequently assumed the existence of a relationship between musical connectivity and high levels of rhythmic interaction. There are several reasons for making this assumption. Firstly, the performers I interviewed often emphasised the importance of adapting and responding to each other’s musical actions in order to experience connectivity. For instance, the reader may recall Sandeep’s remark that the main problem in his performance with SP3 was that, unlike Shyam or SP1, she was not responding (p. 184); or Shyam’s praise of Sandeep for knowing how to respond to the low Dha note falling on sam in rāg Darbārī (p. 193).
Secondly, rhythmic interactions among sitar and tabla performers typically require them to attend to each other’s actions, interpret the intention behind this action, and be willing to adapt to what the other performer’s action requires as a response. These are processes which rely both on shared attention (Keller, 2008) and intentional inference (McCaleb, 2014), as well as empathic attunement between performers, all of which are likely to promote heightened feelings of shared subjectivity, especially of an intersubjective nature (see sections 1.4 and 6.2). However, I shall now investigate whether this hypothetical relation between rhythmic interaction and musical connectivity holds empirically throughout these nine performances.

5.6.2.1 Method of Data Collection

Quantifying and comparing levels of rhythmic interaction across nine performances is by no means a simple task. Rhythmic interactions can be of numerous kinds, degrees of complexity, and duration. They may also involve varying degrees and manners of response from the duo partner.

My first attempt at analysing performers’ rhythmic interactions consisted in developing a large list of categories which included cadential phrases (tihāïs and mukhrās), imitation (one performer imitating what the other performer had recently played), synchronization (one performer anticipating and thereby synchronizing with the other), and complementarity (one performer ‘filling in’ the other performer’s rhythmic gaps). However, I eventually realized that categorizing musical behaviour in this way posed too many complications and was ultimately too ambiguous and subjective for rigorous empirical analysis.
Consequently, I eventually adopted a less ambitious approach. I decided to focus solely on cadential patterns - which are fairly easy to identify objectively - by exploring both the number of cadential patterns in each performance and the extent and manner in which one performer’s cadence did or did not trigger a response from the co-performer. In addition, I also realized that while identifying cadential patterns became a lot harder in faster tempos, for two main reasons. Firstly, because the gat is a lot shorter and sitarists tend to repeat it more often, making it a lot harder to judge whether each of these cases consists of a cadential pattern (since the gat obviously includes the mukhrã, but it is not being used in order to culminate an improvisation on sam). And secondly, because the ṭhekā is going on at a faster tempo, which makes it harder to distinguish instances in which a tabla player is merely decorating the ṭhekā from an actual response being triggered by the sitarist. Therefore, I eventually decided to focus only on cadential patterns in the first gat section of each performance.

Admittedly, this approach can only capture a small portion of all the rhythmic interactions which may normally take place throughout a performance, but one which, on the other hand, can be objectively quantified and compared. It should also be noted that these are the kinds of interactions that are more likely to involve reflective awareness, since, as I argued in Chapter Three, cadential patterns are clear indicators of performers’ musical intentions to culminate a phrase on sam. Consequently, the following analysis will inform us primarily about sitar and tabla performers’ social experiences at an intersubjective level.
As I explained in section 3.8, there are three main kinds of cadential patterns with which a sitarist can conclude an improvisational passage on sam; namely, by playing the mukhrā, by playing a tihāī, or by playing the mukhrā preceded by a tihāī.Tabla solos are mostly limited to just tihāīs or cakkardārs, which are essentially longer, more complex tihāīs. I therefore began by identifying and counting the number of cadential patterns during the first gat section for each of the nine performances. I then judged whether each of these cadential patterns did or did not trigger a reaction from the other performer. I decided to define a ‘triggered reaction’ as either a synchronized accent or a noticeable departure from the gat or ōhekā, which I perceived as complementing the other performer’s cadence. I should also note that such reactions were more overt in the case of the tabla player responding to the sitarist’s cadence, whereas the most common way in which sitarists emphasised the tabla players’ tihāīs was through synchronized accents (often by striking the resonating taraf strings).

Based on these data, I produced a table for each of the nine performances, identifying and quantifying different kinds of cadential patterns and whether they triggered a reaction from the co-performer, which formed the basis for comparative analysis. As an example, Table 10 shows the results for the performance of rāg Yaman by Shyam and Sandeep. The various columns describe different kinds of rhythmic interactions as well as the reaction or lack of reaction from the co-performer. Each row describes the kind and number of cadential patterns taking place during each sitar and tabla solo. The columns include two categories for tabla solos (i.e. tihāī with or without reaction from the sitarist) and six categories for sitar solos (i.e. mukhrā, tihāī, or tihāī
leading into *mukhrā*, with or without reaction from the tabla player). In addition, the last row indicates the number of times each of these cadential patterns occurs throughout the first *gat* section.

*Table 10 Cadential patterns and responses for rāg *Yaman*, by Shyam and Sandeep.*

<table>
<thead>
<tr>
<th>Solo</th>
<th>Tabla solos</th>
<th>Sitar Solos</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tihāī with reaction</td>
<td>Tihāī without reaction</td>
</tr>
<tr>
<td>T1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>T2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>T3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>T4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

5.6.2.2 Results

The data collected throughout these nine performances are combined and presented in Table 11 below. This table includes information on the total number of cadences during the first *gat* section of all nine performances, as well as the mean frequency with which each category occurred throughout all nine performances.
Table 11 Cadential patterns and responses for case study’s nine performances.

<table>
<thead>
<tr>
<th>Perform.</th>
<th>Tabla Solo</th>
<th>Sitar Solo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tihāī with reaction</td>
<td>Tihāī without reaction</td>
</tr>
<tr>
<td>Yaman</td>
<td>1 2</td>
<td>13 10 - 4 2 1</td>
</tr>
<tr>
<td>Darbārī</td>
<td>2 2</td>
<td>14 - - 4 2 -</td>
</tr>
<tr>
<td>P. Kal.</td>
<td>3 2</td>
<td>10 2 - 8 4 -</td>
</tr>
<tr>
<td>Bāgesrī</td>
<td>4 1</td>
<td>14 4 5 4 5 -</td>
</tr>
<tr>
<td>Jhiñjhoṭī</td>
<td>1 3</td>
<td>8 6 1 11 6 1</td>
</tr>
<tr>
<td>Bāgesrī</td>
<td>2 2</td>
<td>22 7 2 1 4 -</td>
</tr>
<tr>
<td>Pūriyā</td>
<td>5 1</td>
<td>10 1 5 8 - -</td>
</tr>
<tr>
<td>Yaman</td>
<td>2 2</td>
<td>2 1 7 11 6 -</td>
</tr>
<tr>
<td>Jhiñjhoṭī</td>
<td>- 5</td>
<td>11 3 3 - - -</td>
</tr>
<tr>
<td>Mean</td>
<td>2.2 2.2</td>
<td>11.6 3.8 2.6 5.7 3.2 0.2</td>
</tr>
</tbody>
</table>

5.6.2.3 Discussion

Let us begin this discussion by drawing some general observations from Table 11. Firstly, almost every tabla solo ends with a tihāī (remember that the mean number of tabla solos for first gat sections was 4.6 (see Table 9, p. 199), and the mean amount of tabla solos ending with a tihāī is 4.4), and exactly half of these are accompanied by a response from the sitarist. It is worth noting that the only case in which the sitarist did not respond to any of the tabla solos’ tihāīs was the performance of rāg Jhiñjhoṭī by SP3 and Sandeep, after which, as we have already seen, Sandeep complained about SP3’s lack of interaction. In contrast, Sandeep praised SP1 for his responsiveness, and this table shows that their performance of rāg Pūriyā was the one in which the sitarist responded the most to the tabla player’s tihāīs. This means that Sandeep’s impressions in this regard are supported empirically.
Secondly, mukhrās are by far the most common form of cadential pattern during sitar solos (15.4 vs 8.3 tihāis, and 3.4 tihāī + mukhrā), most of which are accompanied by a response from the tabla player (slightly above 75%). Tihāis occur about half as frequently as mukhrās, and moreover, are less likely to trigger a reaction from the tabla player (only 31% of the time). It is easy to understand why this is so. Mukhrās always start from the same mātrā (normally mātrā 12 in vilambit tīntāl, and mātrā 8 in madhya jhaptāl) and are easily recognizable, which consequently makes it easy for the tabla player to react accordingly. Tihāis, on the other hand, are far less predictable. They can start from any beat and assume any number of shapes. Moreover, the tabla player must normally hear two repetitions of the pattern before he can be absolutely sure it is tihāī, which gives him less scope for reaction.

Thirdly, although a tihāī leading into the mukhrā is by far the less frequent form of cadential pattern, it almost always triggers a response from the accompanist (95% to be precise). This is due to the same reasons just explained. A tihāī leading into the mukhrā gives the tabla player a clear warning that a cadential pattern is taking place. In fact, the cadential effect of a tihāī plus mukhrā is so strong it would sound strange for a tabla player not to react in any way. The only two cases in which this did in fact happen were both in madhya jhaptāl, which have relatively short 3-mātrā-long mukhrās, and which makes the lack of reaction from the tabla player less outstanding.

Moving on to matters of musical connectivity, Table 12 compresses the number of cadences presented in Table 11 into only five categories to facilitate comparative analysis. These four categories consist of (i) total number of cadences; (ii) number of
The document contains information about the structure of tabla solos in Indian classical music. It describes categories such as the number of mukhrās with reaction, the number of tihāīs, including cadences with both tihāī and mukhrā, and the number of tihāīs with reaction. These categories include cadences taking place during both sitar and tabla solos (except for mukhrās, which can only take place during sitar solos).

**Table 12**  Tāl, connectivity ratings, and number of cadential patterns for case study’s nine performances.

<table>
<thead>
<tr>
<th>Con. Rating</th>
<th>Tāl</th>
<th>Total n. of cadences</th>
<th>N. of mukhrās</th>
<th>N. of mukhrās with react.</th>
<th>N. of tihāīs</th>
<th>N. of tihāīs with react.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yaman</td>
<td>3.5</td>
<td>jhaptāl</td>
<td>33</td>
<td>23</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Darbārī</td>
<td>3</td>
<td>tintāl</td>
<td>24</td>
<td>14</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>P. Kalyān</td>
<td>3</td>
<td>tintāl</td>
<td>29</td>
<td>12</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Bāgeśrī</td>
<td>4</td>
<td>jhaptāl</td>
<td>37</td>
<td>18</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Jhiṇḍhoṭī</td>
<td>4</td>
<td>jhaptāl</td>
<td>37</td>
<td>14</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Bāgeśrī</td>
<td>3</td>
<td>jhaptāl</td>
<td>40</td>
<td>29</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>Pūriyā</td>
<td>3.5</td>
<td>tintāl</td>
<td>30</td>
<td>11</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Yaman</td>
<td>3</td>
<td>tintāl</td>
<td>31</td>
<td>3</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Jhiṇḍhoṭī</td>
<td>2.5</td>
<td>tintāl</td>
<td>22</td>
<td>14</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>

**Figure 21** Relation between connectivity ratings and total number of cadences, during first gat sections of the case study’s nine performances.

As the Figure 21 shows, these data would appear to suggest a relationship between higher connectivity ratings and larger number of cadences during the first gat section.
of these nine performances. However, there is an anomaly worth noting regarding Shyam’s performance of rāg Bāgeśrī with TP2, which had the highest number of cadences (40), but was reported as having only average levels of connectivity. Moreover, as the Figures 22 and 23 below show, the relationship between number of cadences and connectivity appears to have been more consistent with regards to tihāśis rather than mukhrās.

**Figure 22** Relation between connectivity ratings and total number of mukhrās, during first gat sections of the case study’s nine performances.

**Figure 23** Relation between connectivity ratings and total number of tihāśis, during first gat sections of case study’s nine performances.
This finding suggests that *tihāīs* have a greater impact on performers’ feelings of musical connectivity than *mukhrās*. Furthermore, according to these data there was also a more consistent relationship between higher connectivity ratings and larger number of *tihāīs* triggering a reaction from the co-performer, as opposed to *mukhrās*, as can be seen in the following two graphs.

**Figure 24** Relation between connectivity ratings and total number of *mukhrās* with reaction, during first *gat* sections of case study’s nine performances.

**Figure 25** Relation between connectivity ratings and total number of *tihāīs* with reaction, during first *gat* sections of case study’s nine performances.
Yet again, there is another anomaly worth noting with regards to Sandeep’s performance of \textit{rāg Yaman} with SP2, which had the largest number of \textit{tihāīs} (28) and the largest number of reactions to \textit{tihāīs} (15), and yet had average connectivity levels (3). Or, conversely, Shyam and Sandeep’s performance of \textit{rāg Darbārī}, which was rated quite highly (3.5) and yet has one of the lowest number of \textit{tihāīs} (10) and responses to \textit{tihāīs} (3).

In the first case, SP2 and Sandeep’s average connectivity rating may have been caused by their slight feelings of animosity, resulting from SP2 older age and willingness to impose his higher status, which I reported earlier. In the second case, Shyam and Sandeep explained that their feelings of connectivity were brought forth primarily through melodic means, particularly with regards to \textit{rāg Darbārī’s} emotional depth, which may have called for less overt rhythmic interaction (as I suggested was the case in Nikhil Banerjee’s and Zamir Ahmed Khan’s performance, in Chapter Four). In any event, these various anomalies within a relatively small sample of performances call for caution in positing a direct relationship between number of cadences and feelings of connectivity.

Furthermore, it is also worth considering the effect that \textit{tāl} may have had on the number and kind of cadences in each performance. As Figure 26 shows, performances in \textit{madhya jhaptāl} had consistently more \textit{mukhrās} than those in \textit{vilambit tīntāl}. This, I would argue, is almost certainly because the duration of one cycle in \textit{madhya jhaptāl} is a lot shorter than in \textit{vilambit tīntāl}, which therefore presents more opportunities for carrying out cadences.
However, it is interesting to note that *tal* had practically no effect on the number of *tihāīs*, as illustrated in Figure 27 below. This last finding can be interpreted as further evidence that a performance’s number of *tihāīs* has a stronger impact on performers’ social experiences than the number of *mukhrās*, which is primarily determined by metric structure.
5.6.2.4 Conclusion

Overall, this empirical analysis provides some evidence in support of a relationship between a performance’s number of cadences and performers’ feelings of connectivity. This relationship seems to be more strongly determined by the number of tihāīs, whereas the number of mukhrās seems to be primarily determined by the choice of tāl and lay (with shorted and faster metres allowing for a larger number of mukhrās). However, taking into account the various anomalies identified across these nine performances, tihāīs appear to be just one of the many ways in which sitar and tabla performers are able to connect, and performers may therefore still experience strong feelings of connection without interacting too overtly.

Based on these findings and on my ethnographic insight, I would argue that performances with high levels of connectivity may have a tendency towards higher levels of overt rhythmic interaction, but that there may be various other musical factors affecting this relationship, such as the choice of tāl, the music’s expressive character, and so forth. Performances with high levels of rhythmic interaction (and few technical mistakes) will generally be permeated by positive social experiences but a performance with low levels of rhythmic interaction may nevertheless be permeated by strong experiences of musical connectivity brought forth through pre-reflective, co-subjective means. This idea is explored in more detail in the following chapter.
5.6.3 Analysis on the Relationship between Micro-Temporal Interactions and Connectivity

This section explores the relationship between performers’ self-reported connectivity ratings and the quality and character of their micro-temporal interactions (i.e. interactions lying largely below the 100 ms threshold of rhythmic perception (London, 2004)). As with the analysis of Pt. Nikhil Banerjee and Zamir Ahmed Khan in Chapter Four, I analyse performers’ micro-temporal interactions in terms of isochronization, asynchronization, and interpersonal entrainment (i.e. relative phase and length of mean vector).

