

The Harmonic Perspective of Rhythm:

**Applications for the Expansion of Musical Awareness and the
Acquisition of Rhythmically Complex Music**

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Abstract

This study describes and evaluates a new paradigm for informed rhythmic practice: the harmonic perspective of rhythm. Normal, theoretically driven or written rhythmic conceptions have tended to rely on a limited grid based on one predominate metric cycle that is expanded by binary division into twos, fours, eights and so on, or by ternary division into threes, sixes, twelves, etc. The harmonic perspective, however, posits that, for much of the world's music, a broader, multidimensional grid is in use. Such a conception allows not only for a wider palette, drawing on metric structures of one through nine and beyond, but also for the simultaneous use of several of those structures, thus rendering those musics in question rhythmically multidimensional. This multidimensionality seems to operate on the level of feel—where two subdivisional references exhibit a unique pull from which different styles and/or performers find their own subtle, non-isochronous balance; on the level of basic compositional structure—where two or more metric structures co-exist in relative balance to create the background of the piece; and on the level of melody and improvisation, where performers draw on more than the usually considered, compositionally prescribed, metric structures for their expression. The viability of this perspective is established using examples from the African Diaspora. Practical exercises as prescribed by Puerto Rican percussionist and theorist Efrain Toro are presented, discussed and evaluated, and the applicability of the perspective to the learning of Indian rhythm is considered. The research is conducted as a subject-centred ethnography, combined with a self-reflexive/auto-ethnographic approach, where the researcher applies his own experience, observations, and insight to questions raised by the study. Foundational discussions of constructed versus experiential knowledge, the author's background, and Indian rhythmic systems precede and accompany the primary discussion.

Key Words

Harmonic Perspective of Rhythm; Multidimensionality; African Rhythm; Indian Rhythm; Polymetre; Polyrhythm; Linear; Harmonic; Efrain Toro; Awareness

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Terminology and Notation

There are quite a few Indian, Caribbean (mostly Spanish) and West African terms used in this study. I have chosen to use the spellings as I encountered them in other peoples' works, even when two different spellings for the same or similar terms were used. I feel this better represents the actual practice as one will find it in the literature or in working with different teachers. These differences also remind us that many of the terms in their common usage are either not written, or are written in other scripts (e.g., Tamil, Telugu, Hindi, Urdu, Sanskrit, etc.). I have included explanatory notes where appropriate and italicized all non-English words.

I have also chosen to denote numeric time cycles (metres) in italics, and other numeric designations in normal script. For example, 'Beats one, two, and three of *four*,' refer to specific temporal locations, or points of articulation, within the conceptual designation of *four* as the repetitive cycle. Normal, Arabic numbers are used on occasion, I hope their specific referents will be clear.

Most of the examples in music notation are rhythms on one or two lines. For *tabla*, the top line is for the smaller drum, the bottom line for the bass drum. 'X's represent dry, non-sustaining or closed sounds (also slaps on the *jembe*, or occasionally, just a second, distinct sound), while other note heads are for open tones, of various types, or for no particular sound. A fairly standard drum set notation is also used. The examples are not meant as repertoire specific instructional material but rather for conceptual support. Three legends are presented below.

Handclap

Tabla

num dhin ki ta tha ke Tham num dhin ki ta tha ke Tham tha num dhin ki ta

Jembe (hands)

Bell and Bass drum (sticks)

Drum Set

bass snare hi hat foot ride cymbal tom tom

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NB: The audio examples are for demonstration purposes only, to help give the reader an aural experience of some of the notated musical examples. I attempted to present them slowly and clearly, and, as a recurrent theme in this study is experiential knowledge, they are recorded 'by hand,' as it were, with a few obvious exceptions. Headphones are recommended, as is tapping along. The recording quality is sufficient, I hope, for the intended purpose. Finally, if reading the .pdf version, the audio files are imbedded in the text, so reference to the cd is not necessary.

Introduction

This study began as a labour of love; love for rhythm, love for traditional rhythmic music, and love for practicing unusual and inspiring combinations of disparate rhythms. These combinations were at first drawn from music traditions I had had some experience with, especially those of West African and Afro-Caribbean origins. With a brief exposure to some of the ideas and exercises of Efrain Toro, however, I began to work on combinations of rhythms for their own sake; on how to play *two* and *three* and *five*, for example, all at the same time. These sorts of challenges were compelling; from hints I had received through Bruce Baker, a local drum instructor familiar with Toro's approach, and then from a lecture/demonstration by Toro himself at the University of KwaZulu-Natal (UKZN), it was suggested they had implications for the playing of actual music, though I didn't know of any actual music that used such combinations.

I was familiar with African, Brazilian, Haitian and Cuban music in compound metres (mostly, 12/8) that could be regrouped as *four*, *three*, *two* or *six*, effectively presenting in the music as these various pulse structures, often in simultaneous combinations. But what was the point in learning to play *four* and *three* with *seven*? Or *five* and *two* with *nine*? It would seem these sorts of challenges are mostly that: challenges for the interested rhythmic specialist to use for general edification. Or were they to prepare to play in odd metres? To play Indian or Balkan music perhaps? But why three different metric cycles at the same time?

Eventually, after seeing Toro's lecture and working on his material for a few months, I decided I wanted to pursue the study in a more formal way. Toro had suggested that these were not just isolated challenges and the resultant circus tricks, but archetypal material that did indeed apply to other more 'normal' music. This included music that I enjoyed listening to and/or playing, such as Afro-Cuban Rumba, Spanish Flamenco or Nigerian Bata music.

I made an initial proposal to study the application of this new perspective, ordered a few of Toro's books, and struck up an email conversation with him. This led, eventually, to my supervisor organizing a visiting lecturer/mentor post for Toro at UKZN, and an opportunity for me to try to learn what he was so passionately trying to say about rhythm, from the source. His post lasted, after an extension, from June to early December, 2012.

I found that Toro's interests were wide-ranging, from quantum physics to comparative mythology, astronomy to Yoga, naturopathic medicine to special relativity, cooking, politics and surfing, but that, invariably, all this related to rhythm. With a bit of clever argument, perhaps everything can be seen as the interaction of cycles, of frequencies, in time. Still, such a statement can lend an air of New Age generality that sceptics can use to great advantage. Toro was aware of that danger and expressed his hesitation to be perceived in that way. But his great advantage in his pursuit and proclamation of a quasi-unified theory of frequency is his expertise as a performer. Toro can do things with rhythm that astound the mind and the senses. He clearly has seen something in the way that frequencies manifest and interact that most of us cannot quite grasp. This is also a great hindrance for him; how can one person make someone else understand their experience, after all? And, perhaps, our peak experiences have the capacity to skew our perceptions with the emotional power and mental clarity they seem to engender. Whether or not this is true in Toro's case, it is possible others might see it that way, asking themselves, "Is he crazy? What *is* he on about anyway?" I can think of two accomplished musician friends that also commented, after seeing him play, that he was crazy (one said it in French: "*Il est fou!*" ("He is crazy!")), but in those cases, the intention was thoroughly positive; they were both overwhelmed by his capacity with rhythm.

This study then, is my attempt to make sense of some of the views and insights of a man I see as an eccentric genius, provocative statement though that is. The process has been invigorating and frustrating at times; Toro and I did not always see eye to eye. My in-depth exposure to Toro's skills, ideas and perspectives has changed the way I understand and perceive rhythm, music, and maybe even the world. The reframing of perspective is hardly a new experience; it is rather a periodic, expected though unpredictable part of musical growth. Nevertheless, herein is presented the state of that evolution, especially in terms of rhythm. Some musicians and scholars might feel disappointed that this is just a drum paper. Harmony and melody are also close to my heart, and it is not without some reticence that I mostly exclude them here. But it is my hope that the reader will find something to embellish all of his or her music practice and, especially, perspective.

As proposed at the onset of this experience several years ago, I apply some of this newfound perspective to my ongoing process of learning Indian rhythm on the *tablas*. This is the primary hypothesis test: Whether the harmonic perspective of rhythm offers a theoretical base robust enough to deal with this most complex of rhythmic systems. This in turn necessitates a discussion of general Indian rhythmic principles—a vast subject on its own—and some observations on the learning process as documented in the literature, in relation to my own experience.

Besides the discussion and analysis of the central focus of the study, the harmonic perspective of rhythm, several other themes are introduced and woven throughout the narrative. Constructed versus experiential knowledge is an important epistemological consideration that informs all our experiences as makers and connoisseurs of music. What do we know and how? Can we give what we know to someone else, and if so, is it important to think about how that might succeed? Though originally proposed as an auto-ethnographic study, the methodological stance has since shifted to embrace a dual approach: self-centred and subject-centred ethnography. These two, related approaches are unveiled and examined in an attempt to help the reader understand how the observations and analysis were generated: Under what epistemological stance? What are the limitations and strengths of the method, uncovered as we attempt to establish the validity of the findings? The author's background section goes into some detail, inspired by the autoethnographic approach and some of its literature, in the attempt to establish in the reader's mind the perspective that has been gathering through the decades; especially an outside/inside perspective that has been instrumental and inspirational in the continual search for ever-wider, unifying visions of musical and rhythmic experience.

This study will address the following issues in particular:

1. The extent to which the acquisition and application of polymetric inter-dependence can add significantly to overall musicianship, with special reference to percussionists learning foreign, rhythmically complex music outside of their own musical traditions, at both the macro/syntactical and the micro/groove levels of reference.
2. Whether it is possible for one person to experience more than one metric reference at the same time, thus challenging and interrogating the view of music psychology expert Justin London who states, "There is no such thing as polymeter." (London 2004, p.50) From a musician's perspective, polymetre appears to be engaged at an experiential level in numerous contexts. London questions our cognitive capacity to experience two different metres at the same time; this study will investigate this issue further and seeks to provide evidence to further develop and clarify this discussion.
3. Whether and in what ways the idea known herein as, "The Harmonic Theory of Rhythm," presents an ecologically inspired model that has broad and even transformational applications in the way we conceive of music both conceptually and pedagogically.

The research also lends itself to consideration of broader philosophical questions, including:

1. In what ways does the dichotomy between constructed knowledge and actual practice distance us from that practice and from a holistic experience of that being investigated, or from reality itself?
2. Do theoretically informed practitioners (in this case musicians and composers) in some cases assume a one to one correspondence between theory and practice, and in so doing, are they substituting the model for the subject? Does the tendency to objectify and explain impoverish the full experience of the creative process?
3. In what ways can we attempt to act in cognizance with the great body of theory left to us in any one discipline and at the same time cultivate a thorough experiential perspective, deriving maximum benefit from each?

Many things is on my mind, words in the way. (Stone 1969)

Constructed Knowledge and the Experiential Perspective

Constructed Knowledge, in the present discussion, is that knowledge which is intellectually derived from felt experience. It consists of observations, theoretical constructs, instructions for the re-creation of the felt experience (including, potentially, acquisition of the requisite technique), graphic or phonetic notational systems, and the like. This could, in fact, refer to what we think of as ‘knowledge’, in most circumstances. It can be contrasted, however, with *experiential knowledge*. This could be the felt experience itself, before any significant learning has taken place; or, the acquired capacity to do something—what it feels like to *know how* to do something. This is essentially a pre-verbal condition, although it may generate verbal observations or even guiding verbal instructions. These verbal instructions to self or pupil constitute the beginning of constructed knowledge: *observations* of what is, as opposed to the very thing being observed, be it material or phenomenological, felt or imagined.

Constructed knowledge is, of course, an extremely powerful tool. It is the capacity to generate and communicate constructed knowledge that sets human beings apart from the other organisms of the planet. (Parker 2003, 76) Other animals that learn from each other do so by direct observation. Since the advent of language, however, humans have been able to pass on their experiences as stories; we have been able to ask questions and give answers; we can give directions and orders. As powerful as constructed knowledge has shown itself to be, however, it does present hazards, that, left unexamined, can be the source of misunderstanding and the misrepresentation of reality.

Between the first instructions for starting a fire and the code that creates and runs the applications on our smart phones, the immense potential of verbal communication and its various symbolic offshoots is obvious and staggering. That it underpins the vast palette of options—psychological and material—available to our species seems obvious. Some of these capacities have also caused great harm and destruction, to the environment to which we owe our form, and to ourselves. It is not to discuss the myth of Pandora, however, that I bring up the subject.

In the context of this study, the fundamental difficulty with constructed knowledge, as alluded to above, is that it is a representation of reality, not reality itself. To grapple with this conundrum, consider trying to teach a baby how to walk. Most babies learn to walk before their verbal faculties are fully developed. Regardless of the child’s capacity for language however, the underlying physical process is so complex that neither the brilliant orator nor the genius mathematician, physicist, or ro-

botics engineer could come near to describing to the debutant how to do it, *in real time*. It is something that *must* be experienced—tried, felt, adjusted, and re-tried—thousands of times. In this way the pre-verbal child, or the non-verbal dog, lizard or horse knows something about walking that a non-walking intellect can never know. That is, what it feels like, and how to do it. In humans, more than any other species, we find many examples of learned behaviours that, though they are dependent on a great many prerequisite genetic adaptations, are acquired, *or not*, in lived experience. Music is a prime example.

David Elliot uses the terms propositional, or formal musical knowledge, and procedural, or informal musical knowledge. (To these he adds two more categories, impressionistic and supervisory musical knowledge. (Elliott 1995, 60–68)) In line with the findings of this paper, he finds the essence of musical practice to be procedural:

It follows that while formal knowledge about music and music making is necessary to become a music teacher, critic, or musicologist, it is neither a necessary prerequisite nor a sufficient co-requisite for achieving competent, proficient, or expert levels of musicianship. (Elliott 1995, 62)

Some music makers direct the impulse to make music, in relatively direct fashion, to their most appropriate genetic capacities: those involved in hearing, sound production (with the voice at first, this might be later adjusted to produce sound on external objects), comparison to the aural image, and repetition. Add to these working memory, which might be, it seems, the 'glue' that holds this process together¹. This feedback loop can be condensed and dubbed, 'mimicry' (I will leave out creative capacity, assuming a capacity for expression as its foundation).

With reference to a verbalized body of knowledge however—be it lessons, advice, books, methods, self-initiated *theoretical analysis* or a conservatory education—we engage with this other sense of 'formal,' knowledge (propositional, shared, verbal, conceptual, and constructed are some of the other possible signifiers).

¹ According to a recent study of eight child prodigies, six of whom excelled in music, working memory was shown to be the most significant contributing factor to their prodigiousness—in the 99th percentile and above for all subjects; other capacities tested, including fluid reasoning, knowledge, visual spatial abilities and quantitative reasoning, failed to indicate as dramatic a correlation. (Ruthsatz and Urbach 2012)

Another way to approach this discussion is to talk of knowledge versus skill.² 'Knowledge' in this case being 'intellectual knowledge' and 'skill' being another word for 'experiential knowledge.' Philosophers might talk of epistemology versus ontology: The study of knowledge versus the study of being, or what we see (feel, hear, etc.) versus what we say something is.³ Still another set of terms are 'implicit knowledge' and 'explicit knowledge', the former referring to practical skill and the latter to theoretical understanding. Many human endeavours, music foremost among them, are successfully approached with a *combination* of implicit and explicit knowledge (what we experience, 'figure out,' and/or are genetically pre-disposed to be able to hear *and* do versus what we are told and able to apply to enhance our predisposition). This underpins the fact that in practice, we do *attempt* to describe felt reality, even if it is impossible. These attempts then add to the body of explicit knowledge that can help our future selves and/or others find the desired experience.