To recap, the term isochronization refers to ‘the standard deviation of tone durations meant to be equal’ (Rasch, 1988, p. 75); asynchronization refers to the standard deviation of quasi-simultaneous onsets (idem, p. 74); relative phase refers to performers’ micro-temporal position in relation to each other; and length of mean vector describes the strength of their coupling (the extent and consistency with which a certain relative phase is maintained). For a more detailed explanation of the meaning of each of these terms, see section 4.5 in Chapter Four.

Before proceeding, I would like to briefly consider the following question: Why would performers’ feelings of musical connectivity be in any way affected by what happens at a micro-temporal level? After all, as I pointed out in Chapter Four, micro-timing lies largely beyond conscious awareness and intentional control, and as one might expect, at no point did any of the musicians I interviewed throughout my research explicitly refer to their micro-temporal interactions as a factor affecting their feelings
of connectivity. However, there are two main reasons why micro-temporal interactions may nevertheless have a significant effect on the performers’ feelings of sociality.

Firstly, as I explained in Chapter One (section 1.3.2), the capacity for interpersonal entrainment is one of the main factors why joint musical participation may often promote feelings of social cohesion among participants (see Hove & Risen, 2009; Overy & Molnar-Szakacs, 2009; Kirschner & Tomasello, 2009). Therefore, the level and manner in which performers’ actions are coupled may presumably influence their feelings of togetherness. Secondly, there is wide ranging empirical evidence showing that micro-temporal asynchronies play a key role in generating musical expressivity (Rasch, 1988; Repp, 1995, 1999; Wesolowski, 2016), defining stylistic character (Collier & Collier, 1996; London & Pollak, 2013), and arguably (see Davies et al., 2013; Madison & Sioros, 2014), in eliciting pleasurable bodily responses to music such as groove (Iyer, 2002; Doffman, 2013). Interactions occurring at a micro-temporal level may consequently have a significant effect on performers’ pre-reflective, bodily, and co-subjective (McGuiness & Overy, 2011) levels of musical and social experience.

5.6.3.1 Methodology

The method of data collection and analysis was identical to that carried out in Chapter Four, for the analysis of rāg Sindhu Khamāj by Pt. Nikhil Banerjee and Zamir Ahmed Khan, involving the manual extraction of all performers’ onset timing data to the nearest millisecond for onsets occurring on the beat (interpreted as the periodic level
falling nearest to the range of maximal pulse salience), and excluding the sitar’s *chikarī* and *taraf* strings. For a more detailed explanation refer to section 4.5.1.

My initial intention was to carry out micro-temporal analyses comparing specific moments in the performances identified by the performers as displaying either high or low connectivity. However, I eventually had to adopt a different approach for several reasons. Firstly, as I explained in Chapter Four, the possibility of extracting precise onset data, particularly for the sitar, becomes increasingly challenging during fast tempos such as in *drut lay* and *jhālā*, which meant that some of the passages identified by the performers as consisting of either high or low connectivity could not be analysed micro-temporally. Secondly, as the analysis of NB and ZAK revealed, micro-temporal interactions among sitar and tabla performers are shaped by both surface rhythm (i.e. melismatic or syllabic) and formal development, meaning that a comparative analysis between, for instance, a fast *tān* passage towards the end of a performance and a slow melismatic one at the very beginning may not be very revealing.

I therefore decided to carry out a comparative analysis focusing exclusively on the second sitar solo (S2) for each performance’s first *gat* section. The reason why I chose this particular solo is because the slow tempos that characterize the opening stages of a performance facilitate onset extraction. Overall, this analysis involved identifying and extracting timing data for approximately 2,500 onsets.
5.6.2.2 Results

Table 13 below presents the micro-timing data for the second sitar solo of each performance (in milliseconds and degrees), as well as each solo’s underlining tāl and duration (in seconds). It also includes a summary of performers’ level of familiarity and connectivity ratings. This data will form the basis for the following comparative analysis.

Table 13 Micro-timing values for nine performances’ second sitar solo.

<table>
<thead>
<tr>
<th></th>
<th>Shyam &amp; Sandeep</th>
<th>Shyam &amp; OTP</th>
<th>OSP &amp; Sandeep</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rāg</strong></td>
<td>Yaman</td>
<td>Darbārī</td>
<td>P. Kalyān</td>
</tr>
<tr>
<td>Familiarity</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Con. Rating</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>S. Iso. (ms)</td>
<td>52</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>T. Iso. (ms)</td>
<td>37</td>
<td>41</td>
<td>44</td>
</tr>
<tr>
<td>Async. (ms)</td>
<td>41</td>
<td>39</td>
<td>23</td>
</tr>
<tr>
<td>R. Phase (°)</td>
<td>-2.5</td>
<td>-1.8</td>
<td>0.5</td>
</tr>
<tr>
<td>L. Vector</td>
<td>0.93</td>
<td>0.936</td>
<td>0.975</td>
</tr>
<tr>
<td><strong>Tāl</strong></td>
<td>jhaptāl</td>
<td>jintāl</td>
<td>jintāl</td>
</tr>
<tr>
<td><strong>Dur. (sec)</strong></td>
<td>184</td>
<td>235</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Bāgeśrī</td>
<td>Jhiṅjhoṭī</td>
<td>Bāgeśrī</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>31</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>-7</td>
<td>3.1</td>
<td>-0.2</td>
</tr>
<tr>
<td></td>
<td>0.917</td>
<td>0.945</td>
<td>0.963</td>
</tr>
<tr>
<td></td>
<td>jhaptāl</td>
<td>jhaptāl</td>
<td>jhaptāl</td>
</tr>
<tr>
<td></td>
<td>192</td>
<td>302</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>jintāl</td>
<td>jintāl</td>
<td>jintāl</td>
</tr>
<tr>
<td></td>
<td>94</td>
<td>83</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>Pūriyā</td>
<td>Yaman</td>
<td>Jhiṅjhoṭī</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>3.5</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>36</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>32</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>-9.9</td>
<td>5.1</td>
<td>-5.3</td>
</tr>
<tr>
<td></td>
<td>0.944</td>
<td>0.93</td>
<td>0.963</td>
</tr>
</tbody>
</table>

To consider these results in a wider context, let us begin by comparing them with the results obtained from the performance of rāg Sindhu Khamaj by Nikhil Banerjee and Zamir Ahmed Khan. Since the current analysis is based entirely on second sitar solos, Table 14 below shows the various micro-temporal values for NB’s second sitar solo as well as mean values for all sitar solos for a broader perspective. It should be noted that the combined asynchronization, relative phase, and length of vector values for the nine performances were calculated by using every single onset time difference values, whereas mean isochronization values were calculated based on the final isochronization values for each separate performance. This is due to the problem that
arises from calculating isochronization over large changes in tempo, as explained in section 4.5.2.

**Table 14** Mean isochronization, asynchronization, relative phase, and length of vector values for nine performances, compared with NB & ZAK’s results for S2 and for combined sitar solos.

<table>
<thead>
<tr>
<th></th>
<th>9 Performances S2</th>
<th>NB &amp; ZAK S2</th>
<th>NB &amp; ZAK All SS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sitar M. Isochronization (ms)</strong></td>
<td>41</td>
<td>71</td>
<td>36</td>
</tr>
<tr>
<td><strong>Tabla M. Isochronization (ms)</strong></td>
<td>35</td>
<td>38</td>
<td>34</td>
</tr>
<tr>
<td><strong>Asynchronization (ms)</strong></td>
<td>35</td>
<td>64</td>
<td>44</td>
</tr>
<tr>
<td><strong>Relative Phase (°)</strong></td>
<td>-1.5</td>
<td>-8.8</td>
<td>-5</td>
</tr>
<tr>
<td><strong>Length of Vector</strong></td>
<td>0.94</td>
<td>0.868</td>
<td>0.919</td>
</tr>
</tbody>
</table>

In some respects, these results show very similar patterns of micro-temporal interaction to those obtained from the NB/ZAK analysis, and therefore provide further evidence supporting several of the conclusions proposed in Chapter Four. These include the following: (i) sitarists tend to lag behind tabla players, as described by negative relative phase values, and (ii) isochronization is greater for soloists than accompanists. Throughout all nine performances, there were only three instances in which the tabla player lagged behind the sitarist, and only one instance in which the tabla player has higher isochronization values. Given how consistent these patterns in relative phase and isochronization proved to be in NB and ZAK’s performance, and their relative consistency throughout these nine performances as well, we may presume that they are likely to characterize most other sitar and tabla performances too.

At the same time, the comparison between NB and ZAK’s performance and these nine performances also reveal some interesting distinctions. First of all, NB and ZAK’s asynchronization value for S2 (64 ms) is notably higher than for any of the nine
individual performances, and almost double the nine performances’ combined asynchronization (35 ms). NB and ZAK’s asynchronization value throughout all sitar solos (44 ms) is also higher than most asynchronization results from the case study. Furthermore, NB and ZAK display lower levels of coupling than the performers in this case study (0.94), both during S2 (0.868) and throughout all of NB’s sitar solos (0.919). All of this indicates that the micro-temporal interactions among the more proficient performers (i.e. NB and ZAK) were – contrary to what one might expect - less synchronized and coupled. I will discuss this issue in more detail shortly, but before doing so let us explore the possible relationship between these performers’ micro-temporal interactions and their connectivity ratings.

Table 15 Mean isochronization, asynchronization, relative phase, and length of vector values according to connectivity ratings.

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>3.5</th>
<th>3</th>
<th>2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitar M. Isochronization (ms)</td>
<td>43</td>
<td>43</td>
<td>40</td>
<td>38</td>
</tr>
<tr>
<td>Tabla M. Isochronization (ms)</td>
<td>32</td>
<td>33</td>
<td>38</td>
<td>34</td>
</tr>
<tr>
<td>Asynchronization (ms)</td>
<td>37</td>
<td>38</td>
<td>33</td>
<td>27</td>
</tr>
<tr>
<td>Relative Phase (°)</td>
<td>0.72</td>
<td>-5.5</td>
<td>0.31</td>
<td>-5.3</td>
</tr>
<tr>
<td>Length of Vector</td>
<td>0.932</td>
<td>0.933</td>
<td>0.947</td>
<td>0.963</td>
</tr>
</tbody>
</table>

In order to do so, I calculated mean isochronization, asynchronization, relative phase, and length of mean vector values according to connectivity ratings (see Table 15), and plotted separate graphs representing the relationship between these four measurements and connectivity ratings for each of the nine performances (see Figures 28 to 31 below). It is worth clarifying that, as with Table 14, asynchronization, relative phase, and length of vector values were calculated by taking every single onset time difference pertaining to performances with the same connectivity ratings,
whereas mean isochronization values were calculated based on the final isochronization value for each separate performance.

**Figure 28** Relation between sitar and tabla isochronization and connectivity ratings for case study’s nine performances.

**Figure 29** Relation between asynchronization and connectivity ratings for case study’s nine performances.
To start, I would argue that these figures show no relationship between these performers’ connectivity ratings and their relative phase. This is evident both regarding mean values (0.72°, -5.5°, 0.31°, -5.3°) and the way in which dots are distributed in Figure 30, which show no trend at all. These results therefore suggest
that – in this particular case study – performers’ relative phase values display no noticeable relationship to their self-reported feelings of connectivity.

Secondly, these results also show no conclusive relationship between performers’ isochronization and connectivity. On the one hand, sitar values display a mild trend for increase in isochronization in parallel to increase in connectivity (mean values are 43, 43, 40 and 38 ms). On the other hand, tabla isochronization values display the opposite trend (32, 33, 38 and 34 ms). One possible interpretation is that musical connectivity may be related to a more isochronous accompaniment and a more fluid, less isochronous, soloing. However, even this pattern is not consistent enough to make any definitive claim in this regard, as can be seen by the more or less random distribution of points in Figure 28.

Thirdly, these results reveal a more consistent relationship between higher connectivity ratings and higher asynchronization values (mean values 37, 38, 33 and 27 ms; see Figure 29), meaning that more connected performers tended to play in a less synchronized manner. In addition, these results also show a consistent relationship between higher connectivity ratings and lower length of mean vector values (mean values 0.932, 0.933, 0.947, 0.963; see Figure 31), which means that performers who reported higher connectivity were also relatively less coupled. Together, both these results and those obtained from the comparison with NB and ZAK’s performance suggest that heightened connectivity in sitar and tabla performance may tend to be brought forth by relatively lower levels of synchronization and coupling. In other words, micro-temporal interactions among
connected and/or proficient performers appear to be – according to this analysis – less precisely coordinated.

However, before jumping to this conclusion, it is worth reflecting on these results more carefully. After all, even within this relatively short sample of performances, there are already various instances that seem to contradict this relationship. For instance, Shyam and TP1’s performance of rāg Jhiṅhoṭī was rated as having the highest connectivity, and yet has a relatively low asynchronization value (31 ms) and a relatively high level of coupling (0.945). Also, asynchronization values for performances with average connectivity ratings (3) ranged from relatively high (39 ms) to relatively low (23 ms) values. Consequently, while these results suggest a relationship between connectivity and both lower synchronization and coupling, there may also have been some other factors influencing these results.

Presumably, one of these factors may have been performers’ choice of tāl and lay. In order to explore this possibility, I present the following two graphs, describing the relationship between underlying metric framework and both asynchronization (Figure 32) and length of mean vector values (Figure 33).

![Figure 32 Relation between asynchronization and tāl for case study’s nine performances.](image-url)
Figure 33 Relation between length of mean vector and tāl for case study’s nine performances.

Although these graphs would appear to suggest a mild relation between tāl and both asynchronization and coupling, the fact that the shortest and fastest tāl (i.e. madhya jhaptāl) has the higher asynchronization values and the lowest length of mean vector values seems to me counterintuitive. If performances in vilambit tīntāl would have had the higher asynchronization values a causal relation between underlying metre and asynchrony could be more plausible. But since the opposite appears to be the case, my interpretation of these results is that this correlation is largely coincidental (maybe due in part to the fact that performances with the highest connectivity ratings also happened to be in jhaptāl), and that some other factor might be affecting this level of interaction.

Furthermore, if we inspect these results more closely, we shall notice that this tendency is essentially determined by two specific performances; on one hand, Shyam and TP1’s performance of Bāgeśrī in jhaptāl, which has both the highest asynchronization value and the lowest length of mean vector value of all nine performances; and on the other hand, Shyam and Sandeep’s performance of P. Kalyān in tīntāl, which in contrast has both the lowest asynchronization value and the
highest length of mean vector value of all nine performances. If it were not for these two performances, there would be practically no difference in asynchronization and coupling according to tāl. Therefore, I would argue that tāl and lay had no significant influence on performers’ micro-temporal interactions in this case study.

**Figure 34** Relation between asynchronization and performers’ familiarity for case study’s nine performances.

![Figure 34](image1)

**Figure 35** Relation between length of mean vector and performers’ familiarity for case study’s nine performances.

Another factor which may have presumably affected these performers’ micro-temporal interactions is familiarity. However, as the Figures 34 and 35 above show,
there does not seem to be any noticeable relation between these performers’ musical familiarity and their micro-temporal interactions. The apparent tendency for performers with medium levels of familiarity to play in a less synchronized and coupled manner can once more be explained by reference to Shyam and TP1’s performance of rāg Bāgeśrī. Therefore, I propose to discard familiarity as a significant factor in this regard.

Next, given that the analysis of NB and ZAK’s performance showed that surface rhythm had a marked effect on their micro-temporal interactions, I decided to explore whether it might have also had an effect here. I therefore went back to my original onset data set for these nine performances and categorized every single sitar onset as either melismatic or syllabic in character (see section 3.8). Although, as Clayton (2000) remarks, this is not a clear-cut distinction, I based my categorization largely on sitar technique; more specifically, on whether the sitarist played in a single string, up-stroke manner which is more often associated with an ālāp (i.e. melismatic) style of playing, or in a double-string, up-and-down-stroke manner which is more often associated with a tān-based approach (i.e. syllabic).

Table 16 presents separate asynchronization and length of mean vector values for each performance’s melismatic and syllabic passages. While most performances combined both types of surface rhythm, some were entirely melismatic or entirely syllabic, which is why they only have values for one of the two rhythmic categories.
Table 16  Nine performances asynchronization and length of mean vector values according to melismatic and syllabic rhythmic character.

<table>
<thead>
<tr>
<th>Rāg</th>
<th>Yaman</th>
<th>Darbārī</th>
<th>P. Kal.</th>
<th>Bāgeśrī</th>
<th>Jhiṇṭhōṭī</th>
<th>Bāgeśrī</th>
<th>Pūriyā</th>
<th>Yaman</th>
<th>Jhiṇṭhōṭī</th>
</tr>
</thead>
<tbody>
<tr>
<td>Con. Rating</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3.5</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>Melismatic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Async. (ms)</td>
<td>52</td>
<td>43</td>
<td>-</td>
<td>49</td>
<td>46</td>
<td>37</td>
<td>-</td>
<td>-</td>
<td>27</td>
</tr>
<tr>
<td>Syllabic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Async. (ms)</td>
<td>37</td>
<td>34</td>
<td>23</td>
<td>42</td>
<td>26</td>
<td>27</td>
<td>32</td>
<td>32</td>
<td>-</td>
</tr>
<tr>
<td>Melismatic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. of Vector</td>
<td>0.901</td>
<td>0.927</td>
<td>-</td>
<td>0.911</td>
<td>0.892</td>
<td>0.947</td>
<td>-</td>
<td>-</td>
<td>0.963</td>
</tr>
<tr>
<td>Syllabic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. of Vector</td>
<td>0.94</td>
<td>0.954</td>
<td>0.975</td>
<td>0.937</td>
<td>0.959</td>
<td>0.969</td>
<td>0.944</td>
<td>0.93</td>
<td>-</td>
</tr>
</tbody>
</table>

As these results show, melismatic passages were consistently less synchronized and less coupled than syllabic ones, which is – as I explained in section 4.5.3 - precisely what one would expect. This suggests that the sitarists’ approach to surface rhythm was probably the fundamental factor in determining levels of asynchronization and coupling throughout this case study. In other words, it means that each performance’s asynchronization and length of mean vector values were largely determined by whether the sitarist chose to play in a melismatic or syllabic manner. It also means that low levels of synchronization and coupling were caused primarily by a greater prominence of melismatic rhythm.

However, after taking into account rhythmic character, the question still remains as to whether connectivity may also be related with this level of musical interaction? In order to explore this possibility, Figures 35 and 36 below relate connectivity ratings and both asynchronization and length of mean vector values, according to their rhythmic character.
These graphs show a more robust relationship between musical connectivity and both asynchronization and coupling than was initially suggested in Figures 29 and 31 (p.226). In Figure 36, we see that melismatic passages are consistently less synchronized than syllabic ones according to connectivity ratings, and that the trend
line describing the relationship between connectivity and asynchronization is slightly steeper for melismatic passages than syllabic ones. This trend is even more pronounced according to length of mean vector values in Figure 37, where we can see that the values for performers’ coupling show little relationship to musical connectivity during syllabic passages, whilst showing a more notable relationship in melismatic passages, with higher levels of connectivity relating to lower levels of coupling. In other words, the relationship between performers’ self-reported connectivity ratings and their micro-temporal interactions was more consistent during melismatic passages than syllabic ones, and more pronounced in terms of coupling than in terms of asynchronization.

Lastly, before discussing the implications of these various results, I thought it would be interesting to visualize how NB and ZAK’s asynchronization and length of mean vector values for S2 (which was entirely melismatic) would fit according to the trends emerging from this case study (see Figures 38 and 39 below).

Figure 38 Hypothetical relation between NB and ZAK’s asynchronization and connectivity, based on the case study’s results.
5.6.3.3 Discussion

Here is a summary of the results obtained through this micro-temporal analysis:

- New evidence supporting conclusions from Chapter Four regarding consistent patterns in sitar and tabla performers’ micro-temporal interactions. These
include a marked tendency for sitarists to lag behind tabla players and for having higher isochronization values than tabla players during sitar solos.

- Data showing that micro-temporal interactions among highly proficient performers (i.e. Nikhil Banerjee and Zamir Ahmed Khan) display higher asynchronization values and lower length of mean vector values, suggesting that lower levels of synchronization and coupling may be valuable qualities of a performance when used appropriately.

- Data showing that neither tāl and lay, nor familiarity, appear to have had a significant effect on these performers’ micro-temporal interactions.

- New evidence showing that the main factor affecting micro-timing is - as already noted in Chapter Four – the sitarist’s choice of rhythmic character, as melismatic passages have consistently higher asynchronization values and lower length of mean vector values than syllabic passages.

- Evidence that performers in this case study experiencing higher levels of connectivity played in a relatively less synchronized and coupled manner. This relationship proved to be more pronounced for melismatic passages than syllabic ones.

Given that the results of this analysis show a consistent relationship between both connectivity and proficiency on the one hand, and lower levels of synchronization and coupling on the other, I propose that a certain ‘looseness’ in micro-temporal coordination may be a desirable quality in sitar and tabla performance, and moreover, that doing so in a successful manner requires a combination of musical
and interpersonal skills. But why? Why would less coordination bring forth stronger feelings of togetherness?

My answer to this question is twofold. Firstly, I would argue that asynchronization is deemed positive because – as several researchers have shown (e.g. Rasch, 1988; Repp 1995; Iyer 2002) - it contributes towards musical expressivity, which in turn is likely to produce shared affective states (Overy & Molnar-Szakacs, 2009). This hypothesis is supported by the fact that the relationship between connectivity and asynchronization was more pronounced in melismatic passages than syllabic ones. Since syllabic passages are defined by a stricter relationship between underlining metre and surface rhythm, expression is less likely to be tied to higher levels of asynchrony. In contrast, melismatic passages may gain in expressivity by being less synchronized and coupled, and hence result in stronger feelings of connection between performers.

Secondly, as I pointed out in Chapter One (section 1.2), Hindustānī music is a ‘presentational’ (Turino, 2008) and in many ways a highly individualistic musical genre, in which both soloists and accompanists are normally very keen to display their own musical talents. Since, as Doffman (2012) has shown, jazz soloists may rely on micro-temporal asynchronies in order to stand out from the ensemble, I would propose that, likewise, sitar and tabla performers might enact this individualism at a micro-temporal level by playing in a relatively less synchronized and coupled manner. Although this proposal might appear to contradict the very idea of connectivity – in that individualism and connectivity are supposedly opposing phenomena – I would
remind the reader of the point made in Chapter One, which is that the notion of what constitutes an ideal social experience may vary quite widely according to genre and context. While ensemble performers in certain genres might presumably aim to achieve the highest possible level of synchronization and coupling, this analysis suggests that sitar and tabla performers, in contrast, may prefer interactions with a certain degree of asynchronization and looser coupling. Therefore, I would argue that one of the fundamental contributions of this micro-temporal analysis is that it reveals an important aspect of sitar and tabla performers’ ideal state of co-subjectivity, which according to these results, is characterized by the prominent use of ‘participatory discrepancies’ (Keil, 1994) in service of musical expression.

Before I bring this analysis to a close, I would like to consider one final question: What distinguishes a skilful/connected performance from an unskillful/unconnected performance with similar asynchronization and coupling values? In other words, considering that unskilful/unconnected performers may also display a significant lack of synchronization and coupling, what makes certain forms of asynchrony and lack of coupling more effective and desirable than others? Although at present I can only offer a brief and somewhat speculative answer to this question, doing so will provide us with greater insight regarding the phenomenology of ensemble performance at this level of musical interaction.

So firstly, I suspect that while micro-temporal interactions among skilful/connected performers may appear relatively less synchronized, they may nevertheless be underlined by precisely coordinated patterns of shared metrical attending, maybe
even more coordinated than for less skilful/connected performers. This would allow them to exploit micro-temporal asynchronies for expressive purposes without risking musical cohesion. In contrast, less experienced or less connected musicians may need to enact more basic aspects of metric entrainment in order to ensure temporal cohesion. This hypothesis is supported by the well-researched fact that joint attending is key in enabling social cooperation and promoting feelings of social unity (see section 1.3.2), as well as by how frequently the performers I interviewed pointed out the importance of paying close attention to their music partner at all times.

Secondly, I also suspect that skilful/connected performers share a pre-reflective and embodied understanding of the appropriate level of asynchronization according to other musical variable such as surface rhythm, form, pitch-contour, timbre, and dynamics. This is a dimension which the analysis of Nikhil Banerjee and Zamir Ahmed Khan touches upon, and which certainly offers more scope for future research; for instance, by carrying out a more detailed analysis of the relationship between micro-temporal asynchronies and a wider range of rhythmic, melodic, and timbre variables, such as Wesolowski (2016) carries out in a recent paper based on Jazz performance.

5.6.3.4 Conclusions

Based on the results of this analysis, it appears that one of the ways in which sitar and tabla performers are likely to enact positive feelings of sociality - specifically during the slower, melismatic stages of a performance - is by skilfully exploiting micro-temporal asynchronies for expressive purposes. Co-subjective experiences between sitar and tabla performers may therefore be characterized by a marked lack
of synchronization and coupling. Meanwhile, it is important to bear in mind that these results refer only to the relatively slow opening sitar solos, and that it is certainly possible - maybe even likely - that performers privilege more closely synchronized micro-temporal interactions during faster passages.

5.7 Conclusions from Case Study:

What does this study reveal regarding the relationship between musical interaction and social experience in sitar and tabla performance? How might one use this newly gained insight as part of a phenomenological investigation of musical connectivity in this genre?

First of all, even within this relatively small sample of performances, we have noted that performers’ expectations of what constitutes a successful performance is affected by numerous social factors, such as co-performers’ relative age, status, and level of familiarity. Consequently, certain interactions that may be deemed inappropriate under certain social conditions may nevertheless result in connectivity in a different social context, and vice versa. This means that in order to understand how musical interaction brings forth positive feelings of sociality, we need to investigate this relationship within the social context in which it occurs. It also means we need to take into account how these various interactions relate to performers’ personal expectations, and ultimately, how they make them feel on a personal level, as well as a social one.
Yet, this research also uncovered some fairly consistent behaviours underlying either positive or negative social experiences, which may suggest that the relationship between musical interaction and social experience may have some consistency across various contexts. In summary, these include:

- Moments of disconnection appear to be most commonly caused by unintentional mistakes.
- Occasionally, these disconnected moments may be caused by some underlining conflict between performers, normally caused by matters pertaining to relative age and/or status.
- Performers’ relative age and status seem to impinge most consistently on their formal interactions and least so on their micro-temporal interactions, probably due – in part – to the different degrees to which these interactions are available to reflective awareness and intentionality.
- Moments of heightened connectivity can be brought forth through both co-subjective and intersubjective means.
- Heightened co-subjectivity appears to be most commonly brought forth through (i) these instruments’ unique timbral qualities, (ii) melodic means (i.e. rāg), (iii) syncopation (i.e. laykārī), (iv) speed, and (v) micro-temporal asynchrony.
- Heightened intersubjectivity appears to be most commonly brought forth through tihāīs and other overt forms of rhythmic interaction, while mukhrās play a less significant role in this regard.
These recurrent relationships between performers’ interactions and feelings of connectivity may be used to gain a better understanding of what kinds of musical experiences these performers’ value the most, and by extension, find out what it feels like to connect with one’s co-performer in this genre. In the following chapter I make use of these findings to draw further insight regarding the quality of sitar and tabla performers social experiences – particularly those displaying heightened connectivity – at both co-subjective and intersubjective levels of awareness. I also try to determine whether performers in this genre have a preference for connecting at either co-subjective or intersubjective levels of experience, and how this preference relates to the socio-cultural environment within which this music is both learnt and performed.
Chapter Six – A Phenomenological Account of Musical Connectivity in Sitar and Tabla Performance

6.1 Introduction

Based on what we now know about the musical interactions between sitar and tabla performers (Chapters Three and Four), and about the way in which these various contextualized interactions are more or less likely to bring forth feelings of musical connectivity (Chapter Five), I offer a phenomenological account of the social experiences underlying these various musical behaviours. I do so by applying the musical connectivity model developed in Chapter One in order to relate certain kinds of musical interactions with states of either intersubjectivity or co-subjectivity (McGuiness & Overy, 2011), which as we have seen (section 1.4), are distinguished according to level of reflective awareness and understanding of the other’s separate intentional agency. Furthermore, I also explore whether Hindustānī performers place more value in attaining either one of these social states, thereby uncovering what heightened musical connectivity feels like in this particular genre.

Throughout this dissertation I have explored the phenomenon of musical connectivity in terms of how joint music making affects performers’ experienced sense of self and other. However, as we saw in Chapter Five, experiences of musical connectivity were predicated not only on whether performers were pleased with their co-performer’s actions, or on whether they were pleased with the sounds of the
ensemble as a whole, but, more importantly, on whether they were satisfied with their own playing. Recall, for instance, how most disagreements in connectivity ratings seemed to be caused by a performer’s feelings towards the quality of their own musical actions (section 5.5). Or how Sandeep stated that he felt it hard to connect with Shyam because my research made him feel more self-conscious about his playing (p. 170). To me, this implies that the value of these musically-induced social experiences are fundamentally (though not exclusively) determined by how they make performers feel about their own selves, and not only by how they make them feel about, and towards, others.

I would therefore like to begin this chapter by arguing that in order to understand how music affects this self-other relationship, and find out why performers value certain kinds of social experiences over others, we must also consider how musicking affects performers’ sense of selfhood in the first place. As we shall see, this means recognizing that selfhood is an emergent - and therefore somewhat malleable - phenomenon, which can be significantly affected by a person’s sensorimotor engagement in an activity as physically, cognitively, and emotionally demanding such as music. Musical connectivity, I maintain, occurs within this broader phenomenon of self-enactment and transformation, and must be investigated as such.

I begin this phenomenological analysis by considering the extent to which musical interactions in sitar and tabla performance enable and/or require reflective awareness of intentional agency among co-performers (section 6.2). I then refer to the case study’s empirical and ethnographic findings to determine the level of
reflective awareness that might characterize most peak musical experiences, and consequently, find out whether Hindustānī performers have a preference for achieving heightened states of either co- or intersubjectivity (section 6.3). Put differently, I try to determine whether peak experiences of musical connectivity tend to occur at a predominantly co-subjective or intersubjective level of reflective awareness and shared understanding.

The next step consists of reflecting on why it is that performers in this genre place more value on the attainment of certain kinds of psychological states over others (section 6.6), as well as investigating how Hindustānī performers are able to maximize the chances of attaining these particular states (sections 6.4 and 6.5). Throughout this discussion, it will become increasingly apparent that the reason why sitar and tabla performers prefer particular kinds of social experiences is related to how these experiences resonate with their shared cultural and spiritual beliefs of non-duality and self-transcendence (Clarke & Kini, 2011).

Lastly, I try to account for these peak experiences from a philosophical and a psychological perspective by drawing on current theories on self and consciousness (Varela et al., 1991; Damasio, 1999; sections 6.7 and 6.8) in order to explain how joint music making might have such a profound transformative effect on experiences of both self and other. In doing so, I provide a nuanced account of what it feels like to connect with one’s co-performer in the context of live sitar and tabla performance (section 6.9).
6.2 Shared Subjectivity in Sitar and Tabla Performance (Part 1)

As we have seen throughout this dissertation, musical interactions in sitar and tabla performance often display extremely high levels of melodic, rhythmic, and metric complexity. What makes these interactions all the more astounding is that they are almost entirely improvised (admittedly within fairly consistent patterns and shared representations), which means that neither performer knows exactly what he or his co-performer will do next. And yet, performers nevertheless manage not only to remain precisely coordinated, but moreover, to adapt and respond to each other’s spontaneous actions in ways that complement their expressive effect.