Elliot posits that competent to expert music makers find ways to incorporate these two realms of musical knowledge. They 'proceduralize' their formal knowledge, reaching the level of 'thinking-in-action.'

An expert level of musicianship is distinguished by the full development and integration of procedural, formal, informal, impressionistic, and supervisory musical knowledge. The artist's level of thinking-in-action is so rich that he or she not only solves all problems of musical execution in a composition, she deliberately searches for and finds increasingly subtle opportunities for (or problems of) artistic expression. (Elliott 1995, 71)

This praxial ambition is based on the refutation of the old dualistic notion that actions follow words. The two kinds of knowing are rather integrated.⁴ This is one of the hallmarks of artistry.

Parallax

This 'neither/nor' condition is expressed in the work of popular philosopher Slavoj Žižek as 'parallax.' Of his three main modes of ordering this enquiry (parallax can be applied to many subjects, so Žižek chooses to group them into three general categories), philosophical, scientific, and political, I find the second most applicable to the present discussion.

First, there is the ontological difference itself as the ultimate parallax which conditions our very access to reality; then there is the scientific parallax, the irreducible gap between the phenomenal experience of reality and its scientific account/explanation, which reaches its

² Elliot posits that the original, Old Norse meaning of the word *skil*, akin to 'understanding,' or 'competence,' would be more appropriate as a term for comprehensive musical understanding, or musicianship. Our modern usage tends to suggest a false, dualistic view that verbal knowledge represents true understanding. (Elliott 1995, 68–69)

³ This can lead to slippery ground as the attempt to discuss something in prose that is non-verbal would seem tautologically impossible.

⁴ It is here inferred that actions are also knowledge. "In the contemporary view, actions are nonverbal forms of thinking and knowing in and of themselves." (Constructed Knowledge and the Experiential Perspective 1995, 55)

apogee in cognitivism, with its endeavor to provide a “third-person” neurobiological account of our “first-person” experience; last, but not least, there is the political parallax, the social antagonism which allows for no common ground between the conflicting agents (once upon a time, it was called “class struggle”)... (Žižek 2006, 10)

A discussion of Žižek's 'philosophical' realm of parallax, though not unthinkable, would nevertheless constitute a relative digression in this case; I will assume that the phenomena under scrutiny—sound, frequency, rhythm, and music—are indeed real, if only in our collective and/or individual consciousnesses. We need not discuss political parallax here. It is with 'scientific' parallax that we are concerned, this 'irreducible gap,' which must remain as such. It seems we are condemned to forever jump between the two sides—phenomena and explanation—not able to freeze mid-flight as it were, for the experience halts with the realization yet the realization is nothing without the experience. Or, can we remain, tight-lipped, in the experiential realm? In this case, explanations cease, and our discussion is finished. Or, perhaps, we have the experience, and we describe it later. It has been my experience with engaging in difficult, multidimensional musical material such as Toro's, and in piano playing, that I must find a way to 'turn off' my conceptual mind to give full attention to the demands of performance. This is likely the meaning of Charlie Parker's famous line, "Learn the changes, then forget them⁵." In the realm of performance, perhaps Elliot's 'thinking-in-action,' is the ideal.

Philosopher and mathematician Bertrand Russell considers the same phenomenon and comes to a similar conclusion:

Sensation, perception, and memory are essentially preverbal experiences; we may suppose that they are not so very different in animals from what they are in ourselves. When we come to knowledge expressed in words, we seem inevitably to lose something of the particularity of the experience that we seek to describe, since all words classify. (Russell 1992, 441)

The mediation of this experiential/conceptual parallax is a process we might apply to any active or perceptive experience; in short, perhaps, any sensory experience. This realization—and the capacity to be primarily in one state or another—is of great significance to the performer; the ability to embody the experience, less so the analysis, lends power and focus to an unfettered presentation. Of course, if the analysis is part of the performance—interactive public speaking, comedy, improvisation come to mind—we can quickly take the argument into a hall of mirrors. Perhaps in these cases an appreciation of the parallax and the ability to negotiate it comes even closer to the fore.

⁵ According to Wikiquote, the original is, “You've got to learn your instrument. Then, you practice, practice, practice. And then, when you finally get up there on the bandstand, forget all that and just wail.” (“Charlie Parker - Wikiquote”)

We are potentially constructing the confrontation between the scientific and philosophical approaches, or, in the observations of Piaget:

One could say familiarly (and with apologies to the metaphysician) that the philosopher can be recognized by the fact that he talks about everything at once—and he is indeed compelled to by the mutual overlap of the questions with which he is involved—whereas the scientist does his best to deal only with one thing at a time. (Piaget 1977, 66)

It might seem I side with the philosophers in this scenario; on the contrary, I choose both. I believe the great scientist, though fully committed to the extension of conceptual knowledge (often and largely by reduction of variables, by linear, rational process) does so fully cognizant of the ever-present, ever-lasting mystery, one aspect of which is the non-linear, multidimensional nature of our every experience. In the words of Einstein:

Try and penetrate with our limited means the secrets of nature and you will find that, behind all the discernible concatenations, there remains something subtle, intangible and inexplicable. Veneration for this force beyond anything that we can comprehend is my religion. (Einstein 1971)

The Price of Inattention

But what of analysis and conceptualization? Can the musicologist or sensitive composer/performer take advantage of both the experiential and theoretical realms of knowledge as windows to different kinds of truth? Performance strategies aside, the practical and ethical considerations of an ignorance of the experiential/conceptual parallax expose us to the potential—and peril—that in our conceptual fantasies we may drift away from the truth of experience. A consideration brought forth several times in the present study is the idea that explicit knowledge can or has, in certain cases taken away from the perceptual focus implied in the acquisition of implicit knowledge. Particularly, it is Toro's contention that the codification of rhythm in Western music notation and, by extension in Western music education, has simplified the rhythmic grid within which we tend to perform and conceive of music.

Recognizing that there is a universe of space between one note and another enables the perception of style in music. The idea of a well-tempered scale and military drumming comes from the same concept, in which there is no variation or there is a fixed space between notes. Western popular music today is mostly based on a military approach. The notes are played in perfect spaces between one another and this creates a one-dimensional sound with different layers of subdivisions. On the other hand many other styles such as Afro-Caribbean, Brazilian, Nigerian, and North and South Indian music, are played with a more natural approach. The sounds or notes are played within all the divisions and subdivisions of time allowing for fluctuations. All the layers of rhythms from one to nine all happening at the same time.

Drums and drum music have not been allowed in western religious rituals for a very long time and the only institutionalized place to play drums has been in the military. **It is not**

possible to play all different styles of music with the fixed space concept of the military approach.

Ethnic or traditional music sounds different than western popular music, because western pop music has a tradition or concept of fixed spaces between notes, like that of western military style music. (Toro 1995, 7–8, emphasis as in original)

Thus he contends that practitioners of the various 'Ethnic' musics⁶ of the world have a wider palette of rhythmic 'colours,' and significantly, a *multidimensional* rhythmic concept because they do not work from the relatively constrained theoretical standpoint inherent in music notation. This term, and the related term 'harmonic' will be seen throughout this study, mostly in a sense contrary to the idea of *linearity*. I posit, though not as a central hypothesis of this work, that much of what we call thinking—that accomplished by our notion of the conscious mind—is in fact linear in nature. This tendency is increased, I believe, with training in rational thinking, where we learn to make arguments that are of necessity linked by a train of causal connections. This is, in short, a symptom of the modern approach to social organisation. According to Parker et. al.:

Modernising power techniques meant adopting the generalising, analytical approach to all problems encouraged by literacy; attacking ignorance, inconsistency and inefficiency...In a world understood as universally subject to the laws of science, modernisation broke reality down into bits which might be profitably rearranged into new combinations. Education had to be developed to teach, not the eternal truths held dear by the many local low cultures, but generic techniques for analysing and manipulating reality. (Parker 2003, 159)

I am not suggesting that rational or linear thinking is bad, but that we consider how complete reliance on the approach may be divorcing us from our perceptions, thus limiting our view of reality, in general, of music, in specific, and more specifically still, of rhythm. Nor am I suggesting there is no truth to be gained by rational argument, so let us believe what we want and enjoy the ride⁷. I am rather suggesting that analysis of music as a real phenomenon is profoundly multidimensional, as is the moment to moment reality we all cope with. It is Toro's contention, stated above, that much of the world's music, in particular those older musics that have developed mostly outside the influence of the Western Classical tradition, demonstrate their multidimensional conception in the field of rhythm, and that by allowing our experience of them to be moulded by less-than-competent conceptual models is a common error. By reminding ourselves of Žižek's parallax, we attempt to lessen the

⁶ I will attempt to replace this term in a later discussion; see Chapter 0, page 68.

⁷ Or, in Daniel Dennett's more acerbic estimation: "Postmodernism, the school of 'thought' that proclaimed 'There are no truths, only interpretations' has largely played itself out in absurdity, but it has left behind a generation of academics in the humanities disabled by their distrust of the very idea of truth and their disrespect for evidence, settling for 'conversations' in which nobody is wrong and nothing can be confirmed, only asserted with whatever style you can muster.(Dennett)

chance of going off the rails into our partially useful, fantasy concepts of reality; losing sight of experience as it is presently unfolding, we become literally, 'lost in thought.' On the contrary, by attempting to stay centred about, "the gap between the subject's phenomenal self-relating and the biophysical reality of the brain," we embrace a multidimensional perspective, and take one step closer to reality. (Žižek 2006, 10)

In this case the multidimensional perspective applies to the simultaneous consideration of concept and perception, in other cases to come, the multidimensional perspective involves simultaneous consideration of multiple metric references.

Power

Still in the realm of philosophy, the concept of power can be used to situate the previous quasi-political discussion. Though I am hesitant to suggest a struggle between the Western Classical and other traditions, or that one or the other is better, it has already been hinted that the European perspective on rhythm has potentially distorted the common approach to the phenomenon, at least among the academically or notationally minded. According to Haugaard:

The fundamental underlying premise of the third dimension of power is the idea that power distorts knowledge. Power, as defined in terms of interests, warps or obscures the truth in a direction which is beneficial to the specific interests of a dominant group. However, the idea of power distorting knowledge also presupposes its opposite: knowledge which is free from power. This is knowledge which is objective by virtue of neutrality between conflicting sets of interests. (Haugaard 1997, 16–17)

He goes on in a later chapter to say that others, in particular Foucault, do not believe there is such a thing as knowledge which can be divorced from power. This would suggest that the very creation and codification of knowledge sets up a relationship of power between those who have access to it, who use it, who proclaim it as truth, and those who do not. I have mused on this situation in my own musical pursuits. In learning various (less analytical) traditional musics of the world (even if I learn them very much in traditional fashion) and subsequently analysing, deconstructing, and making comparisons across cultural and stylistic borders, am I not attempting to 'own' them in a way that is contrary to their nature, and contrary to the way I was allowed and accepted into the traditions? Is my learning process not contrary to the state of being grounded in the relatively slow evolution that is inherent in the notion of traditional; the state of being passed on and preserved as is, without (external, theoretical) modifications. Even strongly traditional cultures are continuously modified, but when the actors are the former oppressed and oppressor, from the still less and more 'developed', wealthy sides of the earth, might this polarity be analysed as cultural neo-colonialism? If so, then Toro's ideas and this analysis of them are not free from the same criticism, except that

perhaps, in our attempt to bring those rhythmically complex, aurally transmitted (see chapter 0) musical traditions squarely into the theoretical fold the point of view discussed herein can be someday offered to their practitioners as well.

Linear and Less So: A First Glance

Finally, as the bulk of this work on the harmonic perspective of rhythm works from the contrasting rhythmic perspectives of linear versus harmonic, I will offer a few more pertinent references on the parallel, popular concepts of linear and non-linear thought. Much of the literature on non-linear thought comes from the fields of business, management, or economics. According to Bratianu:

Biological and psychological phenomena, as well as many social and natural processes are nonlinear. When their departure from linear mode is significantly large we must use a *non-linear thinking*. That means to use correlations between output variables and input variables which have *nonlinear mathematical functions*, like polynomials, exponentials, logarithms, sine and cosine functions, integrals, derivatives, etc. Of course, that is a much more difficult approach, but it is closer to real phenomena. The point we try to make is that a person who thinks only in a linear way cannot understand accurately complex phenomena which have a nonlinear nature and he will try to evaluate them using simple linear models. Intellectual, emotional and creative processes are highly nonlinear. (Gardner 2006; Goleman 2006, *as cited in original*) It is a mistake to evaluate them based on linear models. (Bratianu in Martins and Remenyi 2007, 155)

Implied here is the idea that linear thinking tends to be easier and more efficient. It makes sense that the demands of performance, harmonic analysis and reading implied by the western classical canon would motivate people to find the most direct and efficient thinking modality, especially in the process of realizing the already codified (and perhaps, revered) inspiration of someone else. But, as noted above, the more difficult approach can be, “closer to the real phenomena.” In a non-improvisational musical context, perhaps it is the composer who engages more profoundly with a non-linear approach. Also significant, drawing on the oft-cited work of Howard Gardner and Daniel Goleman (Gardner 2006; Goleman 2006) on emotional intelligence, is Bratianu's statement that “creative processes are highly nonlinear.”

Musician and blogger Cecil McCumber defines linear thought as, “a process of thought following known cycles or (a) step-by-step progression where a response to a step must be elicited before another step is taken,” and non-linear thought, as: “Human thought characterized by expansion in multiple directions, rather than in one direction, and based on the concept that there are multiple starting points from which one can apply logic to a problem.” (McCumber) Especially useful for the discussion at hand is the balanced perspective advocated as the end goal:

“There’s a danger in relying too heavily on logic. The danger is in the determination of the starting point. Once a starting point is chosen, there are a limited number of logical conclusions to a problem...for any logical process, there must be a decided-upon truth as a starting

point. And the beauty of logic, is that it allows us to reach an answer from a given starting point. It's easy, however, to rely upon starting points simply because they're what we've used all our lives—starting points that either may be false, or that limit us from finding a much better answer. (McCumber)

The relevance of this perspective is clear and informative: The standard model of rhythm is limited in scope but has been extensively promoted because of its efficacy in transmitting certain types of music, and, it is what people know. The harmonic model does not propose scrapping the current system, but rather choosing a new starting point from which to develop our concept. The concept is not at odds with the system at all, but the inspiration comes from the application of non-linear awareness to other musics of the world that operate from a more intuitive base. Coming from a rationalist background, I tend to feel intuition as potentially incomplete and perhaps lacking consideration of the full scope of a problem that should be examined element by element. But in some cases, coming from a broader, less focused awareness, perhaps an intuitive stance allows for perception of elements that the rational process ignores. The application of a multi-metric awareness for bolstering rhythmic perception will be discussed in the section, "Perception" (page 183).

Non-linear thinking, as discussed here calls to mind the more commonly used term, 'lateral thinking', coined by Edward de Bono, in 1967. (De Bono 1970) Of course, lateral thinking might still proceed step by step, but the steps are not necessarily joined by explicit causal connections. Non-linear thinking implies that multiple thought processes are occurring somewhere in consciousness, as appears to happen in intuition. These might be temporally linear, but logically non-linear. (Damasio 2008, 187–89)

As for the potentials of lateral thinking, I find the following in my experience with the Harmonic Perspective of Rhythm: 1) The more I experience it as a primary model of musical organization, the more obvious its candidacy as an underlying, unifying vision of rhythmic practice; 2) Certainly for those musicians who are open to and desirous of adding rhythmic dimensionality to their practice, these ideas might lead to previously overlooked or missed observations about the nature of rhythmic organization; and 3) This new perspective, through a few simple adjustments to common paradigms, promises a new level of engagement with rhythm from those on both sides of the theoretical fence, and a significant connection between their implicit and explicit experiences.

Summary

In summary, I have suggested:

- 1) that constructed knowledge and its many related terms (explicit, conceptual, propositional, formal, linear and theoretical knowledge, epistemology), is a powerful and uniquely human tool facilitating most of our interactions with the world, the study of music among them;

- 2) However, constructed knowledge will always remain one step removed from the actual experience of reality including our experience of what it feels like to do something well;
- 3) A combination of these two modes of interaction with the world is ultimately necessary to be a fully capacitated human, and, particularly, musician. David Elliot's praxial 'thinking-in-action' is an informative concept for musicians and educators looking for ways to make this combination;
- 4) Being cognizant of this perceptual orientation, we can choose to see the difference between these modes of cognitive engagement as a gap, a parallax, the complete abolition of which—though we may perpetually attempt to narrow its divisive span—is not possible. This is akin to the scientist's perpetual search for verifiable truth, all the while acknowledging it is a task without end, and thus finding peace with mystery;
- 5) Furthermore, ignorance of this dual perspective leaves us open to the tyranny of one or the other. Though I am not opposed to the search for oneness, or a non-dual perspective, complete reliance on it in music can leave one without reference to much helpful, theoretical, foundational knowledge. On the other side of the gap, we are at the mercy of taking as gospel whatever conceptual legacy in which we find ourselves without reference to our own experience and insight regarding the potential true nature of that experience; this is the danger highlighted in Toro's comments above and examined throughout this work: The standard approach to rhythm in the highly theoretical system used in the West has been missing some important experiential realizations;
- 6) This straddling of the parallax is one of several examples to be discussed herein of the intentional application and development of a multidimensional perspective, akin to the experiential perspective discussed above (as reality is always multidimensional) and related to non-linear thinking, 'thinking outside the box,' and so on. For the most part, the multidimensional concept will be applied to the development of rhythmic skills and awareness, and musical structure, but it is, significantly, also behind the generation of the theory under scrutiny, the harmonic perspective of rhythm.

The Harmonic Perspective of Rhythm

The research is constructed to test the applicability of the harmonic perspective of rhythm as a paradigm for understanding rhythmically complex, relatively unfamiliar, non-Western music. This theory is not new but is not mentioned as such in academic literature, therefore a description follows.

Metre in music is normally taken as the constant by which all other temporal phenomena are measured. If a piece of music is said to be in *'three'* or *'four'*, this implies that there is a constant pulsation which is delineated into the appropriate grouping of *three* or *four*. This grouping is usually based on a clear repetitive cycle inherent in the repetitions or phrases of the music. However, many of the musics of the world, notably those of the African Diaspora, suggest or clearly demonstrate several concurrent metric cycles within the same span of time.

In order to expand the traditional, Western European-based system of conceiving and conceptualizing metre, this study will investigate the potential of a harmonic conception of metre. That is, the normal time span during which the basic elements or patterns of accentuation⁸ of the music repeat—what would have been counted in the above discussion as *'three'* or *'four'*—will now be taken as *'one'*. This *'one'*, regardless of its relative duration, will be counted as the fundamental frequency. Other, 'harmonic' frequencies (which by definition are integer multiples of the fundamental)⁹ will be generated from this fundamental frequency. Thus, along with the fundamental repetitive time span, other cycles or concurrent metres of *two, three, four, five, six, seven, eight, nine*, and so on, will be recognized as potentially important for the analysis and aesthetic mastery of the piece in question.

Although several of these metric cycles are uncommon in the music of Africa and the West, they are not unheard of. What is different about the harmonic perspective, however, is that several or all of the cycles are considered at the same time. We do not limit ourselves to playing in *two* and subdivisions of *two*, or *seven* and subdivisions of *seven*. *Two, seven, three, five* and the rest are all heard, felt, and available as material for improvisation or composition.

8 Much of the literature on non-Western (and particularly African) music suggests that the accent pattern usually taught as part-and-parcel of the Western concept of metre is not applicable outside the music of Western Europe, therefore advocating that the idea of metre be left out of the discussion. I would argue that the underlying concept of accentuation is what should be reserved for those musics to which it is appropriate, in particular those in which the aesthetic locus is melody rather than rhythm. In rhythmic music such as that of the African Diaspora and India, the beat structures (or several concurrent ones, in the view of this study) around which the music is organized are most clearly delineated and understood as marking cycles of repetition, *not* patterns of accentuation.

9 For a definition and related information, see ("Harmonic" 2017)

A physical phenomenon that illustrates this perspective is that of the harmonic series with regard to pitch. When a pitch is sounded by setting a resonant material in rapid, vibratory motion by striking, plucking, or blowing across it the lowest note produced is the called the fundamental note. This is the note by which we determine the pitch name of the sound produced. Making up the sound we hear with that fundamental, however, are a theoretically large number of other pitches created by vibrations at other, higher frequencies. These other, higher pitches are often referred to as ‘harmonics’ or ‘upper partials.’ Thus, when the one note is sounded, other frequencies of varying intensity are also set in motion. These pitches are all sounding at the same time. All the pitches of a musical scale can be derived this way, as demonstrated by Pythagoras. Furthermore, it is the balance of relative intensities of these harmonics that creates the different timbres of different sound sources¹⁰. This phenomenon, if slowed considerably¹¹, is the harmonic perspective of rhythm: Many frequencies happening concurrently and thus, interacting.

At much faster vibratory frequencies, we hear pitch, at slower frequencies, rhythm. In the words of Stephen Jay:

...I have observed that harmony (pitch) and rhythm are really the same “thing”, happening at two radically different speeds. They are aspects of each other. Harmony can be converted into rhythm and vice versa, and the special features that make each of them work as music, are translated analogously between their respective domains. The two seemingly diverse elements are really an occurrence of the same physical phenomenon, follow identical mathematical rules of consonance, and coincide in the effect of specific characteristics, across the range of their musical activity. (Jay)

With this brief introduction, I will proceed to other important considerations before returning to the subject in more detail in, “The Harmonic Perspective of Rhythm Revisited” (page 84)

10 This is why two instruments such as trumpet and violin sound different, even when playing the ‘same’ note.

11 For example, ‘middle C’ has a fundamental of 262 Hz, or 15,720 vibrations per minute. Divided by 500, the frequency becomes 31.4 vibrations, or beats, per minute (bpm). This is a rather slow for music, but two beats to the metric cycle would be counted at 62.8 bpm, somewhere between *Largo* and *Adagio*. Three beats are counted at about 94 bpm, and so on.

Subject-Centred Ethnography

This study was originally conceived as an auto-ethnography. This approach was selected long before confirmation of Toro's extended visit to South Africa. The quality, quantity and character of the data generated during my prolonged interaction with Toro, however, was suited to exposition as an ethnography of him. This approach has hopefully managed to generate an inspiring, relatively truthful view of Toro as an artist and thinker about music.

Nevertheless, I had gathered from previous life and musical experience that much of the important knowledge acquisition in this case would require an *experiential perspective*. Instead of relying solely on the experiences of Toro and the requisite translation to a general audience, I chose to draw on my own experience for a significant quantity of the data. I can thus reflect on the information and issues without mediation. I arrived at this methodology as it seemed the obvious way to be able to describe with any depth or subtlety Toro's theories, concepts and approach, and their application to a real world musical understanding and/or pedagogy.

In other words, though the study has become an ethnography of Efrain Toro and his unique perspective on rhythmic practice, Toro's approach to rhythm and the difficulty of his key exercises still pointed to the essentiality of an experiential engagement with the material as a prerequisite to optimum comprehension. This along with the sometimes-esoteric language he used to describe his realizations, as well as the wide-ranging nature of our dialogues, all indicated the retention of a self-reflexive approach. This approach has allowed me to present the results of my own engagement with the perspective under scrutiny. This is a valuable or even essential methodological stance. In practice, there can be considerable overlap between the original intended methodology, auto-ethnography, and the current choice; a subject-centred ethnography can be self-centred as well. (Rice 2017, 116) The two approaches also share some of the same philosophical underpinnings, namely, the pursuit of truth not as an absolute but as relative to the situation and perspectives of the actors involved, in the tradition of phenomenological hermeneutics.

Hermeneutics, with its, "attention to situated interpretations and multiple truths," (Rice 2017, 11), allows me to present, with some rigour, the personal findings I have gathered in my own engagement with my well-informed but still personal experience of Toro's material. Furthermore, this perspective allows me to present some of Toro's own multi-dimensional, liminal perspectives, which, by nature, are not categorize-able as 'this' or 'that,' but which lie rather somewhere in between.

...(Hermeneutics) provided the philosophical basis for writing self-reflexively about the self-knowledge generated during fieldwork and the hermeneutical arc that all field workers travel along. Self-reflexivity in the form of first-person accounts for research

processes and insights have figured prominently in book-length musical ethnographies since the efflorescence of the genre in the late 1970s. (Rice 2017, 11)

Rice goes on to describe his own engagement with self-reflexivity in two ways: This approach allowed him to offer his own interpretation of song lyrics, alongside that given by his informant, and, it gave him the latitude to explain his process of learning the Bulgarian bagpipe. His teacher's instructions, though ultimately effective, left little in the way of theoretical procedure to be documented and analysed; he was told, for example, simply to have, "bagpiper's fingers." This second application has much in common with my own experience attempting to make sense of Toro's perspective. Although Toro's generous offering was by contrast full of theoretical and technical advice, in the end it was up to me to interpret my own experience of it, alongside the documentation of his ideas (yet another level of interpretation and selection) as well as the application of them to known music traditions. Toro seems to have realized as much; he said on several occasions that the experience was my own. He also insisted we cannot force someone else to have a perceptive realization, such as hearing the upper harmonics of a tone on the piano, or hearing the analogous 'upper' metric structures in an improvisation. (Toro 2012m)

Debunking Objectivity

To some, this methodology may appear to be an excuse to write about whatever comes to mind, without focus or hypothesis test. Naysayers might deride self-reflexive ethnography as un-scientific, subjective and therefore unable to enhance humanity's store of provable knowledge. This sort of condemnation can be dismissed, however, on two fronts, general and specific: First, the sensitive critic, upon reflection, must concede that there is really no such thing as objectivity; this applies to observations of the physical and social worlds. In inquiries concerning the natural, physical world, scientists do aspire to eliminate personal biases, emotional involvement, and so on, to the extent that is possible.

In the self-reflexive method, however, personal biases, emotional involvement, and the like are not eliminated, but rather examined and analysed, quite possibly as subject matter in their own right. Qualitative research, though it fell in and out of favour in the course of the 20th century, is no longer a far-fetched or controversial subject. Qualitative modes of inquiry may not prove cause and effect laws about the nature of reality, but that does not mean the information they present is not knowledge. Qualitative research is based on the premise that there are many kinds of knowledge and many ways of knowing. Narratives are in many cases more informative than pure, prove-able relationships. They may not represent truth that can be carried to all similar circumstances, but they

very well may present something that resonates with and informs other people, in other circumstances. As James Clifford says of ethnographic writing: "...transcendent meanings are not abstractions or interpretations, 'added' to the original 'simple' account. Rather, they are conditions of its meaningfulness. Ethnographic texts are inescapably allegorical, and a serious acceptance of this fact changes the ways they can be written and read." (Clifford and Marcus 1986, 99) Moreover, a story told is knowledge in and of itself. Knowledge generation is justified whether it demonstrates a significant relationship between variables (or the lack thereof), or whether it consists of potentially meaningful stories, anecdotes and experiences.

The problems of reductionism are also applicable to the social sciences. Ultimately the complete reliance on standard research methodologies would limit the kinds of things and ideas that are investigated—or would create bias; the bulk of research would be about those subjects that are easily investigated with standard models and methods. Likewise the instruments available for research might create a similar bias, whether they pertain to the investigation of physical phenomena (microscopes, autoclaves, spectrometres and such) or whether they are *social science* instruments from grounded theory research—data notes, sorting and classifying, open coding, axial coding, selective coding, etc. (Ellis 2004, 28–29)

I am in not stating that scientific method is outdated or should be done away with, merely that it is very dangerous to assume it is *everything*. It provides a certain type of knowledge, but it is not the extent of knowledge, useful or otherwise. In this project, the experience of a committed thinker about and practitioner of rhythm, in a long-term engagement with the material under scrutiny, is crucial to the exposition and evaluation of that material's potential for the enhancement of humanity's musical knowledge.

This would seem to put the idea of objectivity back into the physical sciences, or nowhere at all. Is there something we can know that is 'mind independent'? Whatever the answer to this koan-like question, when studying human concepts, attitudes, ideas and creation, that is, the products of minds, the question is moot. Again, well thought out, scientific generalizations about the nature of society and human endeavour can be useful things, but the ideas, propositions and imaginings of one person or of a small group people are equally deserving of study and elucidation. A modified, perhaps 'simpler' meaning of objectivity thus comes into play: in a complicated, social science scenario, where the strict isolation of competing variables is not possible, we should not pretend to present our findings without bias or external influence; we might rather strive to present experiential data fairly, without hidden agendas, un-swayed by the influence of social or academic norms. Rice has a similar perspective:

Whereas the starting point for good science is to erase biases and prejudices and to start afresh in some intellectually neutral position, hermeneutic philosophers take as their starting point the notion that human beings are “thrown” into an existing world that enculturates them in ways of being in the world and of understanding the world. What hermeneutics asks of us is not the truth of science but better understandings and better interpretations of the way the social world, as opposed to the physical world, works. (Rice 2017, 10)

Reality is Multi-dimensional

The underlying concept here is that reality is extremely complex; it is too complex for the mind to digest undivided. This realization integrates with the concepts of linear versus harmonic understanding, presented elsewhere in this thesis. Ellis suggests the metaphor of a crystal used to deconstruct traditional validity, as used by Laurel Richardson. (Richardson 1997, 92) In Ellis’ words, “A crystal has an infinite number of shapes, dimensions, and angles. It acts as a prism and changes shape, but still has structure. What we see depends on our angle of vision.” (Ellis 2004, 124) The emotional content, the researcher’s interpretation, perspective, state of mind, and the fidelity of their memory are all factors that figure in the presentation of truth, not just the ‘facts’ of what happened or what was said.