As the famous tabla player Us. Zakir Hussein explains, musical interaction in this genre requires not only an understanding of the other performer’s musical intentions, but also of the feelings and emotions guiding these intentions.

> When a musician is performing and I am playing with him, within the first minute or two I have to judge what this musician is feeling at the time, what he is going through, and what he is trying to express through his music, his temperament, his feelings, his emotions... and so in that sense I am almost a psychiatrist. (Hussein, 2000, interview in ‘Face to Face’)

According to McCaleb’s (2014) model of ‘inter-reaction’ described in Chapter One (section 1.3.3), ensemble performers achieve this kind of musical and expressive cohesion by continuously transmitting, inferring, and attuning to each other’s musical intentions. My argument is that - given the highly complex, empathetic, and relatively unpredictable nature of sitar and tabla performance, as well as the marked distinction in roles (see Chapters Three and Five) - interactions in this genre certainly enable, and arguably require, high levels of reflective understanding and awareness among co-performers as separate intentional agents, and that performers’ social
experiences must therefore have a strong intersubjective quality. To clarify this point, one can identify and discuss some of the interactions that are likely to display the kind of recursive understanding required for intersubjectivity to occur.

Cadential patterns (i.e. *mukhrās*, and especially *tihāīs*) are probably the clearest example of musical interactions that are likely to be accompanied by intersubjective experiences. In order to play a *tihāī*, the soloist must have, first of all, a conscious intention to finish his or her phrase on the upcoming *sam* with a cadential effect. He or she must also be aware of his/her location within the *tāl*, and know how long the *tihāī* must be in order to land at the right place. Therefore, playing a *tihāī* tends to require fairly complex calculations and reflective thought. In addition, by playing a *tihāī* the soloist also transmits his or her intention to end the current phrase on the upcoming *sam*, which can be easily inferred by the accompanist. The accompanist can then choose to either play an explicit response to the *tihāī*, or simply recognize and complement the soloist’s *tihāī* verbally and/or gesturally, and in doing so, both reinforce the cadential effect and transmit his or her intentional understanding back to the soloist. Hence, *tihāīs* comply with the need for recursive understanding required for intersubjectivity to take place. Considering how frequently performers play *tihāīs* in the course of performance (see Chapters Four and Five), we may deduce that intersubjectivity is a fairly common quality of social experiences underlying this genre.

Moreover, cadences are by no means the only form of interaction requiring high levels of reflective understanding, as performers may continuously respond to each
other’s actions in numerous other ways involving similar recursive patterns of shared understanding. Probably the most emphatic display of intersubjective interaction occurs during sawāl jawāb (i.e. question and answer) passages, such as the one at the end of Nikhil Banerjee and Zamir Ahmed Khan’s vilambit performance (see Chapter Four). Example 9 in the accompanying DVD consists of an even clearer, and more accurate, instance of sawāl jawāb. This example is extracted from a live performance by renown musicians Us. Shahid Parvez on sitar and Pt. Anindo Chatterjee on tabla, playing rāg Bāgeśrī in 7-beat rūpak tāl.

During this passage, the sitarist plays several melodic phrases that the tabla player must immediately memorize and recreate on his instrument, thereby carrying out a form of musical dialogue, or call-and-response. Doing so requires awareness of the other performer as a separate intentional agent, reflective understanding of his or her intentional behaviour, and the capacity to translate the sounds of one instrument onto an entirely different one. Although this is both an extreme and relatively unusual example of how sitar and tabla performers may bring forth shared states of intersubjectivity, similar though less overt interactions make take place throughout a performance.

Considering how central these and other forms of reflective musical interaction are to sitar and tabla performance, I propose that – in comparison with most others forms of joint music-making - social experiences underlying this genre appear to have a strong intersubjective and communicative component. Put differently, although many other forms of ensemble performance are likely to involve a certain level of
reflection and empathetic attunement, my impression is that the intimate, spontaneous, technically demanding, and highly responsive nature of sitar and tabla performance is likely to emphasise this need for reflective understanding.

Furthermore, given that certain kinds of interactions, such as cadences and imitative passages, may be assumed to involve particularly high levels of reflective understanding, I propose that it is possible to establish – to some extent – the prominence of intersubjective experiences, both within and across performances, according to how frequently performers engage in these kinds of interactions. A performance that has a high density of cadential and/or imitative patterns may be assumed to be permeated by experiences of intersubjectivity. In contrast, a performance with few such instances may lean more towards the co-subjective side of the spectrum.

Based on this same premise I would argue that, since tabla solos are generally less likely to display large amounts of overt rhythmic interaction, they are likewise less likely to be accompanied by intersubjective experiences than sitar solos. In fact, I would argue that there is a fairly consistent directionality to the process of intentional understanding and attunement in sitar and tabla performance. Due to the tabla player’s overriding role as accompanist, and due to there being less overt interaction among performers during tabla solos, it is normally the tabla player who must infer and adapt to the sitarist’s intentions. Although the opposite can - and does - occur, it is a much less prominent flow of musical information. In general, sitarists are less concerned with the tabla player’s musical and expressive intentions, and more
concerned with ensuring that the tabla player is capable of adapting to their own playing. This is why it is quite unlikely that a sitarist will describe his or her musical role in terms similar to those used by Zakir Hussein in the quote above.

6.3 Shared Subjectivity in Sitar and Tabla Performance (Part 2)

In the previous section I argued that – based on the nature of the musical interactions that characterize this genre - sitar and tabla performance would appear to require comparatively high levels of reflective understanding and awareness of self and other as distinct intentional agents, and that therefore, experiences underlying these interactions must have a strong intersubjective component. However, does this mean that performers’ peak musical experiences must therefore be predominantly intersubjective in nature? Or, put differently, does this mean that sitar and tabla performers will experience stronger musical connectivity if they engage in frequent forms of intersubjective interaction? Not necessarily. In fact, as I explain throughout this section, most of my ethnographic and empirical findings point towards the opposite direction. Namely, that although performance in this genre may often involve high levels of reflective awareness, Hindustānī performers may ultimately prefer connecting at a pre-reflective, co-subjective level.

First of all, let us review the case study’s findings, particularly with regards to the relationship between performers’ rhythmic interaction and their self-reported connectivity experiences. On the one hand, these results revealed a general trend for more connected performers to have higher levels of overt rhythmic interaction (in
the form of cadential patterns), thus suggesting that performers’ experiences of musical connectivity may have been related to the frequency with which their interactions brought forth intersubjective states. This empirical finding was further supported by some of the performers’ personal reports. Recall, for instance, Sandeep’s explanation of why he felt more connected with SP1 than SP3 on account of SP1 being very interactive, and SP3 being too passive and unresponsive (p.165). This could imply that performers prefer interacting - and therefore connecting - at an intersubjective level.

However, there were several noticeable exceptions to this trend, indicating that high levels of overt rhythmic interaction may not always be required for, or even conducive to, musical connectivity. For example, both Shyam’s performance with TP2, and Sandeep’s performance with SP2, had some of the largest number of cadences, but were nevertheless rated as having average levels of connectivity. Conversely, Shyam’s performance of rāg Jhiññhoṭī with TP1 had relatively few instances in which cadences triggered an overt reaction from the co-performer, and yet was rated as highly connected. In addition, the analysis also revealed that the number of cadences per performance appeared to be most consistently related to, and very likely determined by, the choice of tāl and lay (i.e. metre and tempo), with faster and shorter metres displaying greater levels of interaction. This last finding made the potential relationship between rhythmic interaction and performers’ connectivity ratings all the less certain, as it may have been caused by the fact – coincidental or not – that performances with higher ratings also happened to be in madhya jhaptāl.
Furthermore, the analysis of Nikhil Banerjee and Zamir Ahmed Khan’s performance in Chapter Four revealed that their level of rhythmic interaction was surprisingly low during most of the *vilambit*. Although both performers played *tihāśis* quite frequently, few of them were accompanied by a clear reaction from the co-performer. And there were hardly any other instances of overt rhythmic interaction (except for the final *sawāl jawāb*-like passage). After considering the possibility that this might be due to ZAK’s shyness or lack of technical skill, I argued it was more likely that ZAK’s rather passive form of accompaniment may have been a conscious decision in order to comply with NB’s *Khyāl* model, as well as to avoid obstructing NB’s melodic expression. In other words, NB and ZAK may have purposefully chosen to downplay their overt rhythmic interactions during most of the *vilambit*, thereby implying a preference for interacting in ways involving little or no reflective awareness. Together, these various findings suggest that high levels of overt interaction may not always be a desirable quality a performance, and that the intensity with which sitar and tabla performers connect may not necessarily be dependent on this issue.

The idea that sitar and tabla performers may prefer to connect at a co-subjective level and may therefore purposefully choose to interact in a pre-reflective manner, was in fact expressed in a rather straight-forward manner by Shyam and Sandeep while watching the video recording of their performance of *rāg Darbārī*. When I asked them to identify their moment of highest connectivity, I myself had two possible passages in mind. The first, which I have already discussed in section 5.5.3 (Example 6), seemed to me to be characterized by emotional depth but relatively low levels of interaction, whereas the second (see Example 10) consisted of a highly
interactive, *sawāl jawāb*-type passage lasting over several cycles. My impression was that the interactive quality of this second moment might outweigh the emotional depth of the first moment. However, both Shyam and Sandeep disagreed.

SD: I think here [Example 10] there wasn’t any connectivity, I just want to give him answer. He is doing some *tīhāī* and coming on the 12, the *mukhrā*, and in between these four beats I want to fill in with something.

AC: But didn’t you feel a kind of sharing during this moment? There is a very close interaction, me, you, me, you. Between this moment and the one I showed you before [Example 6], which one would you say you were more connected?

SD: I think before.

SH: Me too.

SD: Because the other one was more inwards, this one is more outwards. This is like mathematics.

SH: This is more brain and the other is more heart.

According to this conversation, not only can connectivity be brought forth without the need for overt interaction, but furthermore, there may even be instances in which too much reflection – or too much ‘brain’, as Shyam put it – may actually interfere with the ‘heart’, which presumably stands for musical expression. Furthermore, this conversation also suggests that both performers place greater value in achieving introspective, emotionally-charged experiences, over more extroverted and intellectual ones, thus supporting the idea that non-reflective, co-subjective states may ultimately be more desirable than intersubjective ones.

A very similar point was made by Sandeep while describing one of his most memorable musical experiences playing with Shyam:
One time I remember, he [Shyam] was playing sitar and crying. It was in Assam, both of us went there for one performance at an ashram, and there were only a few people, maybe seven or eight people, many sadhus. He was playing rāg Cārukešī and started crying. The ālāp he played that day! I can still remember, I don’t know if he remembers or not. It was really, really, very, very...The sound was like he was in temple serving something to God, expressing his love to God, something like that. And that day when it was my turn to play, I only play āhekā... I feel he is playing with more feeling and if I play something fast it will destroy his feeling. So I just do this [demonstrates undecorated āhekā on tabla]...enough.

Again, this shows that musical connectivity may not necessarily require high levels of interaction; that peak musical experiences may be characterized by low levels of recursive intentional understanding; and furthermore, that performers may sometimes purposefully avoid engaging in overt, reflective interactions in order not to disrupt their co-subjective states. The apparent preference that Hindustānī performers have for co-subjective states was expressed most eloquently and succinctly by one of the tabla players taking part in the case study, who described his experiences of musical connectivity in the following manner:

‘When we connect there is only music’

To me, this statement implies several aspects regarding the phenomenology of musical connectivity in sitar and tabla performance, which happen to resonate with my own peak musical experiences. Firstly, it implies that the performer’s own sense of selfhood is either absent, or at least altered, during peak musical experiences. Secondly, it implies that the performer’s perception of his or her co-performer is likewise absent or altered during such moments. Thirdly, that a performer’s sense of self and other become more entwined, or less distinct, compared to ordinary (i.e.
non-musical) experience. And fourthly, that performers momentarily seem to ‘become’ the activity they are currently engaged in (i.e. music).

In other words, not only does this statement clearly encapsulate the notion that experiences of musical connectivity in sitar and tabla performance may involve little or no reflective awareness of self and other as distinct intentional agents, and that musical connectivity may therefore be characterized as co-subjective. In addition, it also suggests that - at its peak – musical performance can have a transformative effect on a performer’s sense of selfhood, to the point that a performer’s sense of self may appear to be momentarily transcended, and that musical connectivity occurs within this broader phenomenon.

I return to this idea towards the end of this chapter. But before doing so, there is paradox to discuss: Why would sitar and tabla performers prefer to connect at a co-subjective level, having the chance – indeed, almost the necessity (given the aforementioned complexity, spontaneity, and empathic responsiveness) - to interact and connect at an intersubjective level? In other words, why is it that Hindustānī performers seem to value the attainment of co-subjective states over intersubjective ones, and how do they manage to achieve this within a genre that tends to require high levels of reflective understanding?

6.4 Achieving Heightened Co-Subjective States

I begin by considering the latter of these questions: how do sitar and tabla performers bring forth such states of heightened co-subjectivity? Based on the evidence
discussed in the previous section, it would appear that the simplest way in which sitar
and tabla performers do so is by reducing the levels of overt rhythmic interaction,
thereby reducing the need to consciously reflect on each other’s musical intentions.
This is precisely how Sandeep described his approach towards accompanying Shyam
during what he experienced as a highly expressive and connected performance
(p.254). Likewise, the moment of highest connectivity in Shyam and Sandeep’s
performance of rāg Darbārī displayed relatively low levels of interaction in favour of
musical expression (p.253). In addition, I have also suggested that this may be the
reason why Zamir Ahmed Khan kept his accompaniment of Nikhil Banerjee rather
sparse and non-interactive during most of their vilambit performance.

However, simply maintaining overt forms of rhythmic interaction to a minimum does
not in itself guarantee the attainment of heightened states of co-subjectivity. All this
does is avoid reflective, intersubjective levels of experience from becoming too
prominent, and thereby interfering with these non-reflective states. In order to
achieve heightened co-subjective states performers must also maximize the social
and expressive effects of interactions involving little or no reflective awareness. As I
explained in Chapter One (section 1.4), co-subjective interactions are normally
grounded in processes of attentional entrainment, emotional contagion, and bodily
resonance, none of which require conscious understanding of the other person’s
intentions.

Interestingly, most passages identified as moments of heightened connectivity
throughout the case study were characterized precisely by an emphasis on these non-
reflective, bodily processes. For instance, the two kinds of passages that were most commonly reported by performers as generating connectivity throughout this study were either laykārī sections or the opening stages of the slow vilambit section. As I explained in section 5.5.3, due to the high levels of syncopation, laykārī sections require performers to exert greater attentional effort in order to ensure they remain coordinated within tāl. Thus, one of the reasons why laykārī sections appear to produce states of heightened connectivity may be largely due to the effort required in maintaining interpersonal entrainment.

Similarly, the main reason why I believe slow vilambit passages were often associated with connective experiences is because the slow tempo allows sitarists to express the rāg’s character more freely, which in turn creates states of shared affect and emotional contagion. Also, the reason why the jhālā section was identified as the moment of heightened connectivity in the performance of rāg Yaman by SP2 and Sandeep is probably because of the physical and emotional excitement that is generated by having both performers play at such exceedingly high speed. Therefore, all of these various passages may have been accompanied by high levels of connectivity on account of non-reflective, attentional and bodily processes.