Even realist ethnographers, who claim to follow rules for doing science, use devices such as making composites or collapsing events to tell better stories and protect their participants. Yet, they worship ‘accuracy.’ They say, if it didn’t happen, don’t tell it. Don’t put words into participants’ mouths. But ethnographers do put words in participants’ mouths all the time...By relying on memory, editing and selecting verbatim prose out of context, and then surrounding it with their own constructed analytical contexts...They create the ‘typical’ person or day, the ‘common’ event. They use ambiguous descriptors like ‘most,’ ‘some,’ ‘frequent,’ and ‘few.’ They also reify concepts such as social structure and organizational climate. I did this too in my dissertation, the study of two fishing villages. And, let me tell you, when community members read what I wrote, what I saw as typical was certainly not what they saw as typical. What I wrote told you more about how I organize my world, than how they organized theirs. (Ellis 2004, 126)

By allowing the researcher to communicate openly what they think about the process of data collection, by allowing them to investigate their own views of the process, their own emotional states, their own psychological history, and any other potential contributing factors, self-reflexive ethnography does not eliminate bias. Self-reflexive ethnography allows for consideration of more of the factors that add up to the ‘truth’ of the situation. The goal is to create the richest presentation possible, in a way that engages the reader to imagine how the actual interaction might have taken place in speech, actions, and thoughts, of one, several or all participants. This stance indicates that exact chronological accuracy may even take a back seat to a detailed, evocative presentation of the emotional content, underlying intellectual content, body language, and so on.

Toward the Personal

At the outset, I did not realize the full extent of a subject-centred/self-reflexive methodology's potential application to this and future projects. I was and am still primarily interested in understanding Toro's approach and in transmitting that understanding. But I now see that a significant focus of this work has been to present who I am as a musician and researcher; to give a thorough and honest account of how I got here, including, where relevant, my own successes and psychological stumbling blocks along the way.

In the present study, the 'culture' being studied is therefore Toro's worldview and its relationship to rhythm; it is also his pedagogical beliefs, his exercises and their correct application and relationship to music and rhythm—in short, his method; it is by extension the culture of elite (highly skilled), modern drummers and percussionists, their perspective, approach to improving technical capacity, and quest to push the boundaries of the art; it is the culture of those same modern drummers and percussionists who also embrace a multi-ethnic perspective and influences as does Toro; it is his personality, his stories, his ways of communicating, and so on. It also includes *tabla* teacher Pillay's cultural and technical perspective as experienced by me through our *tabla* lessons.

However, the culture of this study is also defined by my perspective, worldview, capacity to remember and communicate, to perform Toro's and other material, my relationship with him and my life experiences, musical and otherwise, plus my analyses of them. As above, all of this applies, but to a lesser extent to my interactions with Pillay. It is this analytic approach to personal experience which forms the core of the research agenda.

Personal Disclosure/Discretion as Key

While reading Carolyn Ellis' *The Ethnographic I* (2004), especially concerning topics such as domestic abuse or end-of-life care, I found myself thinking about the idea of censorship. Having been socialized and educated in a relatively liberal and intellectual tradition, the word has negative connotations for me because of the implication of an abusive, power relationship. Nevertheless, we all use censorship. Most of our censorship probably takes place at a subconscious level. However, when it comes to subject-centred ethnography, censorship and self-censorship come to the fore as important variables to be considered in the generation of meaningful material. To express my story in all its nuance, the cathartic process of self-revelation now seems an essential element. My observations of technical and theoretical ideas and the dynamics of pertinent relationships are potentially enhanced by the inclusion of the attending psychological drama. The potential also exists for unessential ego-drama; such indulgence would mask the important elements to be conveyed by the topic under scrutiny. This same logic could be used to support a narrower, conservative approach focused

on ‘just the facts, only the facts.’ What the move toward acceptance of subject and self-centred ethnography brings to this discussion is the indication that we as researchers must learn to become more in touch with our motivations and self-concealing tendencies; to determine if the things we hold back are really inconsequential or even distracting to the material under scrutiny, or if they rather reveal essential elements that we leave out because we are uncomfortable disclosing them to our audience. In the latter case, we must decide whether the attendant discomfort warrants censorship, and at what expense to our presupposed desire to present as authentic an account as possible—factually *and* emotionally. This is yet another complex discussion, rendered still more so when we start interpreting the emotions and comfort levels of other participants.

Author's Background

This chapter, in a self-reflexive mode, presents early and more recent life experiences, both factual and perceptual. This data is meant to give a limited picture of John Drace, the researcher, and to present some of my background and its influence on the direction of this study. This includes impressions of my cross-cultural focus, unique perspective as cultural insider and outsider in both the western and other, non-European musical traditions, interest in unified theories of musical and artistic expression, and conception of awareness as a tool for technical and emotional engagement as a musician.

Early Life to University

I grew up in a suburban, middle class, family of five. Though music and musical experiences were plentiful, I did not come from a musical family in the usual, stereotypical sense: One that enjoys music making together from a particular point of view. With two half-sisters, nine and ten years older, my early musical life was rather one of exposure than practice. My sisters and mother would often sing together, participating in school choirs and harmonizing choral and popular music around the home. I had a steady diet of classical music played on albums and on the radio by my mother and other close relatives, and my sisters' collections had me passionate about popular, rock, and rhythm and blues music from an early age, with a bit of jazz and fusion mixed in. We had a piano that I toyed with, but lessons were never mentioned. My mother and sisters studied piano intermittently, along with guitar and ukulele. Much later I discovered that my father was a good piano student as a child, but he dropped it, presumably for his interest in sports and cars, the passions for which I have mostly known him. Although it was apparently not recognized or encouraged in my early development, I have always had a fascination with sound and mimicry; I take great pleasure in the experience of sound in music and in the environment, including bird calls and other natural sounds, those of machines and other man-made devices, as well as the sounds of languages and their accents.

My first attempt at formal music lessons in primary school went badly, though I enjoyed the instrument on my own before meeting the instructor. I remember him as curt and short-tempered. Though I had never had any music instruction, he pointed at the page of music notation and told me to play certain notes on my trombone. I had no idea what that entailed so I just blew whatever I could. He replied, "Wrong! *This* note!" and indicated again. His indications were of no help, but I tried again. In humiliation and frustration, I quit. In retrospect, he must have thought I had had some previous instruction, but he was mistaken, or a very bad teacher, or both. I do not remember any continuing

emotional response to the experience, but I suppose it had some negative effect on me; a later mention by my mother that the trombone in the house was, “so awful!” elicited an unexpected and powerful emotional response in me, even as an adult. Though this experience was a negative one and steered me away from early instrumental fluency, it was also 'instrumental' in allowing my sonic engagement with my early world to be broad and spontaneous, rather than directed by the pursuit of European Classical or marching band music. This is potentially a factor in my later capacity to understand and find satisfaction in music from other cultures of the world; music with different aesthetic loci.

I continued as an avid listener. I embraced the guitar in my mid-teens and took to it with great speed, such was my passion for the music I loved in those years. I brought my guitars with me to the University of California, Los Angeles (UCLA), but did not seriously consider a music major until participating in an exchange program with the *Universidad de Guadalajara*, Mexico. It was on this journey that I began to look more seriously at cultures outside my own, It was also on this journey that I bonded closely with several, like-minded friends, and together we shared a growing fascination for travel, world culture and art. This was a time of reckoning for me, of commitment to the artistic path. On return, I decided to pursue music academically. At first, this meant European Classical guitar, but I later switched to a cross-cultural approach

Though UCLA is one of the original, famous ethnomusicology schools, when I attended in the late 1980s, there was no undergraduate program in that discipline. The closest offering was the program in Worlds Arts and Cultures, with a music emphasis, introduced to me by a student friend from the Guadalajara exchange. In this inter-disciplinary program, the focus was on the so-called, ‘non-Western’ cultures of the world. This was an intentional reaction to the dominance in the various curricula, stronger in those days, of the cultural production of Western Europe. To study ‘Music’ was to study European Classical music, and so on. I joined the World Arts and Cultures programme, in which I spent the rest of my undergraduate career learning and learning about the dance, music, art history, folklore and anthropology of various non-European traditions.

Rebellion and the Search for Meaning

I became quite a convert to this agenda, finding beauty and potency in non-European artistic forms, and irritated by the hegemony of European forms in academia. Perhaps this stance was stirred by the rebellious side of my personality or my frustration at a world full of injustice that seemed to be rooted in European colonialism and its various legacies: slavery, economic subservience, political instability, religious and cultural hegemony. It was also a rebellion against the social and political system under which I came of age. I was defiant of a perceived societal focus on materialism and of

material success as the primary marker of a life well-lived. I was also disconcerted by racism and inequality along racial lines in the communities I had been a part of and in the world at large. I did not respect the political system that thrived on maintaining at least some of these values—empty and unjust for me—at the expense of the natural environment and at the expense of those who cannot or will not compete with the dominant system. This system was the American economic and political system, the product of a modified version of the European worldview.

I am unabashedly criticizing the European and American system, the modern world, ‘the system,’ in an attempt to recreate the young person I was in the era under question. I still hold some of the viewpoints referred to above, but tempered by much more extensive travel, reflection, and a bit of tolerance—for the ‘oppressors,’ as well as the ‘oppressed.’

Perhaps I was part of new generation of university educated, culturally disenfranchised youth, seeking meaning in traditional forms to help fill a void unaddressed by modern society. I was reasonably well cared for and loved, given a good, public education and provided with the necessities and diversions of a fortunate youth. My experience with divorce and separation of family notwithstanding, I cannot say that I was deprived of food, shelter or love. I was quite well-off on Maslow’s famous hierarchy. However, my culture does not really consist of a culture. As a Caucasian American from a family with many generations in North America, I did not grow up with a strong sense of cultural identity. I would hypothesize that my experience is exemplary of a subset of the society in which I was raised. Our culture was the marketplace—the things and hobbies and pastimes that interested us. I would not suggest that this does not constitute a culture of some sort. There are hundreds if not thousands of subcultures within the larger ‘American’ culture: California culture; surfing culture; the various cultures of computer experts or ‘geeks;’ the culture of African dance and percussion aficionados...if there is an ‘American’ culture, is it baseball, hot dogs and apple pie? Is it Hollywood movies? In modern, commercial society, without strong ethnic or geographic ties, one’s ‘culture’ is rather a patchwork of whatever comes one's way, whatever pleases someone enough to persuade them to invest their time and sense of self. They/we allow these certain things to become more or less a part of our identities.

The salient point from my experience is that I grew up without a strong sense of belonging to any cultural or religious group. My own ‘culture’ mostly consisted of people who had a similar experience to mine, raised by television, radio and other media that were produced for mass consumption. This left me with a cultural void, or rather a strong desire to seek out systems of knowledge that seemed to promise depth, organization, or a path to meaning, even if partially constrained by the boundaries or contexts of those older cultures from which they sprang.

Furthermore, I aspired to participate in the creation of something new for my generation. Compared to the more traditional, African societies in which I would eventually live and work, this impulse appears to be rather accelerated in modern, industrialized society, likely owing to the influence of formal education, the push toward independent thinking based on rational argument—“Why should I do it like my parents did? I think this way is better”—and on the barrage of exposure to outside ideas and cultural forms. Of course, many musicians from my generation chose to pursue older, academically entrenched forms in depth, like jazz or classical music. Others of us wanted something new, not fabricated of our own imaginations, but rather sourced from distant lands, from different perspectives. African music is a major source of the popular music with which we came of age (Jazz, Blues, Rock and Roll, Rhythm and Blues, Funk, Hip Hop and so on), with an arguably more intricate rhythmic matrix; for me, these qualities help to give African music (especially that of West Africa and closely related Afro-Latin forms) its particular allure. The image of a treasure hunt comes to mind, seeking secret esoteric knowledge that contributes to musical transcendence.

These personal reflections and the suggestion that my experiences fit with some larger social phenomena might be framed in the terms common to social theory: The drive to be different and better than previous generations is a hallmark of modernism; however, the lack of connection to a strong, guiding root or mother cultural matrix can lead to feelings of emptiness, or lack of the fulfilment and sense of belonging once nurtured through older cultural models and their collateral social networks. I will add to this disorientating combination the critical modern perspective—“Something is wrong here, we must fix it!”—turned on modernity itself. The resultant unrequited need for fulfilment leads some toward postmodernism, “which tends to favour abandoning modernity, modernism and associated universalism, in favour of relativism.” (Parker 2003, 216)

For myself however, the abandonment of modernity was partial at best. Complete and indefinite immersion in a foreign cultural tradition, on the other hand, is a rare and potentially quite limiting commitment. Neither tendency—modernism or pre-modern uni-culturalism—provided me with a satisfactory worldview. I chose to compromise my complete adherence to (extant, ‘traditional’) musical structure (or non-structure) as a guiding compositional/improvisational foundation. A modern or rational faculty was retained while practicing one or several extant cultural traditions, or even in creatively remaking them. A linguistic analogy seems appropriate, with preference for creative expression that takes place from a platform of older, commonly understood devices and motifs. I am, ethically, a relativist in that I uphold the right to exist to any non-harmful platform of expression; I do not, however, resist the tendency to compare and seek out the particularly worthy, interesting or personally moving aesthetic from any older or emerging field; nor do I repress the desire to seek

commonalities, or potentially universal attributes. It is this combination of pre-modernism, modernism (and universalism), and relativism (a postmodern tendency; the embracing of many cultural forms) which informs, I believe, my contemporary worldview as a thoughtful rhythmic specialist. It was through this inclusive theoretical approach, in less conscious application, that I would continue to investigate non-Western music, eventually returning to Western Classical music and Jazz.

Drawing on the work of Anthony Giddens, Rice comes to a similar perspective.

In his (Giddens 1991) view tradition gave to people their habitus, status, and roles, in the process limiting their ability to structure a self outside these given frameworks. Modernity, on the other hand, knocks down these traditional underpinnings and requires all of us to construct reflexively our biographies from a wide array of choices not available in traditional societies. Lifestyle choice becomes not a trivial accoutrement of the bourgeoisie but crucial for everyone living in modernity. (Rice 2017, 116). “What to do? How to act? Who to be? These are focal questions for everyone living in circumstances of late modernity-and ones that, on some level or another, all of us answer, either discursively or through day-to-day social behavior” (Giddens 1991, 70; cited in Rice 2017, 116).

Rice goes on to connect this orientation to the methodological stance of the modernist musicologist.

The self-reflexive project of self-identity in modernity, understood as a social process, provides the rationale and foundation for subject-centered musical ethnography. (Rice 2017, 116)

After finishing my degree, I stayed in Los Angeles one more year, working and continuing to study Yoruba talking drums with master drummer Frances Awe from Nigeria. I wanted out of the big city, so I moved to the far northern end of California and found several other varieties of African world music practitioners. I was pleasantly surprised, in fact, to find the level of knowledge, skill, and commitment that I did among my newfound peers. These were not academics (though some had also studied music at university) but enthusiastic hobbyists. They were afterhours musicians and dancers, of various creeds and colours, who were doing a fair job of recreating the repertoires they were learning from occasional interactions with visiting African and Afro-Cuban professional artists. They were focused and passionate, not distracted and passive, forging identities and social networks apace with the development of those preferred, translated cultural practices. I thought I knew a lot from the various ensembles and classes I had done at University, but I had much to learn from these small-town enthusiasts. My surprise and subsequent observations in the small town of Arcata contributed much to my realization of the aforementioned phenomenon of enthusiastic, cultural transplantation (modern, university educated Westerners embracing especially African diaspora music) that I see operating in the US and Europe, especially, and of my own theoretical stance.

Questioning Motivation: a 'Spiritual' Resolution

Date

I am sitting in a barn full of bailed hay adjacent to the house I share in the Arcata Bottoms, lowlands on the road to the Mad River Beach, before it joins the twisting bank of the Mad River on its final stretch to the sea. This is a modern, steel barn used by Frank, the owner of the green pasture all around us, the cows out in those lush green pastures, and of the house my friends and I rent. I have been studying Shona Mbira music for nearly year now , and have taken to the few songs and variations I have learnt well enough to enjoy playing alone. This gives me great pleasure. Perhaps it is the wide-open countryside or the gentle rhythms of the gentle cows, genetically pre-disposed to co-exist in a great herd as they are, or the soft, gentle, chime-like tones of the Mbira, their lines weaving poly-rhythmically around each other, separate or together, depending on your perspective. Maybe it is the smell of the hay or my secluded spot, ten feet off the ground on the fragrant bales. Whatever the inspiring conditions, I find myself thinking once again, 'Why play music anyway? What's the purpose, if not to impress people and build my own ego? Am I not just looking for a way to feel better about myself, and if so, is it not an empty pursuit, bound to fail?' ¹²

I have engaged intermittently with Buddhism and meditation since I chose it as the subject of my first high school term paper. These thoughts in the barn were at least partially inspired by my Buddhist leanings. I should explain that for me, Buddhism in its original form is more psychology than religion. It is about knowing oneself and the tendencies of the mind, to as great an extent as is possible. The goal of complete self-knowledge, if that is possible, then brings on the fabled religious experience of permanent transcendence. It is this possibility that also inspires some people to religious devotion in the practice of meditation and self-examination as prescribed by the Buddha.

Awareness

The parallels in this study to this awareness-seeking perspective are many. There is the self-reflexive approach itself, where all observed or even imagined experiences are potential material for documentation and analysis. As the mind is the only filter we have to translate experience to ethnography, it should not be left out of the equation. To strive for objectivity in our observances is a noble, if impossible goal. To move in that direction then, observance of the observing and processing mechanism—the mind—is valid and, I believe, called for, whether or not it is documented. The task of meditation is to let the mind settle enough that we can see its patterns and preoccupations, its ten-

¹² This is, in essence, a 'quote from memory', hence the use of the present tense. It is italicized so as to distinguish it as neither part of the current narrative nor as a quotation from another source.

dency to jump all around when we may think there is continuity of thought, and its tendency to focus on those matters that hold personal importance for us. These patterns of thought are at odds with the goal of objectivity. It is an imperfect science, but it is the basis of all contemplation, scientific or otherwise. As such, self-awareness and admission of biases should be cultivated by anyone attempting to present academic 'truth.' For me to omit this aspect of my own perspective, for example, would sacrifice some of the truth of my internal process, which is the generator and/or translator of all that is presented here.

Awareness is also at the core of the experiential perspective. Without self-reflection, no explicit knowledge would be generated, and the implicit would remain unconsidered. It is through the process of asking, "What do I do?" and "How do I do that?" that we begin to generate ideas—perhaps even answers—that can be transmitted to someone else for their own evaluation and possible use. The deeper and more consistent the awareness, the more material is generated, with perhaps greater odds that we will hit on some truth, whether it be solely personal or useful to some wider audience.

For me, an awareness perspective has parallels in many of Efrain Toro's ideas as well, both technical and philosophical. Throughout my lessons with him he stressed the idea of starting one's music practice anew every day. By this he explained that he has committed himself to checking that each day he starts by touching his instrument with a correct and fluid motion, one that completely releases the energy generated by the movement. Here we are in the world of experience, and this might seem like the talk of a mystic to someone who has not experienced the phenomenon. I can say from my own experience that the seeds of this idea grow with focused practice into a deeper and more consistent awareness of this very phenomenon. The energy used will never be completely released, but the idea is that energy must not be held in by muscular tension (which might be related to psychological tension); this gradual awakening is accompanied by the realization that freedom from (unnecessary) tension is not learned completely but rather developed over a lifetime. It is inherent in this approach that the process is continually re-examined and begun anew—this is the awareness algorithm. Here it operates with special emphasis on the idea that any technical, movement goal is efficiently and continuously developed through conscious awareness. It is through awareness that we determine whether and to what extent the limbs are relaxed and the energy passing freely through them. While there may exist people who find great technical ability without much 'thinking,' Toro has strongly suggested to me with his words and abilities that this approach

will likely have a 'low ceiling.' To continue to progress throughout one's lifetime, perhaps to achieve greatness, it seems necessary to seek more than unconsidered trial and error can give.¹³

When he says he 'starts over,' everyday, Toro also explains that he starts with very basic material, grounding himself and his body in the central pulse(s), to which all other elements are, or should be, subject. His rhythmic philosophy, hinted at earlier, is one of perspective. This he compares to the development of visual perspective which took place in Renaissance painting, when artists learned to produce drawings and paintings in which all objects in a scene are seen in spatial relation to the observer.¹⁴ Similarly, only through a strong, grounded centre can other syncopated, polyrhythmic and polymetric elements take on their differing, counter rhythmic roles, for the listener as well as the performer. Though he has come to be known for his command of very complex, polymetric combinations and permutations, Toro insists that the mind be centred in the most basic element, the pulse¹⁵.

On a related, more philosophical note, Toro also talks of the, 'field of possibilities.' By this he means that commitment to one musical path, like the mind committing to one idea, limits the potential to consider other paths. From this pre-commitment experience, which he also refers to as, 'the one,' (meant in a metrical as least as much as a meta-physical sense) all things are possible. In Buddhist or meditation narrative, this is similar to the idea of the 'void,' or, 'nothingness.' In physics, philosophy/ontology as well, this idea would correspond to that which is not matter, energy, or empty space. It is the concept that for something to exist, it must also be possible for it not to exist, and before it did, there was nothing. Therefore, somehow, all of creation is in fact dependent on the concept of nothing, of non-existence. (Genz 2009; Sartre and Barnes 1992; Kelsang Gyatso 2011)

Lama Encounter

From my own experience, I am reminded of a meeting with Tibetan Lama, Akong Tulku Rinpoche. I was among other interested visitors and volunteers at the Rokpa Buddhist Centre in Harare, Zimbabwe, during the Tibetan Lama's bi-annual visit. I was an occasional visitor and participant in lectures and meditation sessions there, and was fortunately able to attend on this rare occasion to be

¹³ As mentioned elsewhere (Constructed Knowledge and the Experiential Perspective), actions are also considered knowledge in contemporary thinking. (Elliot 1995, 55) An integrated approach between explicit and implicit knowledge is implied.

¹⁴ For a video explanation preferred by Toro, see episode three from James Burkes' series, *The Day the Universe Changed*, especially from about 20:00 to 30:00. (*The Day the Universe Changed*, #3: *Point of View* 2012, available on youtube.com)

¹⁵ I argue elsewhere that a central tenet of the philosophy under scrutiny is polymetricity, or awareness of several metric references on theoretically equal, as opposed to hierarchical, terms. Toro's method comes to this awareness several steps after the beginning stages being discussed, with the eventual centre being on 'one', the metric cycle itself.

near a potential ‘realized being.’ I felt a bit the fly on the wall, sincerely interested though I was, and not brave enough or dedicated enough to queue for an audience with the guest of honour. Then, quite abruptly, a film-maker and sometimes musical collaborator friend of mine said, “Have you talked to him yet? He’s really easy going, just go talk to him,” and ushered me by the shoulder right to the open chair next to him. I should mention this Lama had a reputation for being dry and stern, not quite the warm, smiling wise man we might be used to from documentaries about the Dalai Lama. The queue had dissipated and with not more than a few seconds notice I was now in semi-private consultation with the Lama. I could not think of much to say, but felt I must say something, so I turned to my usual topic of conversation, music. I explained that I was a musician and he suddenly got very excited, straightening up and snapping out, “Oh, good! What do you play? Guitar?” I explained that I had previously been a guitarist, but that I presently played percussion and piano and composed. With a sudden, relatively bubbly demeanour, he continued, “Oh, ok. No matter. So, when you practice your music, that is your meditation!” I was taken aback, happy that my story had brought such enthusiasm from the stoic wise man, and happy for the few, choice words of wisdom. I thanked him and took my leave.

I think it possible that Rinpoche's demeanour seemed to change so abruptly because he saw the potential that music offers as an awareness-centred occupation. Any daily activity can be an opportunity to practice awareness, but for reasons stated above, perhaps music demands it. Toro told me that the *tabla* virtuoso Zakir Hussain has also said that his practice is his meditation. (Toro 2012g; Hussain 2011) This idea is significant in the present context as it suggests that awareness of the mind, or mindfulness, can be applied to musical endeavours, transforming them, if the practitioner is so inclined, to spiritual endeavours. By spiritual endeavour, I mean an activity of mind that brings on moments of transcendence, of awareness beyond the normal realm of day-to day consciousness. For those who are moved by the idea of a spiritual life or a spiritual practice, the inclusion of music in that practice is an opportunity to combine a pastime or profession with a deeply held, meaningful life path. The mechanism, in this case, mindfulness, goes both ways. Music practice can be used to deepen one’s knowledge of themselves and of the moment, and can be dedicated to the larger world outside one’s own selfish impulses and desires. Likewise, mindfulness, the desire for an ever calmer, more accepting, more aware and less personally absorbed mind can contribute to one’s capacity for music, by accommodating the patience and insight required to overcome technical and interpretative obstacles, and by training the mind to be more restful, insightful, spontaneous and relaxed. (Cleary 1995; Nairn 1998, 1999; Akong Tulku 1995; Nhất Hạnh 1999; Thubten Yeshe 2000; Kornfield 1993)

Recent research suggests that what many tend to think of as consciousness, a background of continuity with which we observe and process the world, is actually more of a continuous stream of more or less related thoughts bombarding the thinking structures of the brain. (Robinson 2011; Damasio 2000) From this relentless and sometimes random storm of thoughts, we convince ourselves that there is a solid 'me' and a solid 'you'—personalities that exist. In 'thinking about the thinking' we convince ourselves there is some 'thing' that we have, that is 'me.' Perhaps awareness then, is a myth; maybe awareness is just more thinking that we convince ourselves is somehow 'higher' or more profound than thinking about what we ate for breakfast or what colour to paint our toenails. Still, it *feels* like something more. In my experience, awareness *is* the thinking behind the thinking: The active state of observing the mind *and* the body, and paying attention to their habitual tendencies, thereby giving us a bit more choice in how we choose to act. Awareness is observation...of the observing mind itself. It is maturation of the mind. When children mature, they (hopefully) learn to reflect before they make important choices. 'Should I finish school?' 'Should I drive drunk?' 'Should I swim in the sea during a hurricane or play golf in a lightning storm?' In developing mindfulness, we deepen this process to include the conditions we observe in our inner life. 'My mind is full of angry thoughts, should I act on them?' 'Nothing is really permanent. My mind is often preoccupied with concerns about my identity and the needs of my ego; Are these thoughts who I am? Should I let them be? If thoughts are not who I am, then what are the alternative possibilities?'

Perhaps there is a continuum that runs from purely physical or 'trivial' matters, to highly mental, intangible, layered thought matrices such as self-reflection of which awareness and 'spiritual' experiences would be examples. All is ultimately based on judgment. Some claim the spiritual is in everything. This brings us back to Hussain's and Rinpoche's statements that musical practice can be meditation. It can be a chance to observe ourselves, body and mind, and a source of reflection on our own habitual tendencies; ultimately, from this perspective, all thoughts, perceptions, and experiences can also be sources of reflection...if one can maintain permanent awareness of one's own mind.

A Controversial Statement

In discussing the significance of personal, mental process in the development of musical skill, I'm reminded of a statement that uses terminology from the 'objective' realm. The great Puerto Rican conga player, Giovanni Hidalgo, stands as an icon in the worlds of Latin Jazz, 'World' percussion, and Caribbean music. He is perhaps the first truly modern conga player, with astonishing technique, the likes of which had not been seen before he showed others that it was possible. Though his background is firmly rooted in Afro-Caribbean traditional forms, I use the term modern because he has

found a way to embrace rudimentary drumming techniques—the modern approach of categorizing technique into groups of essential movements, or rudiments, which are practiced outside of the traditional goal of focusing on repertoire—and incorporate them with Afro-Caribbean folkloric music. I am influenced in this categorization of, one might say, ‘modern ethnic musician,’ by Toro, but it is a phenomenon I spent much time considering before I came under the sphere of his influence. It is this convergence of ideas, in fact, that lead to my interest in Toro, as discussed elsewhere.

The comment I mentioned comes from the DVD, *Traveling Through Time*, by Hidalgo and another exemplary ‘ethnic modernist’, Horacio ‘El Negro’ Hernandez. In the discussion section after their piece, *Juntos*, Hidalgo talks about the way the two have been referencing various older, folkloric and popular repertoires, recombining them and incorporating modern technique, and presenting their work to the next generation, who will then continue the process. Then he pauses and says, “I say something always, and for me, it’s the truth. We are...any instrument, any level, any...artist...we are scientists.” (Hidalgo et al. 2004) English is not Hidalgo’s first language. He is also prone to heartfelt, quasi-mystical flights of praise for his predecessors, praise for his instrument, the beauty of the music, the love he feels when he plays, and so on. The first few times I heard him say that artists and musicians are scientists, it struck a chord in me, but I brushed it off as an off-the-cuff, less than thoroughly considered bit of artistic license, uttered by a great player who is somewhat less of an accomplished speaker. Science, after all, is about un-biased testing and replicable results, about concrete explanations for puzzling phenomena. But recently, while practicing and considering this idea of awareness, it occurred to me that there is a great deal of testing and experimentation that goes into overcoming a technical hurdle in performance practice. I believe this idea is what piqued my interest the first time I heard Hidalgo’s comment. Now, however, I realize that not only do we conduct a great deal of experimentation to find the right course through a technical hurdle, but that the field of experimentation—an individual mind/body system—is not observable to anyone *but* the experimenter, as least not in the complete sense that is required to own and use that system. Outsiders such as teachers can be a great help, but ultimately, the questions, the experimentation and the answers are only fully known to that one individual. Many things still differentiate the process from normal scientific endeavour, of course. Perhaps most obvious is documentation of the experimental process. In the auto-ethnographic realm, Sudnow’s *Way of the Hand* presents one attempt at this sort of documentation. (Sudnow and Dreyfus 2001) In the present research, I have made a considerable attempt to document my experiments, successes, trials and tribulations in acquiring some of Toro’s technical approach, in my *tabla* studies, and in my more casual pursuit of piano technique. I find, however, both in Sudnow’s book and my own experience, there is just too

much to document. The mind has only so many resources and so much attention to devote to these inter-twined tasks: experimentation, documentation and analysis. This is especially considering that technical and musical success—in stiff competition with documentation for the researcher’s time and attention—are pre-requisites for the ‘study’ to generate any meaning. What use would there be in saying, “I tried x technique but I was too busy thinking about it and writing about it to engage with it completely; this may or may not be why it failed to produce results.”? Moreover, even if I manage to shed some light on one aspect of technique acquisition, it will have been for me, in *my* mind and *my* body. Perhaps a scientific study could be applied at a less personal level, such as whether exposure to certain technical advice shows a statistical difference in some measured performance capacity of a certain technique. This could make a valid and reasonable experiment, but it is a long way from music or the process of becoming a musician. What is more, the advice will still have been observed, interpreted and applied by each participant in their own way, in their own mind and body.