In this respect, it is also worth recalling the rather unexpected findings from the micro-temporal analyses in Chapters Four and Five, indicating that both more connected and more proficient performers may tend to play in a less synchronized and coupled manner. This, I argued, may be due to the fact that micro-temporal asynchronies can contribute towards musical expressivity when used in an
appropriate manner (see section 5.6.3). Since, as I explained in Chapter Four, micro-
temporal interactions lie largely beneath reflective awareness and agentive control,
the use of micro-temporal asynchronies may therefore be another way in which sitar
and tabla performers manage to maximize the social and expressive effects of their
musical interactions at a pre-reflective level of consciousness, thus causing
heightened states of co-subjectivity.

In addition, another aspect of musical performance which by most accounts plays a
fundamental role in promoting heightened states of connectivity at a core, co-
subjective level of consciousness is the quality of the sound itself. One of the most
notorious qualities of sitar and tabla performance is the rich, exuberant sound these
instruments produce, which, combined with the continuous drone often sounding in
the background, create a sonic environment which is highly expressive, aesthetically
pleasing, and unlike anything one would normally hear in a non-musical scenario. As
Clayton (2005) points out, ‘raw’ sound is one of the most important levels in which
communication between performers and listeners takes place. I would add to this
that ‘raw’ sound is also the foundation upon which performers connect, as
performers need to be pleased – and ideally enthralled - by their instruments’ sounds
in order to have rewarding musical experiences. For example, we have just seen that
the main reason why Sandeep stated he was so moved by Shyam’s ashram
performance was because of his sound, which was like ‘expressing his love to God’
(p.254).
In order for performers to connect as a result of the pleasure derived from these sounds, several highly variable factors need to be working in their favour. These include: (i) the instrument’s sound quality (which may vary both according to weather conditions and the condition of their various parts (strings, bridge, etc.)); (ii) tuning (as I already mentioned, these instruments may go easily out of tune) (iii) skill and technique, (lack of skill or practice is likely to impinge on an instrument’s sound quality); and (iv) the sound system’s quality (unfortunately Hindustānī performances suffer all too often from poor amplification). It is precisely because of how variable these factors are, that when instruments are sounding just right they are likely to promote feelings of musical connectivity.

In short, I am arguing that one of the ways in which heightened co-subjective states are normally attained is by the avoidance of reflective forms of musical interaction combined with the effective enactment of non-reflective qualities of musical performance. These include, (i) the instruments’ tonal qualities; (ii) the use of micro-temporal asynchronies for expressive effect; (iii) the expressive execution of a rāg’s gestural and emotional character, particularly during slow portions of performance; (iv) increase in interpersonal attention caused by syncopation; and (v) joint technical display, particularly in the form of high speeds. However, this does not fully explain how Hindustānī performers achieve heightened co-subjective states within a genre that, as I argued, demands that performers continuously create novel, spontaneous musical sounds, and both adapt and respond to their actions in a coordinated and empathetic manner. In the following section I consider other ways in which sitar and tabla performers may achieve this.
6.5 Musical Automaticity, Agency, and Reflection

I now propose that another way in which Indian performers manage to achieve these heightened co-subjective states within a genre which not only allows for, but would also appear to require, high levels of reflective awareness, is by learning how to carry out complex musical behaviour without the need for conscious reflection. Highly skilful, as well as highly attuned, performers are able to carry out interactions that would appear to require reflective awareness, in a ‘quasi-automatic’ manner, without much need for reflection. Throughout this discussion, I explain how this process may result in non-agentive states of musical creativity – that is, states in which performers no longer perceive themselves as being the main intentional agents behind their own actions - which may thus have not only an effect on performers’ social experiences, but also on how they experience their own selfhood.

6.5.1 Improvisation and the Automatization of Musical Behaviour

In his study on improvisation, Berkowitz (2010) reports on the consistency with which musicians describe their experiences of improvisation in terms invoking a certain lack of agentive control. That is, as witnesses to the creative process which they are nevertheless physically carrying out, feeling as though the music plays them rather than the other way around. For example, he quotes the famous 19th century pianist Carl Czerny’s treaties on improvisation, where he advised his students that: ‘reflection and attention are of scarcely any service in the matter. We must leave nearly everything to the fingers and to chance’ (2010, p. 121); a notion which is
surprisingly similar - given the cultural and temporal gap – to sitarist Us. Vilayat Khan’s pedagogical instruction to his son Shujaat Khan, that: ‘where the hand is moving should not be decided by you’ (in Neuman, 2012, p. 438).

According to Berkowitz, the notion of the improviser as both creator and witness are ‘seemingly near-universal characterization of the experience of improvisation across cultures’ (2010, p. 130). As we shall see, this is certainly true for Hindustānī music (Slawek, 1998; Neuman, 2012). Berkowitz describes this phenomenon in the following manner:

The improviser as “creator” may begin with an idea, but as soon as the idea passes through the hands, the fingers may lead spontaneously and subconsciously to another element of the knowledge base. This subconscious transition to new material may seem to be merely “witnessed” by the performer, who responds to where he or she then arrives, steering the “bobsled” again (to use Levin’s term) as “creator”. Thus, a constantly evolving dialogue emerges between the initiation of the musical flow and the response to it. (2010, p. 130)

In this passage, and indeed throughout his book, Berkowitz argues that the phenomenon of ‘improviser as witness’ is due to the inherently embodied and procedural nature of musical knowledge (i.e. know how). Unlike explicit/declarative knowledge (i.e. know that), implicit/procedural knowledge – involved in activities such as walking, talking, brushing one’s teeth, and potentially, playing an instrument - can eventually be executed without the need of conscious monitoring or reflection, thus becoming quasi-automatic.

The...feeling of automaticity...can be simply viewed as a natural result of considerable practice, a stage at which it has become possible to completely dispense with conscious monitoring of motor programmes, so that the hands appear to have a life of their own. (Pressing 1988; in Berkowitz, 2010, p. 130)
In other words, through the acquisition of musical skills, performers can acquire the capacity to carry out complex musical actions without the need for conscious reflection. By allowing the pre-reflective body to carry out musical actions without interference from the conscious mind, performers may undermine the feeling of agentive control over their actions, thereby feeling as witnesses to their own musical actions. Furthermore, since this quasi-automatic process may result in musical ideas that are perceived as highly expressive and innovative – often more so than those actions which are under strict agentive control - performers may naturally redirect their own lack of agency by attributing their actions to some other, often higher, entity (an idea I shall explore further in the following sections).

This phenomenon can be clarified further by reference to Shaun Gallagher’s (2005) distinction between what he describes as feelings of ‘ownership’ and feelings of ‘agency’. In short, he argues that a person’s subjective feeling of ownership with respect to an action results from ‘a post-factum sensory-feedback match occurring subsequent to the action’ (2005, p. 190), whereas agency ‘is generated in a control function (the forward model) that anticipates action’ (idem). This means that, from a first-person perspective, the feeling of agency may depend on the extent to which one anticipates any given action. If a musical action is planned and therefore expected by a performer, he or she will likely experience him/herself as the agent behind it. If however, that action is not anticipated by the performer, he or she may simply experience ownership over the action (as it is still being produced by his or her own body) without a sense of agentive control.
To summarize, non-agentive states seem to be a common quality of many improvisational genres, including Hindustānī music. These states might be achieved by allowing the pre-reflective body to carry out musical actions in a quasi-automatic manner, without guidance from the reflective mind. This makes it harder for the conscious mind to anticipate future musical events, which in turn may cause the performer to witness him or herself as the merely the owner, rather than the agent, of the action. The capacity to carry out complex, spontaneous musical actions without the need for reflective planning, may explain how sitar and tabla performers manage to attain co-subjective states, regardless of the technical and cognitive demands imposed by this genre.

6.5.2 Pedagogical Approaches for the Automatization of Musical Behaviour

The capacity for North Indian performers to attain such quasi-automatic, non-agentive states of creativity seems to be purposefully nurtured through the specific pedagogical processes of tālim and riyaz. The term tālim refers to the process whereby a master musician, or guru, imparts musical knowledge on his student, of shishya. The term riyaz refers to the regular, disciplined, and highly demanding practice through which the student attempts to absorb, and eventually embody, the guru’s imparted musical knowledge. As Daniel Neuman describes it, riyaz ‘is not only a preparation for performance, but also a preparation for an unattainable perfection’ (1980, p. 34).
My guru’s method (representative of how most sitar guru’s traditionally teach) consisted, first of all, in teaching me a number relatively simple exercises designed to develop basic techniques, and secondly, in teaching me several gats (i.e. compositions) and tans (i.e. improvisations) according to whichever rāg we would be currently working on. However, the most important aspect of our lessons would begin once I already acquired this basic technical skills and musical understanding. At this stage, his method would consist of him playing an entire performance (or an entire section of a performance) over the course of an hour or so, with me trying my best to imitate what he did, and occasionally asking me to take an improvisation of my own based on his previous improvisation. To illustrate this, I have included a video extract (Example 11) consisting of the first few minutes of a lesson in rāg Basant Mukharī, where one can see Debashish play an ālāp seemingly as he would in actual performance, an where you can hear me in the background trying to keep up.

Throughout these lessons, Debashish would keep explicit, verbal instructions to a bare minimum. In doing so, he encouraged me to develop an embodied, pre-reflective approach to musical improvisation – or as Debashish would often describe it, a ‘totally free mind’. This same idea was reportedly expressed more forcefully by Us. Vilayat Khan, whilst teaching his son Shujaat Khan, who at one point asked his father to clarify what rāg they were working on. Vilayat Khan’s response was:

Again you are asking me?! Thinking? Thinking! I told you not to think! None of your business. Just play! (in Neuman, 2012, p. 435)

As Dard Neuman explains, the combined practices of tālim and riyaz ‘equip the body-instrument (the throat or galā and the hands or hath) to first explore automatically
and then explore autonomously, independent of a directing mind’ (2012, p. 426), thus fostering the attainment of quasi-automatic, non-agentive approaches to musical creativity. Furthermore, in doing so, they may also redirect this apparent lack of agentive control towards other entities, thus blurring the distinction between self and non-self. This, for instance, seems to be the case for Pt. Ravi Shankar, who speaks of how during creative peaks:

His sitar is no longer an external medium for producing music, but a fused part of his body, and the act of creating music is more a release of inner energy than an activity requiring conscious effort. (Slawek, 1998, p. 339)

Moreover, as a result of the intense pedagogical processes of tālīm and riyaz, performers may also transfer their sense of musical agency onto their guru, as if their guru would be playing through them. As Rahaim (2012) points out, this is accompanied, and indeed supported by, an embodied imitation of the guru’s actual behaviour. Thus, Rahaim notes that entire gharānās can be recognized simply on account of the supporting gestures that accompany musical performance. By acting in a pre-reflective, quasi-automatic manner, performers allow their bodies to act in imitation of their guru, which is why the concomitant lack of agency can be naturally redirected towards him or her.

6.5.3 Rāg as Musical Agent

This feeling of union between the performer and an external entity, and of bestowing some sense of agentive control onto such external entity, also seems to characterize the soloist’s relation to whichever rāg he or she is performing. As I explained in
Chapter Three, rāgs are normally experienced both by performers and listeners as imaginary entities with distinct musical and expressive qualities, and capable of inducing particular moods and images (see Bor, 1999; Clayton, 2005; Leante, 2009). The fact that rāgs are perceived somewhat like actual beings, creates as sense of ambiguity as to whether musical expression is emanating from the sitarist or the rāg itself (a clear example of what Sloboda (2005) refers to as ‘emotional cue-impoverishment’, see section 1.3.1).

For instance, according to Clayton, the renowned Khyāl singer Veena Sahasrabuddhe ‘sees the principal agent as being the raga itself, and... places the character of the raga before her own personality when she performs’ (2005, p. 373). A similar thought was expressed by my guru, who explained that:

> It is not that I have to make my mood in a certain way, but the feeling of the rāga is changing your mood. When I start Bāgeśrī then the scale gives me the mood, because the sound is giving to you, you are not giving to the sound. Then your mood slowly, slowly starts to change and then you put your mood inside this rāga. And then when you play Mālkauns, the mood is deep but you are a normal person, but when you play this rāga you automatically become very serious. By the melody you are getting serious and then with this seriousness you put all of your deepness inside of your playing.

This statement puts in evidence the complex agentive relationship between sitarist and rāg. Although the sitarist chooses what rāg to play, once this choice is made affect no longer seems to emanate from the sitarist, but rather from the rāg as a separate autonomous agent, with its own specific mood and character. It is the rāg that impacts on the performer’s mood, and the performer who must put his or her own personality momentarily aside in order to allow the rāg to express itself.
In sum, since the ‘quasi-automatic’ approach towards musical creativity described above may cause the performer to experience a lack of agency, he or she may redirect that agency towards some other entity, usually the hands, instrument, or guru (Slawek, 1998; Neuman, 2012). Moreover, the concept of rāg – which is so unique and central to Indian classical music – seems to be particularly effective at promoting this agentive ambiguity, and may possibly have developed in this manner precisely in order to bring forth these de-subjectified states (see section 6.6 below).

6.5.4 Group Agency in Ensemble Performance

Although the attainment of quasi-automatic patterns of behaviour can be achieved throughout all kinds of human action, one of the things that makes music special in this regard is that these states can be achieved co-jointly, as a group. When this happens, performers not only carry out complex actions without the need for reflective thought, but in addition, may also respond to their co-performers’ equally automatic behaviour without the need for conscious reflection on his or her co-performers’ actions and intentions. When this happens, performers become capable of carrying out complex interactions without the need for reflection, thus maintaining co-subjective states of shared subjectivity.

Furthermore, this may also result in the emergence of a phenomenon referred to as group agency, whereby the ensemble may appear to manifest its own intentionality, separate from that of its individual members. As Pettit and Schweikard explain, ‘group agency is a theory about a certain domain of joint action’ (2006, p. 35) which
is defined by the emergence of ‘a novel centre of intentional attitude and action’ (idem, p. 30) with a ‘distinct intentional profile from the profile of their [the group’s] members’ (idem, p. 33). In the case of ensemble performance, performers may become so attuned and effective at responding to each other, that they may come to feel that neither one of them is entirely in control of the performance’s direction. Rather, performers may feel as though the music ‘plays itself’; as if it has a mind of its own which deciding which course to take, without the agentive control of any individual performer. According to McCaleb, 

The illusion of the music taking over the group may arise when musicians are so attuned to one another and the emergent performance that interpretive intentions become cognitively distanced from individual musicians...The creation of the ensemble’s interpretation is distributed to such an extent that it may feel like the musicians are tapping into something greater than their individual musical intentions and acting as a unified whole...Thus, inter-reaction may encourage the development of an ensemble flow state as well as a social sameness between performers. (McCaleb, 2014, p. 101)

While previously we discussed how an individual performer may experience a removed sense of agency with regards to musical creativity and expressivity, McCaleb’s theory of inter-reaction explains how the same may occur at a group level. His explanation is essentially the same as Berkowitz’s (2010): the inherently embodied and procedural nature of musical performance may enable a certain degree of automaticity to take over the performers’ creative and expressive decisions, and this automaticity, or agentive distance, can be further removed when creativity becomes distributed among several, highly attuned performers. The fact that performers may not anticipate their performers’ actions, and therefore their
own inter-reactions, may - according to Gallagher’s (2005) theory - contribute to a sense of ownership without agency at a group level.

In summary, although sitar and tabla performance would appear to require high levels of reflective understanding of self and other as distinct intentional agents, there are various ways in which performers either undermine or overcome this requirement in order to achieve heightened states of co-subjectivity. On the one hand, they can achieve this by simply lowering the frequency and prominence of overt, reflective interactions, while simultaneously maximizing the effect of pre-reflective interactions. On the other hand, I propose that highly skillful performers can carry out complex, spontaneous, and responsive interactions without much need for conscious reflection and planning, by developing a ‘quasi-automatic’ approach towards musical creativity (Berkowitz, 2010; McCaleb, 2014). Moreover, these states appear to be particularly nurtured in Hindustānī music through the pedagogical practices of tālim and riyaz (Neuman, 2012), as well as by means of the musical concept of rāg (Clayton, 2005). All of this may result in non-agentive states, thus blurring the distinction between self and non-self.