These two mental processes—experimentation with immediate feedback and alteration of behaviour in a quasi-intuitive, experiential modality on the one hand, and a tendency towards a more prolonged, analytical and documentary approach on the other—may underlie the stereotypical character types we see around us: the athlete and the intellectual. These prejudices are wrong and potentially harmful; plenty of good athletes are also good students and vice-versa. Still, I meet children all the time, including my own two, who I would characterize as prone either to rapid acquisition of physical skill, and less to observation, verbalization and analysis, and those on the opposite end of the spectrum. I grew up with lots of them. David Elliot echoes this observation in the performance realm:

In domains such as the performing arts and athletics, where thinking effectively in action is what counts, the relationship between procedural knowledge and formal knowledge can be highly variable. Many students grasp principles nonverbally in the process of music making and in the course of seeing and hearing models (practical concepts) of how to perform artistically. Other students require “talk” before they can think-in-action. (Elliot 1995, 60)

It is a common goal in education to stimulate both ends of this spectrum, with the idea that some, ‘get it’ in one realm and some in another. Music, in what has been referred to in recent times as the now infamous, ‘Mozart Effect’ perhaps offers crucial training in both modalities¹⁶.

¹⁶ The ‘Mozart Effect’ usually refers to the contention that listening to classical music, especially that of Mozart, produces a range of beneficial effects, including increased academic performance and even increased IQ. The plethora of claims, products, and public and political debate regarding this idea seems to originate with the work of Alfred Tomatis, and the research of Rauscher et. al., who, in an article in the journal *Nature*, showed that listening to certain Mozart pieces produced a temporary improvement in spatial reasoning. (Tomatis 1991; Rauscher, Shaw, and Ky

A Scientist's View

Concert pianist and acclaimed educator William Westney looks to the chemist and philosopher Michael Polanyi on the (im)possibility of categorically describing, analysing and defining the process of technique acquisition:

Other scientists have also looked to music as a special problem-solving medium and as a means of understanding and representing abstract concepts. Michael Polanyi (1891-1976) was a world-renowned chemist who turned to philosophy in later life and achieved great prominence as a thinker. Polanyi went beyond the objective scientific method in which he was trained when he said that humans “know more than we can tell”: there are important truths which are personal and irreducible and which can never be analyzed or described. This view acknowledges that the scientific method will not always be adequate, since science takes a reductionist approach—one that reduces a big question to smaller, more manageable ones without necessarily ever answering the big question.

To illustrate the shortcomings of reductionist analysis, Polanyi turned to piano technique as an example. In fact, this passage reveals far more insight into piano playing than many books by musicians do! Polanyi understood that since the body will always be more sophisticated than the mind, its workings at a certain level can never be explained by one person to another. (Westney 2003, 218)

The analysis of a skilful feat in terms of its constituent motions remains always incomplete. There are notorious cases, like the distinctive “touch” of a pianist, in which the analysis of a skill has long been debated inconclusively; and common experience shows that no skill can be acquired by learning its constituent motions separately. Moreover, here too isolation modifies the particulars: their dynamic quality is lost. Indeed, the identification of the constituent motions of a skill tends to paralyze its performance. Only by turning our attention away from the particulars and towards their joint purpose, can we restore to the isolated motions the qualities required for achieving their purpose... This act of integration is itself unspecifiable. Imitation offers guidance to it, but in the last resort we must rely on discovering for ourselves the right feel of a skilful feat. We alone can catch the knack of it; no teacher can do this for us. (Polanyi and Grene 1969, 126 in Westney 2003)

Polanyi has captured the essence of making music: good, purposeful practice results in a dynamic and irreducible “act of integration.” (Westney 2003, 219)

Hypothetically, skill acquisition might still be thought of as a scientific endeavour. The acquisition of a skill requires repeated trial, evaluation and modification of the experiment until the desired result is achieved. The desired result indicates that the optimal experimental conditions have been found, at that time, for that mind/body system. Traditional scientists, by applying this method to the outside world, documenting their experiments, and minimizing bias (cross-contamination between the inner world of the scientist and the outer world of the relationships under investigation) are able

1993) IQ was not measured. Recent research such as that by Moreno et. al., suggests that training in music (as opposed to passive listening) might indeed enhance cognitive abilities (verbal intelligence) in children. (Moreno et al. 2011)

to make conclusions about the hypotheses they choose to investigate. These conclusions are presented to the larger community as a predictable relationship which can be demonstrated by anyone able to furnish the appropriate experimental conditions. The artist shows his or her results by being able to demonstrate a skill. The difference here is that anyone wishing to replicate the skill will have to design their own experiments within their own mind/body system. The requisite replication of the experiment only takes place within one mind/body system at a time.

Back to, 'Why?'

So, I was in the barn, playing the *mbira* for myself and thinking, 'Why play music anyway? What's the purpose, if not to impress people and build my own ego? Am I not just looking for a way to feel better about myself, quite possibly at the expense of others who are less skilful, and if so, is it not an empty pursuit, bound to fail?' The answer which came to me, which satisfied me, was that in playing music I am acting as a channel of something beautiful, something not entirely of myself (something *natural?*); I am taking inspiration and a bit of knowledge, creating sound, organized sound, and broadcasting it back to the universe. I had a profound feeling that it mattered not whether anyone ever heard what I was doing, it was still relevant and still constituted a positive contribution to humanity, perhaps to something greater. This was a personal realization, but born of the application of conscious awareness to the choice of musical and life path. Music became, in that moment, a primary instrument in the quest to develop ever-finer awareness. It became my yoga.

I stayed in Arcata only three and a half years, but it seemed more. I did well in the music scene. I was asked by friends to teach. I played in bands. I played in two or three dance classes per week and played with friends in study groups and at parties. All together I often played six times a week, and was praised now and again by visiting African teachers. There were ups and downs: conflicts with other musicians; relationships with dancers; ego games and jealousy; great highs and sadness. I loved my new home, and thought of it as home. But I felt I needed more. I needed to go to Africa. After finishing coursework in International Development Technology, I had a way to work in Africa, for an extended period. With French training and small-scale development coursework, I felt fortunate to be offered a post with the US Peace Corps in Côte d'Ivoire, right in the heart of West Africa, and I accepted.

Africa

After two months of language, cultural and technical training in Senegal, I arrived in my new home country with the rest of my training class, most but not all of them just out of university. I was placed in the far northwest of the country, in a small village called Zeguetiela, about 65 kilometres from the regional capital of Odienne. I should have been ecstatic. I was just a few dozen kilometres

from Mali in the North and a bit farther from Guinea in the West. I had been heavily involved in Mandeng (*Jembe*) music in my last few years in America and here I was very close to the heartland of that tradition. The people called their language *Jula* (French spelling, *Dioula*), but they called themselves, *Malinke*. *Jula*, I would come to learn is just a word for ‘merchant,’ or ‘trader,’ but the language is one of many variants of the widely spoken, Mandeng language group. (Other, mutually intelligible dialects include *Bambara*, *Maninka*, *Malinke*.) I had a head start learning the language in training. As mentioned, I *should* have been ecstatic, to be very near the core both geographically and socially of one of the most popular and virtuosic African percussion traditions in the world. When I heard the people play, however, I was disappointed. It was not that they were not capable, but they would play the same rhythm for hours at a time and use the same solo embellishments to the same dance steps in a similar fashion. Venturing into such an experience today I would easily be better prepared than I was then. The available literature then, in the mid-1990s was much less, and the internet was in its infancy. Now, anyone as passionate about the music as I was would have access to sources about the nature of the music and the difference between rural and urban interpretations. I had learned from excellent Guinean, Malian, and Senegalese virtuoso teachers in the USA. These people had been chosen for internationally touring dance companies and played in a modern, fast style, developed to impress foreign audiences in staged performance settings. The village style of playing is not rushed, as its purpose is to enliven long ceremonies and celebrations. These are events the people choose to attend because of their deep personal and cultural meaning, and the music played is one aspect of a complex and multi-dimensional experience, one that includes dancing and the singing/recitation of important stories, proverbs and genealogies. Unbending tradition can be a topic for hot debate, as the mindset required for its preservation can also assert itself against change of any kind. Herein lies another clash of contemporary and traditional values; as influence of industrial society has advocated musical change, it might also advocate changes to protect human rights, or access to modern healthcare and sanitation. As a water and sanitation volunteer in this very rural, mostly illiterate, un-electrified and traditional Muslim village, I was also immersed in this dichotomy.

I have always been cautious, however, to advocate an approach from industrialized society at all costs. I would sometimes tell my friends in the village, when they would ask about the outside world, that they in fact lived very charmed lives in many ways. There was no obesity or lack of food; everybody was strong and fit; they were proud to produce everything they needed to live; the people sang while they worked and talked, joked and laughed all day; they had their own unique dialect, different from those of villages even 15 kilometres away; they had no inner conflicts about

where they came from or who they were in the world; they shared all material possessions, to the extent that everyone had basically the same, which was almost always enough to survive, and no one was what we would think of as remotely wealthy. History, role, and responsibility were all defined for those willing to accept their lot. The gnawing inner turmoil that seems to plague us in the industrialized world seemed for the most part absent. One thing the villagers lacked however, perhaps felt more by the youth, with their energy, ambition and glimpses of the wider world, was the economic power to escape, should they so choose. They ostensibly lacked the freedom to be somewhere else, to be something else—not completely, but the odds were stacked high against those who dreamed of the lives they saw now and then on the village nurse or teachers' battery powered televisions.

The Contemporary Struggle

I am of two minds regarding the superiority of the contemporary, materialistic and capitalist approach to life. I am not able to suggest an alternative, but I do respect and wish to preserve the legacy of traditional cultures. For better or worse, traditional, rural culture in its refusal to change at all but the slowest pace is the source and guardian of much wisdom concerning the natural world, concerning human nature and human relationships, and concerning music. It is the source of traditional music, and without understanding the source, it is impossible to understand the music in all but a technical sense. Mamady Keïta, as perhaps the most celebrated African drummer in the world, is no stranger to the stage or the outside world. However, he sees the traditional/modern dichotomy thus:

Today the true traditional rhythms are only found in the villages. Many of the young people from Conakry (Guinea's capital city) learn about the djembe only through the ballet¹⁷, and know nothing of how it is played in the village. In the capital, there might be about five musicians who know and play traditional rhythms.

As far as I am concerned, people commit a grave error when they mix traditional rhythms and ballet rhythms to the point that they cannot discern one from the other. Meanwhile, there are many African adventurers who spread these rhythms all over the world and proclaim them to be traditional rhythms.

The real traditional rhythms of a village are never changed. Before a traditional rhythm changes "men will give birth to children!" This is so because, for centuries, an oral tradition has existed that has nothing at all to do with fashion, but everything to do with our history.

If we do not pay close attention here, we will destroy our identity, our tradition, and our history. (Billmeier and Keïta 2004, 42–43)

¹⁷ Keïta is referring to experience gained through African dance companies such as *Les Ballets Africains* (The African Ballet), which became Guinea's national ensemble after that country's independence in 1958. ("Les Ballets Africains: African Culture for the Modern World")

The Modern Takes the Lead

With time, I became fond of the village celebrations and style of music. Over the course of the two years I spent in Zeguetiela, I played with the local drummers and with *bala* players (*balafola*) on a few occasions. However, aside from my initial comparison with the fast, flashy playing I had known in the US, there were several other factors which kept me from a more thorough immersion in the village music. The most important of these was the relative lack of music making. As poor peasant farmers in the drier Northern region of the country, the people worked virtually all the time. Village celebrations with music took place maybe once per month, on average, or less. I also began lessons with Cisse Seydou on the *bala*. Seydou would become one of my dearest friends and musical inspirations, but our music lessons were mostly esoteric, mostly in private. I wanted to be playing more regularly.

I did play with the villagers on many, memorable occasions: Village wide celebrations for the end of Ramadan, full moon dances around a giant bonfire, and large work parties in the fields. People sometimes tried to stop me, however, because they said I would get tired or hurt my hands. Likewise, when I tried to show the local musicians some phrases I had learned from their colleagues with modern, (African) ballet training, they would say, “Oh. That’s how you play *chez vous!*” Again, in my frustration, I would tell them, “No! This is *African* music!” They did not believe me. For all the reasons mentioned, but especially because of the relative lack of music making in the village I began to search for musicians in the regional capital, Odienne, whenever I passed through. There I met and befriended the leader of a popular *Jembe* group, Kone Kassim, and a friend from Guinea. I took lessons from them and played with their group for several months and eventually brought them back to the village for a few days. There we played the days away in the relative quiet of the countryside and even put on a show for the villagers one night in the school. Everyone was quite impressed with the skills of my new young friends, even though they played in a style closer to what I had been exposed to in the States. They also noticed that I could keep up with them, enough to accompany them at least, and that we had a friendship and brotherhood in music, regardless of our different races and origins; these two gentlemen even left the 'big city' to come and work with me out in the countryside. My message—that white foreigners could play African music, that I was serious about really learning—must have been a bit clearer. Not long after, one of the regular village drummers, one who had been friendly in the past, Karim, said that he would introduce me to his *Patron*, his master. I said, ‘Sure. Sounds good,’ but, in my naivety, I left it in his hands and never enquired further. Not impressed by their music, I let it slip away. These are the sorts of details I could leave out of this discussion, but I have come to believe it is important for me to explain some of the hidden details, including mistakes I have made and potential sources of regret. It was

only some years later I learned of and acquired Keïta and Billmeier's book (first published in 1999, about two years after this experience), read of the difference between village and modern music, and of the importance of the village traditions. I thought the young men who played in the village were the carriers of the tradition, not thinking there could be a master. I had never seen any of the older people play local music. There were two I knew of who played the *bala*, but they had learned in another region, and I also knew them to be the only ones. I have since read in Keïta's book:

My master, Karinka Djan Condé, was not a famous musician. He lived as a simple farmer in our village. But he was a true master who had practiced the tradition and the magic of this instrument for many years. A master, especially a master of the djembé, must master all rhythms and know exactly when each is played and why. There are also some sounds of the djembé that a master transmits to only one student, who is devoted, body and soul, to the djembé.

My master knew the seven secrets of the djembé and initiated me into these secrets: that was, and is, a great honor for me, and, at the same time, a big responsibility. (Billmeier and Keïta 2004, 34–35)

If there was a true master in Zeguetiela, one capable of transmitting the centuries old secret traditions, I did not meet him as such. I travelled still further afield in the ensuing years looking for the 'real' tradition of the Mandeng. Perhaps I needed only focus on what was in front of me.

Branching Out

In the middle of my second year, I went on a work related, technical training to Guinea. While at the Peace Corps house in Conakry, I met another American who was passing through, Paul. Paul had been taken by West African music in the States and had moved to Bamako, Mali to study *jembe* and *bala*. We hit it off and explored a bit of Conakry together before exchanging addresses and going our separate ways. Toward the end of my time in the village, I took a holiday to Mali and found Paul once again. Here in Mali, in the capital, I took lessons with Paul's teacher Fousseini Sissoko, and found a vibrant music scene, bubbling with the contributions of many ethnic traditions. Just walking the street in Bamako in the evening, we would hear many kinds of different music—from amplified Peulh reed flute wailing from makeshift speakers at feedback volume, like some kind of Sahelian Jimi Hendrix, to Tuareg electric guitars, the heptatonic *bala*, *koni* and Arabic inspired praise singing of Mandeng *Jelis* (griots), the large pentatonic *bala* of the Senoufo, and Bamana, the *jembes* and *dunduns* of half a dozen different celebrations, hired by families of various ethnicities.

Clash of Commitments

I returned to Côte d'Ivoire resolved to finish my service and move back to Mali straight away¹⁸, but I was greeted with congratulations for a new post I had been awarded; I had applied to extend my service as a volunteer leader, establishing a new office up-country from the capital.

Though it was a difficult decision to make, in the end, I chose to remain in service and move to the city of Korhogo. Korhogo, Ivorian capital of the Senoufo ethnic group, is in the centre north of the country, famous for its traditional weaving and sculpture, ceremonies with masked dancers roaming the streets, and *bala* music.

The Mali decision on hold for another year or so, I encountered another disorientating situation; I met the woman who would eventually become my wife. My attention was divided in a number of ways, work—finding and establishing a new office space in an unfamiliar African city—music, of several varieties, and new love. Despite these challenges, I managed to find in short order the leader and ex-leader of all the local *jembe* troupes, Dembele Tidiane.¹⁹ Originally from Burkina Faso, he was also an excellent *bala* player, who played a very exciting style. He helped me find office space in a popular and well-placed *quartier*, with lots of traditional culture, as opposed to the usual, quiet NGO and expatriate neighbourhoods. The office, also an up-country way station for passing volunteers, became something of an African music and culture nexus—occasionally even to other passing tourists and ex-patriots—helping to fulfil some of our mandate to encourage cross-cultural exchange. In addition to my work duties, I played for many marriages and naming ceremonies as part of Tidiane's group. In the evenings, he would teach me *bala* and eventually, we started giving performances.

Drama and Pilgrimage

The Korhogo experience was rich with wonderful, cross-cultural encounters: Work and performance trips in the neighbouring countryside and eventually, the drama of aborted presidential elections due to mass action anti-government protests, a coup d'etat (during which I was absent), and falling asleep at night to the sound of automatic weapon fire, among much else. Near the end of my time, I took Tidiane on a pilgrimage to the Mandeng heartland of Mali and Guinea. There was much

¹⁸ On my return from Bamako, I spent time with a favourite musician of mine: Senoufo *bala* player, singer, and composer, Souleymane Traoré, also known as Neba Solo, in his village, near Sikasso, Mali. I committed to return there for training, until my plans changed, as described in the text. Traoré has since been invited to Harvard University by Quincy Jones Professor of African American music, Ingrid Monson, who is reportedly preparing her next book about him. (“Ingrid Monson, Quincy Jones Professor of African American Music, Harvard University”; *Kenedougou Visions: Music of Neba Solo by Ingrid Monson* || Radcliffe Institute 2013)

¹⁹ The younger, competing groups were composed of his former apprentices.

drama to enliven this experience as well; on my return to Bamako, we learned of the death of Fousseini Sissoko from his twin brother Alhassan, who would become my long-term teacher and lodger; in upper Guinea, we were threatened and extorted at check points and Tidiane was nearly shot by a drunken, armed policeman, distraught that his own village had been attacked with support from the Burkina government. I was told by a much feared *fetisheur* that all this had been foreseen and my destiny was there, without Tidiane. He had to sneak back into Mali overnight, up the Niger river on a small trading boat. I stayed in a *campement* (a settlement nearer to agricultural lands) outside of the town of Siguiri and played music until a local policeman threatened me with charges of spying and told me to report to his headquarters. He was most likely looking for a bribe, but I caught a taxi back to the border and back to the relative security of Bamako. This frontier—of rhythm, seers and near lawlessness, so far from my other true love—was too much to handle, and I bid a partial retreat.

A Home in Between

I had the time of my life in West Africa, even deciding to stay indefinitely on several occasions, but eventually, my romantic relationship sorted and strong, I decided to return to the USA, as my wife to be had already done. Perhaps not coincidentally, it was around this time that I envisioned a combination of Western—especially Jazz—harmony and African rhythm. I loved the music I had been playing and felt, as many American, European and Asian musicians do (judging by the popularity of serious African music study in these diverse locales), that there was something important in the African rhythmic perspective, something intrinsically powerful, stimulating, complex and of profound human beauty. Some of my fascination lies in the fact that the experts and principal exponents of the music are for the most part, illiterate and uneducated, in the Western/modern traditional sense²⁰. Nevertheless, I wanted to combine my experience and growing expertise with my own cultural perspective—harmony, notation, strongly rooted as they are in analysis and the transmission of explicit knowledge. This shift back toward my roots would eventually lead to the attempt at cross-cultural synthesis I have found in the perspective under scrutiny in this study, as well as in a Master's Degree in Jazz Composition. I would yet travel and live in California, Zimbabwe and South Africa, studying western and traditional music of various sorts along the way, but the seeds of the

²⁰ Although many of the younger apprentices had basic literacy in French, most of my older musician contacts did not know even the alphabet. According to UNICEF data on Mali, for example, for the period 2008-2012, the literacy rate for male youths (aged 15-24 years) was 56%. (“Statistics”) I left Mali in 2000. In my experience, a musical or other apprenticeship was often chosen in place of schooling. This practice was changing—slowly—in favour of more universal schooling, more girls in school, and so on, but I suspect the literacy rate of older musicians from rural areas (the origin of the music) is much less. Certainly, music literacy rates are much less still.

search now being conducted through the lens of the harmonic perspective of rhythm had been sown throughout this long journey.

Background: Efrain Toro

The following is a brief, chronological summary to help situate Efrain Toro. Highlights which point to the development of the musical worldview under scrutiny are included. Explanations of his perspective and theories are covered elsewhere in this study.

Efrain Toro emphasized on several occasions that he was from an academic family of mathematicians, engineers, lawyers and teachers. He, however, was drawn to music from a young age. Toro remembered the first time he played drums was as a child during Puerto Rican Christmas celebrations. There he accompanied the Spanish derived ternary forms known as *Villancicos* and *Alguinados*. “(I am from) Puerto Rico...We have an interesting tradition: Spanish, southern Spanish, northern African. And so, we have Africa from different places.”²¹ (Toro 2012b)

His father wanted him to play classical guitar, but as a left-hander, he had to play everything backwards and upside-down. He claimed his left-handedness has been a major contributing factor to his perspective on music, as he sees the world, “from the opposite side.” He later acquired a drum set and claims he was playing in a band a week later, himself with two guitarists. He says he never thought much about technique until he got into “percussion,” that is, Afro-Caribbean folkloric instruments like congas, bongos and timbales. He acquired these and became interested in hand drum technique. He became a good bongo player; he enjoyed it as the bongo player's role is to solo much of the time. He recorded a bongo solo at age 15 and reflected that when he heard it again at age 40, it still sounded very good. He said that in his later years he still uses some of the same melodic ideas but now with more perspective, a central topic of this work.

In discussing the aforementioned bongo solo, I suggested that the child learns intuitively in ways that the intellect cannot match. Toro responded with one of the central refrains of our time together, that he sees no conflict between the intellect and the 'natural.' As a young man of 21, Toro went from Puerto Rico to the New England Conservatory. There, new to orchestral playing, he said he discovered rudiments and combinations that he was not accustomed to during his early musical education in Puerto Rico.

I would practice classical music all day and at night I would practice congas, once in a while. When I would get to congas, I couldn't play congas because all I wanted to play was paradiddles and stuff...and I sounded horrible! Now, I know more paradiddles than most people, but they sound musical. At that time, I didn't know what to do. I couldn't hear the music in them. So, I've been a victim of technique, of not being able to play music because of technique, so I know the problem. But the problem is not insurmountable. With a little point of view and the right direction you can see music in technique. (Toro 2012a)

²¹ Including, of course, sub-Saharan Africans brought as slaves.

Toro also talked about his early days in New England, where his percussion instructor would not let him touch his instrument for several months, until he developed the proper motion in his strokes. Though he did not mention this experience often, it was of probable significance in his later realizations about motion. He mentioned the conductor, violinist and Yoga enthusiast Yehudi Menuhin, and how Menuhin relates violin technique to a wave, as Toro does for drum technique. Toro went on to say that this realization has happened many times, in many different cultures, and has been given many names.

While in New England, Toro also studied drum set with acclaimed player and pedagogue Alan Dawson. He did not go into great detail about his experiences with Dawson but repeatedly described him as a genius; Toro was most impressed by the way Dawson could make one idea such as a drum rudiment into three or four different things. He could reportedly use the same motion but change the space and timing between the articulations to produce these variations. Toro also mentioned that Dawson played a beautiful waltz with *two* and *three* concurrent metres and that the 'greatest idea' from his teaching was the necessity of singing melodies while playing.

So, the melody guides you to play, no matter what instrument. Whether it's the bass or drums. You think, 'Oh, we're just keeping the beat.' No. If you're keeping the beat without knowing the melody you're not doing anything. But today...you can program a drum machine, you can program yourself to play, no melody. And we play more and more that way. It's a shame, because the idea is the melody. (Toro 2012k)

Again, Toro did not go into any detail about the technical content of his time with Dawson but the aforementioned ideas show both men's affinity for a multi-dimensional approach to music. Still, Toro knew he had not found what he wanted, in his native Puerto Rico or in his conservatory and jazz education. He sensed there were still undiscovered possibilities in his conception of music and rhythm.

...I knew that I needed to get out of Puerto Rico. I needed to go to Boston. And immediately when I got there, I got what I was looking for. And so, I could play, and keep myself going like that, but I would be very limited. And even then, after going to the conservatory, I knew what I had to work (on). I sat down and worked those downbeats and upbeats, and I realized and I went, 'Sheezus. I can't do these things.' And so, what is the relevance of that to playing? I was playing already. But I couldn't (play the perspective exercises he was then conceiving). (Toro 2012n)

Toro moved to Los Angeles in 1979 to become a studio musician. There he played on many film and television scores, and commercial jingles. He also performed and recorded with artists including Stan Getz, George Benson, Los Lobos, Chicago, Kiss, Placido Domingo, John Klemmer and

others. During this time, he taught at the Musicians Institute's percussion school (PIT) for 16 years and worked as a clinician, product specialist and designer for Roland Corporation.

Toro also participated in eight Percussive Arts Society International Conferences (PASIC). It was at one of these conferences that he mentioned an important interaction with fellow percussionist, Glen Velez, as well as an influential performance by Indian percussionist, Trichy Sankaran.

...I met Glen Velez and Evelyn Glennie...there were a lot of people there...and I saw Trichy Sankaran playing. Trichy...he blew the whole thing open...that's quite a long time ago and Glen Velez. And Glen was very impressive, but Trichy was out of this planet. He did a solo on *Kanjira* and... there's no drummer that can do that. There's no drum set player that can do that...and he just starts playing this stuff...and you look at people in the hall, in the place, and everybody was just stunned, you know? From what planet is this guy come from? It's that kind of feeling. So that convention had a little bit of that vibe. John Bergamo was there and a bunch of other people I knew. And so, I hung out with Glen Velez for a little while...And we're sitting on the floor and we're playing...they were playing seven...I'd never played odd metres, anything like that and I sit down to play, and I'm lost, I'm just trying to catch up, but then...I'm with Emil Richards, and then when (we) stop, Emil says, 'Tell us some about your throat singing.' And he talks about it and then he starts doing it and people were freaked...JD: Who was doing it? ET: Glen Velez. And people freaked. And I remember, so I became aware of that. I had heard that he's doing it and... he's an easy kind of guy, he didn't make a mystery out of it or anything. And he says something interesting...He says that speech is overtones, very fast. JD: What does that mean? ET: Well, think about it. Eaaarrrr, eee aaa auun ohh, eaar... (overtone singing). Speech is that...And so, I thought of it for a long time, and it makes sense to me. It makes total sense...it's just an interesting realization, and to hear them (overtones), to hear the beauty of every note...it's an experience...Because again if you know music...If you've heard good classical music, good this and that...when you hear those melodies very clear, then you'll know...You'll go, 'Ahh! That's why those people play what they play!' Do you see? And it's a different realization. That's why those people in the country play that like that. Because...they play on that note. And on that note, those harmonics come out. JD: And you were saying earlier that you get so into hearing those harmonics that it's like being in a groove, that's all you want to hear²²...ET: It's a groove and you don't want to hear anything else...You know, immediately. And you know all the performers that are connected. You just know. There's a simple way of you knowing what's going on. And (when) I realized that I went, 'That's heavy.' That's a heavy realization to know who's connected and who's not. Really. It humbles you because it shows you where you're at. (Toro 2012l)

Though he was already a well-respected teacher and performer, it appears this conference experience had a catalytic effect on Toro's future direction, in several ways. He alleged that the hall full of top performers and educators was 'stunned' by Sankaran's Indian Classical conception of rhythm; Toro was also moved by his own realizations concerning the overtone series, its hypothetical role as

²² Toro has claimed in our unrecorded discussions that he can hear unique harmonic interactions for each note of the scale, bestowing something like absolute pitch, the ability to distinguish notes by their sonic quality alone.

the foundation of rhythmic practice, even its apparent foundational influence as a measure of aesthetic quality. This idea, as well as the relationship between speech and overtones, I have chosen to leave outside the focus of this paper; I include his observations here to help suggest the extent to which Toro is moved by these ideas, based on his own aural perceptions.

While still in Los Angeles, Toro worked on his downbeat/upbeat/dotted note perspective, as documented elsewhere in this paper. After some initial success, and a newfound ability to play in *five*, he tells the story of an epiphany, brought about by an interaction with a Greek student:

I went to my student, my Greek student and played (in *five*), and he said I was playing in *seven*. I said I never (before) played in *five*. *Seven* is out of my...and I played a pattern. He counted to the pattern in *seven*, and I saw the world. Everything opened up. It's a perspective...So, I was playing 1 2 3 4 5, and the student counted 1 2 3 4 5 6 7, to my *five*...So I went home and I put the metronome in *seven* and played in *five*, and did the opposite too. And my brain was fried. My brain was so fried. But, I stayed with it for an hour, an hour and a half. Then after that I had to go to sleep... 'cause I couldn't...my brain was finished. I slept from the afternoon 'til the next day. It was so heavy. (Toro 2012a)

Toro's emphatic portrayal of this experience suggests that it created at once his new perspective on rhythm, the focus of his career and life, and perhaps even a cognitive reorganization, hence the intense need to sleep.

As a studio musician, Toro claimed he needed to have a wide perspective, capable of playing in many different styles. He moved to Spain in 1996 where he established himself as a percussionist and worked with top artists in Pop, Jazz, and Flamenco genres. On several occasions he expressed his frustrations with the music industry, a partial inspiration for his shift toward an educational focus; in the early 2000s, he spent several years teaching in Cape Town and then took several more years for reflection in Puerto Rico. Toro now focuses less time on playing music and more time on teaching about his perspective and his vision for an evolution in rhythmic comprehension. In recent years, he has spent his time playing, teaching and lecturing about rhythm in South Africa, Israel, Puerto Rico, Peru, Italy, Austria and elsewhere.