6.6 Worldly Enjoyment and Spiritual Transcendence

The previous section explored various ways in which sitar and tabla performers may manage to connect at a co-subjective level within a genre that – given its complexity, spontaneity and responsiveness – would appear to require high levels of reflective thinking. In doing so, we also realized that several of the ways in which performers
achieved this was through quasi-automatic approaches towards musical creativity and expression. As we saw, Hindustānī performers tend to describe their peak musical experiences not only in co-subjective terms, but more significantly, in non-agentive ones (Neuman, 2012; Clayton, 2005). Musical creativity and expression are felt – at their best – as if emanating from an entity which is somewhat separate from the performer. Musical agency may be ascribed to the hands, the instrument, the guru, the rāg, or some other entity. In any event, the source of musical creativity seems to lie somewhere beyond the performer’s agentive control. This sense of agentive displacement - and by extension, of self-transformation, expansion, and/or transcendence - is precisely what makes these peak experiences so powerful and special. This might also be one of the main reasons why performers prefer connecting co-subjectively.

In this section I propose that Hindustānī musicians may be particularly prone to value and nurture co-subjective levels of musical connectivity because of the way in which these experiences resonate with certain notions of non-duality pervasive throughout Indian culture. In other words, I believe that the answer to the question of why these performers prefer to connect at a co-subjective level lies not only on the effect these interactions have at a social level, but more fundamentally, on how they affect performers’ experiences with regards to their own personal self, and more specifically, in terms of their felt sense of self-transcendence.

Needless to say, India is a land of intense spiritual beliefs and aspirations, many of which can be traced back to ancient history, and which yet continue to play a
fundamental role in contemporary society (Doniger, 2009). This is certainly true for classical music. Although musicians are now required to compete in the economic market by entertaining their paying audiences, they are nevertheless very prone to define their occupation in non-materialistic, spiritual terms (Neuman, 1980). Hindustānī musicians are also likely to trace their music’s roots back to spiritual practices such as Vedic chant, ancient theatre, and more recently, Sufism (see Rowell, 1992; Becker, 2004), all of which place great emphasis on transcending normal states of selfhood. They are also likely to emphasise the concept of Nāda Brahma – which essentially means ‘God is Sound’ – and which therefore justifies the notion of music as a spiritual practice (Rowell, 1992; Clarke & Kini, 2011). These origins, combined with the culture within which this music continues to be embedded, has a profound effect on performers’ beliefs and behaviours, and by extension, on the personal and social experiences they value most.

As Clarke and Kini state, ‘it is an anthropological fact that those involved in Indian classical music (as performers or listeners) will tend to relate their deepest experience of it to a spiritually informed worldview’ (2011, p. 138). For instance, these authors found that many Dhrupad singers and listeners described their most intense listening experiences in terms of inwardness, deep concentration, meditation, and praise (i.e. sādhanā, upāsanā), as well as a sense of overcoming the duality between subject and object, or self and world. As we have seen, Sandeep chose a very similar way of describing one of his most memorable performances with Shyam, in front of a small group of sadhus in Assam, as kind of ‘prayer to God’ (p.254). In fact, this is how Hindustānī performers typically describe their peak musical
experiences, and how they thereby attribute spiritual value to what they do. Another classic example of this kind of narrative can be found in Ravi Shankar’s (1970) autobiographical book, where he explains that:

Our tradition teaches us that sound is God – Nada Brahma. That is, musical sound and the musical experience are steps to the realization of the self. We view music as a kind of spiritual discipline that raises one’s inner being to divine peacefulness and bliss...Thus, through music, one can reach God. (1970, p. 17)

I should clarify that I certainly do not intend to affirm or reject the ontological or metaphysical validity of this and similar statements, but rather assert their phenomenological insight. Though performers are obviously biased towards describing their musical experiences in such terms - as it bestows them with a spiritual aura which is generally valued in Indian culture - this does not exclude the possibility that such descriptions capture a real phenomenological quality of their heightened musical experience. In this respect, I agree once more with Clarke and Kini, who make the following argument:

We do not assert that every Indian classical music performance is marked throughout by a state of transcendental consciousness on the part of performers and audiences – more often, the modes of enjoyment are quite worldly, in the vein of desi [i.e. regional, non-classical] traditions. Yet a fundamental motivation for all involved remains the possibility of momentarily touching a higher state of consciousness... One of our points is that the performance situation just described [Dhrupad ālāp] both symbolizes a culture’s metaphysically informed construction of a higher-order consciousness and (at its peak moments) realizes it. This is to imply that, on some level, these experiences are real: they make a claim to truth. (2011, p. 151)

In addition to agreeing with Clarke and Kini, I would also like to build on what they say by proposing that the contrast these authors identify between spiritual
realization and worldly enjoyment (which is a common topic of discussion among North Indian performers), may be roughly equated to the contrast between co-subjectivity and intersubjectivity explored throughout this dissertation. In other words, I propose that intersubjective interactions tend to be interpreted and felt in the form of worldly enjoyment, whereas co-subjective interactions can be interpreted and felt – at their best - in the form of spiritual realization and self-transcendence.

The fact that intersubjectivity is defined by reflective awareness of self and other as distinct intentional agents implies that interactions such as tihāis, sawāl jawāb-like passages, and other complex forms of rhythmic interaction, are likely to negate the possibility of these idealized states of self-transcendence. However, due to the highly intellectual, communicative, and skillful nature of these interactions, they often cause overt excitement among participants; or as Clark and Kini put it, worldly enjoyment. In contrast, although not every kind of co-subjective experience will necessarily be felt in terms of spiritual realization (co-subjectivity may often be very plain and banal), the lack of awareness of the other’s separate intentional agency, combined with the concomitant diminishment or displacement of personal agency, and therefore, the overall lack of distinction between self, other, and world, are likely to resonate with spiritual notions of inwardness and non-duality.

My point is that although sitar and tabla performers are likely to enjoy connecting both at co-subjective and intersubjective levels, the first can potentially be associated with feelings of spiritual realization and self-transcendence, while the
second is more likely to result in feelings of worldly enjoyment. Or, as Sandeep described it, the first is more ‘inwards’ and the second more ‘outwards’ (p.228). Thus, I propose that one of the main reasons why Hindustānī performers may ultimately place more value in attaining heightened states of co-subjectivity may be due to the way in which these experiences resonate with their shared cultural beliefs. Hindustānī music provides performers with ample opportunities to connect at both co-subjective and intersubjective levels, which they may then choose to enact according to personal predisposition, mood, and social context, among other factors. However, is music really capable of bringing forth these spiritual states of self-transcendence? And if so, how? In the final sections of this chapter I will explore in more detail how might joint music making have a profound, transformative effect on performers’ sense of selfhood, and how this affects performers’ concomitant experiences of musical connectivity. In doing so, I will then be able to provide a nuanced phenomenological account of what it feels like to connect with one’s co-performer in this genre. It is worth noting that the ideas presented in this final section are largely inspired by the work of Judith Becker (2004), who carried out a similar investigation on musical states of self-transcendence and transformation based on numerous trance-inducing musical genres.

6.7 Musicking Selves
How can peak musical experiences be related to - and moreover, be felt as the momentary realization of - idealized states of self-transcendence? In order to answer
this question, we must begin by addressing and attempting to clarify the complex concept of selfhood. Western thought has been characterized for centuries by the idea of self ‘as a bounded, unique, more or less integrated motivational and cognitive universe... organized into a distinctive whole and set contrastively both against other such wholes and against its social and natural background’ (Geertz, 1983; in Becker, 2004, p. 89). A self which, in other words, perceives and interacts with the world, but is not significantly – i.e. constitutively - affected by it. From this perspective, the idea of music having a transformative effect on performers’ sense of self would appear impossible.

And yet, as natural and intuitive as this view might seem to most of us, anthropologists are well aware that this view of self as an independent and immutable entity is ultimately a cultural construct, and one which is by no means ubiquitous (Becker, 2004). Even in the West, this understanding of personhood is only a few centuries old, the origins of which lie in the Enlightenment, and particularly in Descartes’ famous separation between res cogitans and res extensa, or mind and body. Since the latter part of the twentieth century, both philosophers and cognitive psychologists have departed from this dualistic paradigm by drawing attention at how cognitive processes are dynamically distributed across the whole body of the organism and the environment (Maturana & Varela, 1987; Varela et al., 1991). Due to this shift in perspective, several philosophers and cognitive psychologists have arrived at the conclusion that:

The Cartesian tradition is mistaken in supposing that the mind is an inner entity of any kind, whether mind-stuff, brain states, or
whatever. Ontologically, mind is much more a matter of what we do within environmental and social possibilities and bounds. Twentieth-century anti-Cartesianism thus draws much of mind out, and in particular outside the skull. (van Gelder, 1995; in Schiavio & Høffding, 2015, p. 5)

Locating cognition in the organism’s embodied sensorimotor interaction with its environment blurs any clear boundary between both mind and body, and by extension, self and world. In contrast to the Cartesian view, this embodied perspective posits a self which is intrinsically entwined with the world – a ‘Being-in-the-World’ as Heidegger put it. Rather than there being an independent self which perceives and creates internal cognitive representations of an independent world, both self and world are ‘enacted’ (Varela et al, 1991), or brought forth, through a continuous process of ‘structural coupling’ (Maturana & Varela, 1987). As Merleau-Ponty explained over half a century ago:

The world is inseparable from the subject, but from a subject which is nothing but a project of the world, and the subject is inseparable from the world, but from a world which the subject itself projects. (Merleau-Ponty; in Varela et al., 1991, p. 4)

This modern notion of an embodied and enactive self – defined by ‘what we do within environmental and social possibilities and bounds’ (Schiavio & Høffding, 2015, p. 5) - allows for the possibility that absorbed engagement in a certain activity, such as musical performance, may have a radical effect on who we are, or how we experience selfhood, at that time. The body plays a fundamental role in this process, as it consists of what Varela, Thompson, and Rosch describe as the ‘milieu of cognitive mechanisms’ (1991, p. xvi), as well as the site of first-person experience, emotion, and inner life. In other words, we think, act, and feel through the body, and as Damasio (1999) argues, acquire self-awareness through it.
According to this perspective, whatever action our body is currently engaged in will shape our sense of selfhood at that time, particularly an activity as physically, cognitively, and emotionally engaging as musicking. For example, Rahaim (2012) has carried out a detailed analysis of the link between embodied behaviour, musical creativity, and both personal and social identity in North Indian *Khyāl* performance. In the following passage, he vividly describes how North Indian vocalists’ entire physical behaviour seems to transform the moment they walk on stage, as if adopting an entirely new personality.

The special quality of a body in music is easiest to see when it comes alive at the beginning of a performance. When a singer begins to sing – confidently adopting a familiar posture, forming her jaw and tongue into resonant shapes, tracing melody in the air with her hands – it is as though... some entirely different person has replaced the person who was there a moment before.

The musicking body may seem to disappear while chatting on a train or riding a bike, but it springs to life again in concerts, in practice, and in lessons. (Rahaim, 2012, p. 2)

Musicking bodies are inherently social, and for several reasons. First of all, they are the vehicle through which performers interact and communicate with both the audience and their co-performers. This is true not only in the sense that musical sounds need to be executed through some kind of physical action, but also in that the accompanying gestures and overall physical behaviour contribute significantly to musical expression and meaning (see Leante, 2009). In addition, musicking bodies are also the medium through which performers enact their specific social role as professional musicians.
The change in physical behaviour described in the quote above marks the transition in which the social role of the musician – and therefore his or her musicking self-identity - is reasserted; a role which is both immediately felt from the musician’s own first person perspective, and recognized by others observing and taking part in same activity. The reason why others may easily recognize a musician simply through his or her physical behaviour is at least partly due to the fact that most of these behaviours are rather generic and common to all musicians. This implies that both the social roles and the behaviours through which these social roles are enacted already exist in his or her social environment, and therefore precede the individual. As Becker explains:

Notions of personhood do not reside in the mind as abstract entities, as disembodied, contextless images. They are imagined as situated within certain cultural narratives. We project ourselves imaginatively within a situation, acting in a particular way, responding verbally and gesturally to specific events and particular people. These imaginary narratives are, in broad outline, already present in the society into which we are born. Our subjectivity, our subjective positions, our sense of personhood necessarily develops within cultural narratives that are preexistent. (Becker, 2004, p. 88)

In the case of Hindustānī musicians, this pre-existent cultural narrative of what a professional performer should be like is shaped to a great extent by the guru-shishya (i.e. teacher-student) relationship. In order to become a professional musician, the student must spend countless hours learning from a guru through a process which, as we have seen, consists largely of mimicking the guru’s musical and non-musical actions. As Neuman explains, ‘the guru communicates something of his being, and this must remain true and immutable’ (Neuman 1990; in Rahaim, 2012, p. 125). As a result, the student not only learns how to sing or play an instrument in the style of his or her guru, but also learns – in a rather unconscious manner – how to move,
gesture, behave, and ultimately, be like his or her guru, whilst also allowing some scope for personal identity.

The distinct sense of self that emerges through musical performance may help account for Indian performers’ reported sense of self-transcendence during peak musical experiences. During these peak experiences – and to a lesser extent, throughout any instance of musical performance – performers may momentarily put aside their quotidian (i.e. non-musical) sense of self and replace it with what may be referred to as a musicking self (Becker, 2004); that is, a sense of self that is fundamentally defined and sustained by the current musical activity. Occasionally, this break from one’s quotidian self may be so powerful and complete, that a performer may momentarily feel as though he or she has overcome his/her personal identity, and momentarily touched a higher level of being. This might be particularly true for Hindustānī performers, who are embedded within a socio-cultural environment that nurtures the attainment of such states (Neuman, 2012; Clarke & Kini, 2011).

6.8 Core and Autobiographical Self

Having argued that, from an embodied and enactive perspective, music can have a profound effect on a performer’s sense of selfhood, we must now consider in what ways does a performer’s musicking self differ from his quotidian, non-musical self, in a way which may – presumably – further contribute towards feelings of self-transcendence. In addition, we must also try to clarify how this broad shift in self-
identity relate to the more transient effect on performers’ experienced sense of self and other determined by their ongoing musical interactions (which has been the main focus of this research). I propose to explore and attempt to answer these questions by reference to Damasio’s (1999) compelling and highly influential theory on the biological roots of both human and non-human consciousness, introduced in Chapter One (section 1.5).

As we have seen, Damasio’s theory is based on the distinction between two types of consciousness, which he refers to as core and extended consciousness. In short, core consciousness is pre-reflective, confined to present awareness, and grounded on embodied sensation, feeling, and emotion. Extended consciousness, in contrast, is reflective, language-based, and defined by long-term memory and planning. Since, as Damasio explains, consciousness always involves some degree of self-awareness, these two levels of consciousness correspond to two kinds of self, which he refers to as a core self and an autobiographical self. The distinction between core and extended consciousness, and between core and autobiographical self, will thus allow us to explore in more detail how musicking affects performers’ experience of selfhood in various ways, as well as integrate musician’s immediate, fluctuating experiences of self and other with more enduring feelings of personal identity.

Let us consider how might musicking affect performers’ sense of selfhood at core and extended levels of consciousness. Given that core consciousness is defined by immediate perceptual awareness and embodied feeling, we may presume that a performer’s musicking core self will be entirely different to his or her non-musical
core self simply on account that the performer’s present experience is constituted by musical sounds and actions, as well as by the various bodily and affective feelings accompanying them. In other words, while musicking, a performer’s psychological present is fundamentally defined by the ongoing musical activity, and hence his core self becomes engulfed by the various sounds, actions, and feelings occurring at every present moment. This, of course, depends somewhat on the extent to which the performer is actually directing his or her attention towards the ongoing musical sounds and actions, and away from non-musical objects (whether physical, such as other events happening in the surrounding, or imaginary, such as a thought or memory).

At the same time, a performer’s sense of self while musicking is also projected beyond the present moment, drawing from past experiences and projecting future eventualities, both within and beyond the scope of the performance itself. Thus, musicking may affect a performer’s sense of self at an extended level of consciousness by triggering an *autobiographical musicking self*, defined by long-term memories, plans, thoughts, and values, particularly those that may contribute towards a successful performance. Although this musical identity may always be an important part of the performer’s autobiographical narrative, it comes most strongly to life during actual performance, momentarily superseding other social roles that person may also identify with – such as father, son, husband, friend, neighbour, etcetera. Again, the extent to which the performer fully embraces his current role as a musician will determine the extent to which his autobiographical sense of self will be affected by the musical activity.
In short, we can postulate that music affects performers’ sense of selfhood at a core level of consciousness on account of the various fleeting sounds, actions, and interactions that constitute present awareness, and at an extended level of consciousness on account of the various memories, thoughts, and plans projected beyond each present moment. Performers’ physical transformation upon stepping on stage, as reported by Rahaim (2012) in the quote above (p.277), reflects both of these processes: their distinctly musical behaviour results from the projection of their autobiographical self onto a pre-existent social narrative (Becker, 2004) acquired through musical pedagogy (Neuman, 2012), which in turn allows them to fully enact and embrace their musicking self at a core level of consciousness. Thus, both of these processes contribute towards the emergence of a musicking self, and therefore to feelings of self-transcendence.

6.9 ‘There is Only Music’

Now, let us consider how the idea of core and extended musical consciousness and selfhood applies to the particular case of sitar and tabla performance, and how it relates to the central discussion regarding the various states of shared subjectivity brought forth through joint music making in this genre. In other words, I now propose to discuss how might Hindustānī performers come to experience selfhood on core and extended levels of consciousness in light of the various evidence presented and discussed throughout this dissertation. In doing so, I will attempt to provide a detailed phenomenological account of musical connectivity in this particular musical scenario.
As we saw in Chapter One (section 1.3.3), ensemble performance always requires some degree of shared intentionality; that is, shared goals, representations, and action plans, including an understanding of each person’s role in achieving the shared intention (McCaleb, 2014). This means that joint music making necessarily requires some degree of long-term memory and planning, and will therefore necessarily involve extended levels of consciousness. However, the intensity of this feature of musical experience may vary significantly according to genre. On the one hand, pre-composed genres rely on very explicit and detailed plans that need to be maintained throughout the course of performance. Consequently, performers must be constantly aware of how their present actions relate to every other action, and to the shared pre-conceived idea of the performance. In contrast, improvised genres tend to involve more undetermined and open-ended plans. Moreover, because improvised genres involve a greater degree of uncertainty, they also arguably require greater attention on each present moment in order to maintain intentional attunement.

As we have seen throughout this research, Hindustānī performance is predicated on the basis of a very specific understanding of some key musical concepts (rāg, tāl, lay, tihāī, etc.) and of each person’s musical role in enacting them. In addition, performers also normally have an approximate idea of the performance’s ideal duration, and its general formal outline (number and rhythmic qualities of formal sections, temporal intensification and exchange of musical roles within each formal section). However, given how consistent and generic formal interactions tend to be in this genre (see Chapters Three and Four), most of these aspects can eventually be learnt to carry out
in a ‘quasi-automatic’ manner (Berkowitz 2010; Neuman, 2012), with almost no reflective thought behind them, so that performers are hardly even aware of their interactions at a macro-temporal level (see section 6.5).

In my experience, not only does this very predictable formal representation minimize the need for reflective thought and extended consciousness, but in addition, it also allows performers to focus most of their attention on events occurring within much smaller time frames, mostly within the psychological present. In other words, musical interactions in sitar and tabla performance tend to require little or no long-term memory and planning: they occur spontaneously as a result of unforeseeable musical circumstances and are then quickly forgotten. Surely, some particular forms of interaction – such as complex *tihāīs* or *sawāl jawāb* passages - can extend significantly past the scope of the psychological present. However, these are overall quite rare; in general, performers’ intentional behaviour is confined within rather shorter time frames.

In addition, I have also argued throughout this chapter (based on the preceding chapters’ qualitative and quantitative evidence) that, although sitar and tabla performance would appear to require fairly high levels of reflective understanding, performers ultimately seem to place more value in attaining pre-reflective, non-agentive, co-subjective states. Since, as I propose in Chapter one, such states are primarily enacted and experienced at a core level of consciousness, this implies that such peak musical experiences may be characterized by the intensification of core consciousness and the concomitant undermining and suspension of more extended
levels of conscious awareness (such as intersubjective states of shared subjectivity).

Put differently, Hindustānī performers’ reported preference for co-subjective states - argued throughout this chapter – suggests an emphasis of core over extended conscious experience during these peak moments.

Thus, I would now like to propose that Indian performers’ reported states of self-transcendence during peak musical experiences may be further accounted for by this shift in consciousness. Musicking intensifies core consciousness, firstly, through its rich auditory stimuli, and secondly, through the high level of physical, affective, and attentional engagement required to play skilfully, expressively, and cohesively. This is particularly true for a genre as sonically exuberant, as technically demanding, and as expressive, as North Indian classical music. The capacity to play in time and in tune, with expression, and in a coordinated manner, all require intense awareness of, and engagement with, events happening in the here-and-now. This again is particularly true for improvisational genres such as North Indian classical music, which place relatively greater aesthetic value upon momentary interaction and expression rather than over structural development and musical narrative. Furthermore, given the close relationship between embodied sensation and affect (see section 1.3.2), musical emotion is likewise experienced primarily at the level of core self.

At the same time, Hindustānī music minimizes the need for extended consciousness by relying on very generic and therefore predictable formal structures, and by encouraging the automatization of musical behaviour and thereby undermining the need for reflection (section 6.5). In addition, this process takes place within a broader
identification with an autobiographical self that is fundamentally determined by the musical activity. The adoption of - or projection onto - a musicking autobiographical self contributes towards this shift in consciousness due to the degree of automaticity of behaviour it entails: firstly, in the sense that musical actions and interactions are learnt to be carried in a non-agentive, quasi-automatic manner (Neuman, 2012; see section 6.5); and secondly, in the sense that all the accompanying gestures, behaviours (Rahaim, 2012), as well as values and ideas (Neuman, 1980) associated with this musicking autobiographical self are rather generic in nature (Becker, 2004).

So how does this intensification of core consciousness and concomitant minimization of extended consciousness contribute towards feelings of self-transcendence? Minimizing extended consciousness allows us to forget – partially and momentarily – who we are, other than ‘a person playing music’. This suspension of one’s quotidian autobiographical self, which is partly forgotten and partly cast onto a ‘musicking autobiographical self’, and which is most noticeable in the suspension of one’s internal monologue, is one way in which peak musical experiences may feel self-transcendent. Although the remaining core consciousness still involves a basic awareness of the distinction between self and non-self, and therefore a basic sense of self-awareness, this is probably as close as we can get - as humans - to experience self-transcendence while remaining conscious.

Consequently, I propose that the reason why sitar and tabla performers might relate intersubjective interactions to worldly enjoyment, and co-subjective states to feelings of spiritual attainment, an ultimately, why they appear to place more value
on the latter, has to do with the extent to which either kind of interaction contributes to this idealized conscious state. Co-subjectivity, being pre-reflective, allows for this process of intensification of core consciousness and minimization of extended consciousness. Conversely, intersubjective interactions require reflective thought and highlight the difference between self and other, thereby triggering more extensive levels of self-awareness. Although intersubjective interactions can be both entertaining and aesthetically valuable, they are experienced in a worldlier manner as a result.

In short, I would argue that during peak musical experiences, sitar and tabla performers may come to experience a sense of self transcendence as a result of an intensification in core consciousness, combined with an undermining of extended consciousness, as well as with a sense of agentive displacement, all of which is reinforced through shared cultural practices and spiritual beliefs. I propose that – at its most profound and meaningful level - musical connectivity in this genre occurs within this process of self-transformation, so that, for a moment, performers may feel as though ‘there is only music’.

6.10 Chapter Summary

I began this chapter by arguing that, due to this genre’s complex, improvisational, and highly cohesive nature, musical interactions among performers are likely to involve comparatively high levels of reflective understanding, and hence foster states of intersubjectivity. However, I then noted that Hindustānī performers tend to
describe their peak musical experiences in pre-reflective terms, thus suggesting that these performers may actually place more value in attaining heightened co-subjective states. This, I propose, is achieved by minimizing reflective forms of interaction (i.e. *tihāīs*, imitation, and so forth); by maximizing the effect of pre-reflective musical qualities (i.e. timbre, expression, syncopation, micro-timing, etc.); and by approaching musical creativity and expression in a non-agentive, quasi-automatic manner.

In addition, I also suggested that one of the main reasons why these performers may prefer to connect co-subjectively within a musical context that allows for - and arguably requires - high levels of reflective awareness, is because heightened intersubjective states are perceived and experienced in the form of worldly enjoyment, whereas heightened co-subjective states are experienced as the momentary realization of spiritual aspirations of self-transcendence pervasive throughout Indian culture.

In order to account for these musically-induced states of self-transcendence, I argued that musicking may involve a radical change and intensification of core conscious experience, combined with a momentary reduction or suspension in extended consciousness, both of which are underlined by the adoption of a musical self-identity - or *musicking self* - which is: (i) drawn from pre-existing social narratives (Becker, 2004); (ii) nurtured through pedagogical processes of *tālīm* and *riyaz* (Neuman, 1980; Neuman, 2012); and (iii) manifested through the performer’s musicking body (Rahaim, 2012).
Music, I suggest, can result in personal experiences of self-transcendence by undermining performers’ quotidian (i.e. non-musical) autobiographical self, minimizing extended consciousness (particularly regarding one’s inner monologue), and by intensifying core experiences of selfhood. Through the attainment of non-agentive, heightened co-subjective states, sitar and tabla performers manage to momentarily blur the distinction between self and world, and therefore experience feelings of self-transcendence, or of merger with a greater sense of Being.
Chapter Seven – Conclusions and Future Directions

7.1 Summary of Aims, Methods, and Findings
I began this dissertation by positing music as a form of human behaviour with a powerful and rather unique capacity to foster experiences of social cohesion and togetherness among participants; a phenomenon which I decided to refer to as musical connectivity. These experiences, I noted, are widely acknowledged as both rewarding and enjoyable on a personal level as well as functionally valuable at a social level, and are usually considered to be one of the main factors motivating people to engage in all kinds of musical activities around the world (Blacking, 1973; Small, 1999). And yet, there is also ample evidence that these social experiences may in fact vary rather drastically – in both quality and intensity - within and across different performative scenarios. This is particularly so in the case of North Indian classical music (Moran, 2013; Clayton & Leante, 2015). Although both musicians and musicologists may tend to assume that this variability is tied to the quality of the performers’ joint sounds and actions (Turino, 2008), there is currently little empirical evidence supporting this notion, and therefore no clear understanding of how different kinds of musical interactions may either foster or inhibit varying feelings of connectivity.

In this dissertation, I have tried to offer new insight on how these intrinsically rewarding yet inherently variable experiences of musical connectivity are ‘enacted’ (Varela et al., 1991) by investigating the relationship between musical interaction and social experience in the specific case of live sitar and tabla duo performance, thereby
addressing this topic from an ecologically-valid, non-Western perspective. In the broadest terms, the goal of this research has been to elaborate a detailed phenomenological account of what it feels like to connect with one’s co-performer in this particular genre, and try to understand how these varied social feelings are likely to be shaped - or brought forth - by performers’ joint, contextualized music-making.

Given the complex nature of these questions, I have argued for the need to approach them from an interdisciplinary perspective, combining concepts and methods from music psychology and ethnomusicology. With this aim in mind, I developed a model of musical connectivity based on the concept of intentionality (Tomasello et al., 2005; McCaleb, 2014) and on the distinction between two musically-induced states of shared subjectivity, referred to by McGuiness and Overy (2011) as co-subjectivity and intersubjectivity. The fundamental difference between these two kinds of social experience is that intersubjectivity involves reflective understanding of the other’s separate intentional agency by both the sender and receiver of information, whereas co-subjectivity does not. Intersubjective states are therefore characterized by a clear, communicative awareness of self and other as separate beings, while co-subjectivity states may promote a communal, merging sense of self and other.

These two states of shared subjectivity, I argued, consist of distinct yet parallel streams in musical experience, meaning that experiences of musical connectivity may be both intersubjective and co-subjective, reflective and pre-reflective, communicative and communal. In addition, I also proposed that these distinct streams of consciousness coincide with what Damasio (1999) describes as core and
extended levels of human consciousness: co-subjective states - being pre-reflective - are experienced at a core level of consciousness, while intersubjective states - being reflective - are experienced at an extended level. The goal of this PhD project has been to identify and untangle these separate strands of musically-induced states of shared subjectivity in sitar and tabla performance and learn about which kind of state is more prominent and/or more valued in this genre.

Throughout the course of this research, I have contended with several methodological challenges involved in making musical interaction and its relationship to subjective musical experience the focus of academic research. In part, I have tried to overcome these challenges through traditional ethnomusicological means. That is, by carrying out fieldwork in the North Indian city of Varanasi and studying both sitar and singing with my gurus Debashish Sanyal and Ashish Jaiswal. This approach allowed me to familiarize myself with Hindustānī music, observe and participate in this music’s natural social environment, have both formal and informal conversations with numerous musicians, and reflect on my own personal experience as a sitarist.

In addition, I also carried out a collaborative case study with expert informants Shyam Rastogi and Sandeep Rao, as well as five other professional musicians from Varanasi. This case study enabled me to collect a wide range of qualitative and quantitative data gathered from contexts of ecological validity. The prime use of these data has been to explore the relationship between performers’ contextualized musical interactions, their varied social relationships, and their self-reported feelings of connectivity. Furthermore, recognizing that most of the performers taking part in this
case study were relatively young upcoming artists, and considering that their interactions might be somewhat different to those of highly accomplished performers, I also carried out an in-depth analysis of a 32-minute commercial recording by music master Pt. Nikhil Banerjee (NB) accompanied by Zamir Ahmed Khan (ZAK). Comparing results from both sources allowed me, on one hand, to uncover common patterns in sitar and tabla interaction, and on the other hand, identify certain aspects in musical behaviour which are likely to distinguish an exceptional musician from an average one.

Throughout this research I developed and tested various methods of musical analysis by which to grasp sitar and tabla performers’ musical interactions from a socially-driven perspective, focusing on how performers mutually affect each other’s actions and thereby give rise to functionally-valuable and non-centrally-directed patterns of musical behaviour. In short, these various methods of analysis involved investigating performers’ formal, rhythmic, and micro-temporal interactions from a relational perspective, focusing on how one performer’s actions relate and possibly trigger certain responses from his or her co-performer. The results of these analyses were then correlated with performers’ self-reported feelings of sociality to gain insight as to what kinds of musical interactions are more or less likely to foster connectivity.

In summary, the results of the formal portion of the analysis suggest, firstly, that sitar and tabla performers might share a tacit representation regarding syntagmatic structure consisting of sitar to tabla solo ratio of roughly 3:1, meaning that sitar solos are likely to be about 3 times longer than tabla solos. Secondly, the results of the case
study showed that performers’ relative status is likely to be the prime factor shaping syntagmatic structure, with older and/or more accomplished musicians taking relatively longer solos. However, results also suggest that in scenarios in which performers are of an equal status, such as in the case of Shyam and Sandeep, then performances with higher connectivity levels are also likely to have a more egalitarian syntagmatic structure. Lastly, the analysis of NB and ZAK’s performance revealed a highly egalitarian and interactive formal structure (based on average solo durations, tempo fluctuations, and the concluding sawāl jawāb section) implying that NB chose not to enact his superior musical status at this level of musical interaction.

The rhythmic analysis posed the greatest challenges in quantification, which led me to focus almost exclusively on cadential patterns such as tihāīs and mukhrās. The results of this level of analysis were also somewhat more ambiguous, in that although performers stated they enjoyed and placed great value in having high levels of rhythmic interaction, they also reported that the deepest, most connected performances were often characterized a comparatively passive approach to accompaniment. The performance of NB and ZAK is an appropriate example of this, as I showed that during most of the vilambit the rhythmic interactions between performers are covert and infrequent. Since this situation changes drastically towards the end of their performance, I suggested that this lack of rhythmic interaction is deliberate, and probably based either on NB’s well-known introspective character and style of playing, or a possible Khyāl model which also implies little rhythmic interaction. This ambiguity was likewise reflected in the case study’s empirical analysis. Although there was a tendency for performances with higher connectivity
ratings to display higher levels of rhythmic interaction, there were also many exceptions to this general trend.

The micro-temporal analysis revealed in many ways the most conclusive – and arguably unexpected - insight regarding performers’ interactions and the way in which these interactions relate to both skill and connectivity. Firstly, the analysis of NB and ZAK’s performance revealed very consistent patterns in micro-timing pertaining to a robust relationship between musical role on one hand, and relative phase, asynchronization and isochronization on the other. Secondly, not only did the results from the case study largely support these conclusions, but also revealed an interesting and somewhat surprising relationship between higher asynchronization values and lower levels of coupling on the one hand, and both higher connectivity and musical skills on the other hand. These results – which, must be noted, apply only to the relatively slow opening sections of a performance – suggest that these performers may have been exploiting micro-temporal asynchronies to maximize musical expressivity, and that this process may have in turn fostered positive social feelings. Moreover, these results also suggest that using micro-temporal asynchrony effectively requires both musical and interpersonal skills, which - I speculate - involve precisely coordinated metrical attending and the sharing of tacit, pre-reflective, and bodily representations regarding the relationship between micro-timing and other variables such as formal structure and surface rhythm.

In Chapter Six, I drew from the various conclusions arrived at throughout the previous chapters in order to provide a phenomenological description of musical connectivity
in sitar and tabla performance. This description is based on the model of musical
connectivity presented in Chapter One. I began by arguing that, given this music’s
technical requirements, improvisational nature, clear division of roles, and high level
of musical cohesion, it would appear that musical interactions in this genre must
require high levels of reflective awareness and therefore be permeated by frequent
states of intersubjectivity. However, I then presented numerous evidence that these
performers actually tend to describe their peak musical experiences in pre-reflective,
non-agentive, self-transcendent terms, all of which suggest that they might actually
place more value in attaining heightened states of co-subjectivity instead.

These states, I argued, are brought forth through a combination of musical features,
including (i) the minimization of reflective forms of musical interaction (i.e. tihāīs,
imitative passages, etcetera); (ii) the instruments’ unique tonal qualities; (iii) the use
of micro-temporal asynchronies for expressive effect; (iv) the expressive execution of
a rāg’s gestural and emotional character, particularly during slow portions of
performance; (v) increase in interpersonal attention caused by syncopation (i.e.
laykāri); and (vi) the attainment of a non-agentive, ‘quasi-automatic’ (Berkowitz,
2010) approach towards musical creativity and expression, nurtured through the
pedagogical processes of tālīm and riyaz (Neuman, 2012), and further supported by
the conceptualization of rāg as an autonomous musical agent (Clayton, 2005).

Noting the impact that matters of spirituality have had throughout this music’s
historical development (Rowell, 1992; Sanyal & Widdess, 2004), and continue to have
to this day (Neuman, 1980), I suggested that one of the reason why Hindustānī
performers might value co-subjective states over intersubjective ones is that the former may be related to states of spiritual transcendence, whereas the latter are experienced in the form of worldly enjoyment (Clarke & Kini, 2011). In other words, given that co-subjective states are characterized by lack of reflective awareness of self and other as distinct intentional agents, they may be associated with - and moreover, be experienced as the realization of - idealized states of self-transcendence pervasive throughout Indian culture. Consequently, I argue that while Hindustānī music offers performers ample possibilities of connecting both co-subjectively and intersubjectively, they ultimately seem to place more value on the former due – in part - to its spiritual connotations.

Lastly, I tried to account for these musically-induced states of self-transcendence by arguing, first of all, that from an embodied and enactive perspective (Varela et al. 1991; Becker 2004) selfhood is a somewhat malleable, emergent phenomenon, and that therefore intense musical engagement may give rise to what may be referred to as a musicking self; that is, a sense of self that is markedly different from a quotidian (i.e. non-musical) self. I then argued that, since co-subjective and intersubjective states are experienced at separate, core and extended levels of consciousness (Damasio, 1999), then performers preference for heightened states of co-subjectivity may involve an intensification of core selfhood and a concomitant minimization of extended consciousness, thus momentarily suspending their internal monologue and undermining their autobiographical sense of self. This, I suggest, is maybe as close as most of us can come to experiencing self-transcendence within the boundaries of human consciousness.
7.2 Contribution

Overall, the aim of this research has been to provide new insight to our understanding of how people play music together and experience varied feelings of togetherness while doing so. By addressing this question from an interdisciplinary perspective, I have tried, on the one hand, to offer music philosophers and psychologists a phenomenological, ecologically-valid, and non-Western account of how positive feelings of sociality are likely to be brought forth in the course of ensemble performance; and on the other hand, to provide Indian music researchers with a detailed description of the musical interactions, mental processes, and social experiences underlying joint performance in this genre.

Although the focus of this work has been on one specific genre, many of the issues discussed and investigated throughout this dissertation are relevant to current research in music psychology. In my opinion, this dissertation’s most useful and wide-reaching contribution consists of the model of musical connectivity developed in Chapter One, and which forms the basis of this entire research. This model – which is based primarily on the works of McCaleb (2014), McGuiness and Overy (2011), and Damasio (1999) – provides researchers with a tool by which to relate specific kinds of musical interactions with specific states of shared subjectivity and concomitant states of consciousness. Since this model can be applied onto any musicking context, I believe it has the potential to help narrow the epistemological gap in music psychology noted by Schiavio (2014), regarding our current lack of understanding of
the relationship between musical interaction and social experience in ensemble performance.

At the same time, this research also makes a more specific contribution to our understanding of joint music making in Hindustānī performance, thereby adding to the works of other scholars such Sorrell and Narayan (1980), Clayton (2000; 2007b), Napier (2007), and Moran (2013b). In this dissertation, I have provided a concise account of how sitar and tabla performers interact by: (i) describing some of the most important musical concepts underlining Hindustānī performance, (ii) describing each performer’s role in enacting these concepts, and (iii) taking into account the social environment within which this music is embedded. However, I have also criticized this level of musical description due to its neglect of music’s emergent and relational properties, which I argued must be taken into account in order to explore the topic of musical connectivity, and ultimately, attain a more socially-driven perspective on music making (Moran, 2014).

In order to overcome this situation, I developed novel methods of musical analysis by which to grasp musical interactions among sitar and tabla performers from what Marsh et al. (2006) refer to as a ‘relational’ perspective. This has allowed me not only to provide new insight regarding sitar and tabla performers’ formal, rhythmic, and micro-temporal interactions, and uncover some functionally-valuable musical qualities which emerge from this dynamic, non-centrally-directed process, but more importantly, to explore how these varied, contextualized interactions relate to performers’ self-reported feelings of sociality. Consequently, I have been able to
postulate several hypotheses regarding how sitar and tabla performers are likely to bring forth positive social feelings in the course of live performance.

Perhaps the most specific way in which I have contributed to this line of research comes from the micro-temporal analysis, which allowed me to uncover both recurrent micro-temporal patterns in sitar and tabla performance as well as an unexpected correlation between high levels musical skill and connectivity on the one hand, and comparatively high levels of micro-temporal asynchronization and lack of coupling on the other. This topic is currently at the centre of musicological research, as exemplified by the ongoing Durham-based research project on ‘Interpersonal Entrainment in Music Performance’ (musicscience.net/projects/iemp). And yet, this research is – to my understanding – the first micro-temporal, entrainment analysis of major portion of a sitar and tabla performance, as well as the first comparative analysis on the relationship between Indian performers’ micro-temporal interactions and concomitant social experiences.

Lastly, this research provides a detailed phenomenological account of musical connectivity in live sitar and tabla duo performance. This is done by applying the afore-mentioned model of musical connectivity, combined with ethnographic data collected through fieldwork, interviews, and reflective practice, in order to identify the more prominent and/or valued musically-induced states of consciousness and shared subjectivity in this genre. In addition, I have also tried to explain why these particular states are idealized by reference to the socio-cultural environment within which this music is embedded (Clarke & Kini, 2011), and explain how these idealized
states are enacted by drawing on theories in cognitive psychology (Varela et al. 1991) and neuroscience (Damasio, 1999). In doing so, I have tried to contribute to a long line of ethnographic research on social issues pertaining to *Hindustānī* music, stretching from the classic works of Neuman (1980) and Kippen (1988), to the more recent works of Moran (2013a) and Clayton and Leante (2015), as well as to the incipient research on music and consciousness (Clarke & Clarke, 2011).

7.3 Limitations and Future Directions
In closing, I would like to acknowledge some of this research’s limitations and point to some possible directions in which to move this work forward. First of all, one aspect of this research which could admittedly be construed as a limitation is the fact that most of the performers taking part in the central case study were relatively young upcoming musicians. Whilst, as I argued in Chapter Two, I am ultimately confident of the inherent value of the results obtained through this approach, a possible direction for future research could involve carrying out a similar investigation with more senior and established musicians. In my view, doing so would not necessarily confirm or refute the results obtained through the present case study, but rather provide further insight as to what constitutes both personal and interpersonal musical skill in this particular style, as well as allowing one to explore the manner in which these skills may contribute towards the attainment of higher states of musical connectivity.
Secondly, whilst carrying out this case study I have had to make several methodological compromises in order not to inhibit performers’ normal behaviour and possible connectivity. These include, for instance, giving performers no instruction as to what to play, allowing them to perform in dark settings, and making a limited use of video recall. As a result, this research has suffered from some limitations regarding the possibility of carrying out both comparative and in-depth video analysis, and possibly, in identifying moments of high and low connectivity with greater accuracy. In addition, using more advanced methods of audio recording and onset extraction may have allowed me to analyse larger quantities of onset data, and maybe even include faster tempos as part of the analysis. These methodological issues should be reconsider for future projects.

Thirdly, another area for future development pertains to the formal and particularly the rhythmic portions of my analysis, since, as I see it, this research has only begun to reveal the tip of the iceberg of the rich and varied musical interactions that constitute sitar and tabla performance. On the one hand, the formal analysis could be improved and consolidated by including a larger number of commercial recordings by several master musicians. This would not only offer greater and more nuanced evidence regarding sitar and tabla performers’ tacit representation of syntagmatic structure proposed in Chapter Four, but could also potentially reveal particular characteristics regarding well known musicians’ approach to formal presentation and interaction. On the other hand, the rhythmic analysis presents the widest scope for future elaboration, essentially, by expanding its current range beyond just cadential passages during slow and medium tempos. Doing so would require a system by which
to accurately identify, quantify, and compare subtler and more ambiguous forms of rhythmic interaction. Though challenging, this would allow us to postulate more robust relationships between such interactions and positive feelings of sociality.

Lastly, as I stated in this dissertation’s opening pages, the capacity to enact positive feelings of sociality through musical interaction is both a defining and ubiquitous human trait. Consequently, I believe this research has great potential for wider comparative analysis beyond the very specific case of sitar and tabla duo performance. A cautious way of approaching this idea would be to explore the question of musical connectivity in other North Indian instrumental and vocal ensembles, while a more ambitious and exciting approach would be to explore the relationship between musical interaction and social experience in entirely different musical genres, and then compare the results with those obtained through this research. Although I suspect that adopting the latter approach is unlikely to reveal consistent relations between the enactment of musical connectivity across different styles, I might be wrong. And moreover, doing so would provide a broader outlook and understanding of this unique and life-enriching human experience; one which, as many scholars argue (McNeill, 1995; Cross, 1999; Mithen, 2005; Dissanayake, 2009), may have played a fundamental role in human evolution, and continues to play a key role in people’s personal and social lives throughout the world to this day.
Appendix A – Micro-timing data for performance of *rāg Sindhu* Khamāj

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<th>S1</th>
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<th>S3</th>
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<tr>
<td><strong>R. Phase (°)</strong></td>
<td>-35.7</td>
<td>-3.2</td>
<td>-31.3</td>
<td>11.6</td>
<td>-32.5</td>
<td>9.7</td>
<td>-27.3</td>
</tr>
<tr>
<td><strong>L. M. Vector</strong></td>
<td>0.919</td>
<td>0.943</td>
<td>0.918</td>
<td>0.976</td>
<td>0.902</td>
<td>0.976</td>
<td>0.905</td>
</tr>
</tbody>
</table>

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Glossary

ālāp: Introductory section without metre or pulse
anibaddh: Unmetred
antarā: Third section of instrumental melodic composition (i.e. gat)
arohi-avrohi: A rāg’s ascending and descending scale
ati-: Very, very much
āvart: Cycle (of tāl)
baj: Main melodic sitar string
bandiś: Vocal composition
bol: Mnemonic syllables indicating instrumental strokes
cakkardār: Extended tihāī, each of whose phrases itself includes a tihāī
chikarī: Sitar strings used for rhythm, rather than melodic purposes
dādrā: (1) A vocal genre, (2) a tāl of 6 beats
dhrupad: A vocal genre
dhun: Instrumental composition based on folk tune
drut: Fast tempo
ektāl: A tāl of 12 beats
gamak: Melodic ornamentation
gat: Instrumental composition
gharānā: Stylistic ‘school’ or tradition
guru: Teacher
Hindustāni: North Indian (music)
jhālā: Fast, closing section of instrumental performance
jhaptāl: A tāl of 10 beats
jor: The second section of solo instrumental performance, characterized by introduction of pulse
jora: Second sitar string, used mainly as drone
khālī: (1) Tāl beat or section marked by a wave, (2) tabla stroke without bass resonance
khaṛaj: Bass (string)
khyāl: A vocal genre
lay: Tempo, rhythmic density
laykārī: Rhythmic manipulation or variation
madhya: Medium (tempo)
mañjhā: Second section of instrumental melodic composition (i.e. gat)
masītkhānī: A type of gat
mātrā: Beat, time unit
mehfil: An intimate gathering for musical performance and listening.
miṅḍ, mīr: Glissando
mukhyā: Section of melodic composition (i.e. gat) preceding 1st beat of tāl (i.e. sam)
nād: Sound
nibaddh: Metred
Pandit: Learned one. Used as respectful form of address for Hindu musicians
rāg: Melodic mode
riyaz: Regular, disciplined practice
rūpak: A tāl of 7 beats
sam: Beat 1 of tāl cycle
sargam: 7-note solfege system, comprised of notes Sa, Re, Ga, Ma, Pa, Dha, and Ni
sawāl jawāb: Question and answer, imitation.
shishya: Student, disciple
sthāyī: Second section of instrumental melodic composition (i.e. gat)
swar: Note or pitch
tāl: Metre, metric cycle
tālī: Tāl beat or section marked by a clap
tālim: Training
tān: Fast improvisation
taraf: Sympathetic strings
ṭhekā: Diagnostic drum pattern associated with a particular tāl
tihāī: Cadential figure comprising a phrase repeated three times	intāl: A tāl of 16 beats
Ustād: Master. Used as respectful form of address for Hindu musicians
vibhāg: Section of a tāl cycle
vilambit: Slow (tempo)
References