Indian Rhythm, The Larger, Older Stage

As many sources tell, the subject of Indian music is vast and ancient. The old epics tell of music's divine origins as a gift from Lord Brahma, the Creator, to Lord Shiva, who passed it in turn to Saraswati, Narada or Bharata, depending on the story and version told. (Joshi 1977, 6) Apart from legend, references to music theory document this long history. From the Vedic age (2000 to 1000 B.C.), there is early mention of note names and instruments, including the *Veena*, *Vanshi* and *Damaru* (stringed instrument, flute, and drum). The Buddhist and Jain scriptures reference the early classical form known as *Jati* music and the *Veena*. The epics Mahabharata and Ramayana (500 B.C. to A.D. 200) reference the seven notes and various instruments. Bharata's famous music treatise the *Natya Shastra* (A.D. 400 to 500) first names the seven notes of the octave. (Joshi 1977, 6–7; Leake 1986, 4; "Portal: Indian Classical Music" 2013) Historical references to musical developments and treatises continue into modern times. In addition, there are the numerous folk genres which exist alongside, and have served as inspiration for the classical traditions. (Deva 1995; Joshi 1977; Wade 1987; Strangways 1989; J. Kippen 2006; Jairazbhoy 1988) Finally, the situation is complicated still further by the existence of not one but two classical traditions: The Carnatic tradition of Southern India and the Hindustani tradition of the North, itself a result of the extended cultural fusion that took place with the successive Muslim invasions starting in about 1100 A.D.

Necessary Limitations

This short overview will attempt to limit this immense subject and the inherent complexity therein by discussing primarily rhythmic theory in classical Indian Music. That rhythmic theory is the primary interest in this work is clear; the choice of classical music is based on several considerations: 1. The classical genres are well documented, and more accessible outside of India, through instruction and recordings; 2. The classical genres are arguably more complex and complete in their conception of rhythm; 3. My local teacher, Karthiagasen Pillay, is a proponent and performer of Indian Classical Music.

South and North

The choice of which classical tradition to focus on is more problematic. I chose to document my process of learning to understand Indian rhythm through the process of learning the *tablas*, because *tablas* were readily available, and because they were an iconic symbol of Indian rhythm inside and outside of India; they are relatively popular around the world and have proved adaptable to various genres of music. Also significant, I liked the sound and wanted to learn the instrument.

The *tablas*, however, are primarily a North Indian, Hindustani instrument, and my local *guru* is primarily a South Indian, Carnatic performer. The difference, though at times problematic for me, seems to be less so for Mr. Pillay. Most of the percussionists in his classes in fact play *tabla*; in the classes I have attended, approximately twelve students played the *tabla*, and only one or two the *mrdungam*, the standard drum in South Indian Classical music. Pillay, of course, plays both, and makes periodic reference to the similarities and differences, which he seems to understand intimately. The two streams are at some point in the distant past of the same origin and therefore share much in common. I will of necessity, then, attempt to present an overview of both Carnatic and Hindustani concepts of rhythm and drumming, aided by written sources that cover one, the other, or, as here, both. This dual approach is implied by the course of my *tabla* learning experience, and by the historical and contemporary nature of Indian Classical rhythm. There are also important pedagogical and stylistic concepts—in particular, polymetric exercises and an elastic treatment of time—that align with harmonic perspective of rhythm, the approach under scrutiny in this study.

Common Origins

There are two principal schools of Indian classical music: the Hindustani or Northern school, and the Carnatic or Southern school. The fundamentals are the same in both the systems. But they differ in development and treatment. (Joshi 1977, 19)

The commonalities can be easily seen in terminology. Many of the musical terms are the same or nearly the same, likely pre-dating the early Islamic Sultanates and Mughal Empire that spawned the hybrid Hindu/Muslim cultural forms of the North. The notes of the scale, Sa Ri Ga Ma Pa Dha Ni, for example, are the same in both systems. However, the conventions of alteration of the principal notes differ.²³ Likewise, the general name of a note is *svara*, the melodic system of a given composition or performance is *raga*, and the metric scheme is known as *tala*, in both Carnatic and Hindustani terminology.²⁴

'Metre' in Context

Just as the term 'scale' is insufficient to describe the notes and the various melodic conventions of movement that are implied by *raga*, so the term 'metre' goes only so far in helping the uninitiated listener to grasp the concept of *tala*. *Tala* is perhaps better translated as 'rhythmic cycle'²⁵; it is in

²³ The melodic systems are notably complex in both strains of Indian classical music; Wade gives a useful overview and comparison for musicians trained in the Western perspective. (Wade 1987)

²⁴ These terms vary depending on sources, system of transliteration, and musical strain; *Rag* and *tal* are often seen in discussions of Hindustani music, but the similarity is still clear.

²⁵ Deva uses this description as a chapter title. (Deva 1995)

the details of what constitutes this cycle however, that some complexity arises. There is considerable debate on the definition of metre, of the applicability of western concepts of metre to other musics of the world, of the psychological processes involved in perceiving and/or generating a concept of metre, and so on. The reader interested in detailed discussions of this sort is referred to the work of London, Clayton, Arom, Agawu, and Lerdahl and Jackendoff. (London 2004; Clayton 2008; Arom 1991; Agawu 1995; Lerdahl, Jackendoff, and Jackendoff 1996). For clarity, I will use as a foundation Clayton's statement that, "Much music (but not all) is organized with respect to a periodic and hierarchical temporal framework, in such a way that a cognitive representation of this framework may be generated in the mind of the listener. This organization and its representation are termed 'metre'" (Clayton 2008, 41). When discussing Indian classical music, at least some of the confusion relating to questions of how metre is perceived and whether different metres are perceived in similar fashion by different people is avoided because the structure is inherent in the conception of the music. According to Clayton, all metrically organized North Indian *rāg* (and presumably all metrically organized Indian classical music) is, "set to one of a number of *authorized metric frameworks* called *tāls*." (Clayton 2008, 43, emphasis my own) This part of the discussion will focus on the constitution of these authorized metric frameworks, rather than digressing into the theoretical and psychological analyses referred to above.

Tal/Tala

Just as in the Hindu religion, man is born, lives his life, dies and is then reincarnated to begin a new life, so the *tala* cycle begins, develops and then returns to the *sam*, the first beat of the cycle, anchor of all melody and rhythm and the leading beat to which all returns. (Montfort 1985, 63)

Tala is a recurring cycle of some fixed number of beats. The cycle is more than that however. Inherent in each of the *tala* cycles is a structure made up of subsections that occur and recur in a fixed order. The *tala*, overall, is something of a map indicating the way in which time unfolds under its influence, rather than a simple number to be counted. Deva offers this example: "Karnatak (Carnatic) music has *Jhampa tala* and *Matya tala*, both having ten *aksara-s* (beats or counts); but the former has a sectional arrangement as 7+1+2 and the latter 4+2+4. The internal pattern thus becomes very important musically and aesthetically." I will begin to explain the Carnatic conception first since, as Montfort states, "The music of South India retained a purity of development that has led to a highly organized theoretical system." (Montfort 1985, 63)

Carnatic Tala

The basic components of *tala* in Carnatic music are the three *angams*: *anudrutam*, *drutam* and *laghu* (Montfort 1985; Deva 1995; Pillay 1997; spellings differ slightly in different sources)²⁶ With these basic time units are composed the 35 principal *talas* in contemporary usage. Montfort and Deva make reference to 108 classical or ancient *talas*, but descriptions are mostly held to the “later, more mathematically organized system of 35 *talas*.” (Montfort 1985, 63) According to Deva, the 35 *talas* in contemporary usage were classified by Purandaradasa in the 16th Century. Besides the 108 ancient *talas* and the 35 principal *talas*, still others exist, such as the *Chapu talas*. (Deva 1995, 40) However, this discussion will focus on the 35 principal *talas* and their organization based on the *angams* mentioned above.

The Three Angams: Components of a Tala

Each of the *angams* is expressed by performers and audience alike with a gesture of the hands, or of one hand against the thigh. The *anudrutam*, commonly represented by the symbol ‘U’, is always one beat long, and is marked with a clap of the hands. The *drutam*, then, is always two beats and is marked with a clap and wave. It is represented by the symbol ‘O’. The *laghu*, however, can be three, four, five, seven or nine beats long; it is marked by a clap and the appropriate number of finger counts, and is represented by the symbol ‘I’. There are seven principal *talas*—which are in effect formulaic combinations of the three *angams*—each with the possibility of five different length *laghus*, thus rendering the 35 *tala* scheme. The number of beats in a *laghu* is known as *jati*. As an example, the first of the seven principal *talas* is called *Dhruva*. Each of the possible *Druva* varieties has the form: *laghu*, *drutam*, *laghu*, *laghu*, or **I O I I**. *Tisra jati* indicates that the *laghu* has three beats. Therefore, *Druva tala*, *tisra jati* would be represented as **I₃ O I₃ I₃**; Its beat structure is 3 + 2 + 3 + 3, or 11 beats. Each of the 35 *talas* also has its own short name, which in the aforementioned example is *Mani tala*. The common, eight beat, *Adi tala*, which is the primary *tala* Pillay uses with beginner students, is a variety of the fifth principal *tala*, called *Tripata*, which has the structure **I O O**. It is *Tripata tala*, *chaturasra jati*, meaning its *laghu* has four beats. The resulting count is thus 4 + 2 + 2, rendered, **clap**, 2, 3, 4, **clap**, wave, **clap** wave. As indicated in bold, each *angam* begins with a clap, thus the claps mark the sections of the *tala*. As we will see this is not necessarily the case in the North Indian system.

²⁶ Pillay mentions six *Angam*-s: *Guru*, *Anudrudam*, *Drudam*, *Lagu*, *Plutham*, and *Kaka Paada*; However, he only elaborates on the three mentioned above, citing them as the most commonly used. (Pillay 1997) Presumably the other three are used in the ancient system of 108 *talas*.

It is not my intention to teach the entire system to the reader; ancient treatises and even modern books on Indian music tend to bewilder the mind of the uninitiated and/or foreign reader with great lists of terms and names reaching back to antiquity. As all the equivalent terms do not exist in English, however, and to give some semblance of the actual system as it is used, I have used the more important Indian terms here. As an aid, they are listed in the table that follows.

Even without listing the names of the rest of the 35 *talas*, the interested reader can piece them together using the structures of the seven principal *talas* and applying each of the five *laghu* types **I₃**, **I₄**, **I₅**, **I₇**, and **I₉**. The seven principal *tala* structures are listed below:

Principal Tala	<i>Angam structure</i>	Symbols	Numerical formula (I has 'n' counts)	Counting gestures
Dhruva	Laghu, drutam, laghu, laghu	I O I I	$n + 2 + n + n$	Clap (finger counts), clap (wave), clap (finger counts), clap (finger counts)
Matya	Laghu, drutam, laghu	I O I	$n + 2 + n$	Clap (finger counts), clap (wave), clap (finger counts)
Rupaka	Drutam, laghu	O I	$2 + n$	Clap (wave), clap (finger counts)
Jhampa	Laghu, anudrutam, drutam	I U O	$n + 1 + 2$	Clap (finger counts), clap , clap (wave)
Triputa	Laghu, drutam, drutam	I O O	$n + 2 + 2$	Clap (finger counts), clap (wave), clap (wave)
Ata	Laghu, laghu, drutam, drutam	I I O O	$n + n + 2 + 2$	Clap (finger counts), clap (finger counts), clap (wave), clap (wave)
Eka	laghu	I	n	Clap (finger counts)

Table 1. Carnatic Tala Formulae. The *angam* structure is indicated in the counting gestures with bold type.

I have seen no reference that explains *why* these formulae are as they are. It would seem one simply has to accept the system and learn from it. That more variations could be added is clear, but just as clear is the immensity of the task of memorizing and mastering these 35 *talas*. Among them, there is only one with three beats and one with four; two have six beats, three have eight beats, and one has sixteen. These more common metric schemes aside then, the bulk of the 35 are unusual (to most outsiders), long, odd, or all three. Four *talas* have 20 or more beats and the longest—*Dhruva tala*, *Sankirna Jati*, or **I₉ O I₉ I₉**—has 29!

Subdivisions: *Gati*

Within the beat, the subdivisions used are also three, four, five, seven and nine. A composition or performance will tend to explore one of these beat subdivision schemes for an entire section before moving to another. The name of the particular subdivision being used is *gati* (as opposed to *jati*, the number of beats in a *laghu*) (Montfort 1985; Pillay 2011), and the numbering is the same as those used above: *tisra* for three, *chaturasra* for four, *khanda* for five, *misra* for seven and *sankirna* for 9.

Mnemonic Syllable Systems: *Bols* and 'Jati Rhythm Scales'

Indian musicians make extensive use of syllables for the transmission of musical ideas. Besides the solfège-like system mentioned above (*sa, re, ga, ma, pa, dha, ni, sa*), there are names for the various sounds produced on the drums. These sounds, or *bols*, are used to teach and memorize extended compositions, with or without reference to written sources. Unfortunately for the novice, there is considerable variation between the *bols* used in Hindustani and Carnatic drumming; even within one system, one sound can have several different names that change depending on the context, ease of pronunciation, teacher preference and so on. In South India there is also a common system used to count *tala* divisions, referred to by Leake as, '*Jati* rhythm scales.' (Leake 2010; Montfort 1985)²⁷ As some or all of the syllables are also used for *tabla* and/or other musical memorization/notation systems, the potential for more confusion exists. However, the *jati* system seems to be standardized as a way to count rhythmic divisions, irrespective of sound source, and as such is quite useful as a theoretical and pedagogical device. (Leake 2010; Montfort 1985) The *jati* numbers apply once again, but in this case there are fixed syllables used for each grouping (Table 51).

²⁷ Also see Konakol ("Konnakol" 2014)

Syllables	Grouping Name	Numerical Structure
<i>Ta ki ta</i>	<i>Tisra</i>	3
<i>Ta ka di mi</i>	<i>Chaturasra</i>	4
<i>Ta ka ta ki ta</i>	<i>Khanda</i>	5
<i>Ta ki ta ta ka di mi</i>	<i>Misra</i>	3 + 4 = 7
<i>Ta ka di mi ta ka ta ki ta</i>	<i>Sankirna</i>	4 + 5 + 9

Table 2. *Jati/Konakol* Counting Syllables.

Exercises

Monfort and Leake recommend exercises using these syllables to superimpose the different groupings on the various subdivisions, or *gati*, (see above), and to do so in different *talas*. As an example, Montfort starts his ‘Exercise III’ with *Adi tala*, which has eight counts or beats, subdivided into three, or *tisra gati*. One is then instructed to keep *tala* (**clap**, 2, 3, 4, **clap**, wave, **clap**, wave) while reciting the *jati* syllables above in the five different groupings, all while maintaining the *tisra gati* subdivision. *Tisra jati* corresponds with *tisra gati*, so each ‘*ta ki ta*’ aligns with each beat. *Chaturasra jati*, however, creates six groups of four within the 24 (eight beats times three subdivisions per beat) subdivision cycle. This creates a *three* against *four* polyrhythm, expressed in a linear fashion. To hear the interaction, it can help to think: **TA** ka di **MI** ta ka **DI** mi ta **KA** di mi, or, **1**, 2, 3, **4**, 1, 2, **3**, 4, 1, **2**, 3, 4, etc.; the bold, underscored syllables, represent the beats of the *tala*, as marked with the hand gestures. A next step would be to emphasize every ‘*ta*’, or ‘1’, to bring out the *three* cycle while the hands keep the *four*.



Audio Example 1. *Adi Tala, Tisra Gati, Grouped in Fours* (CD Track 1).

Four and *three* fit nicely into a cycle of 12 subdivisions; It takes two repetitions of this polyrhythmic cycle to fill one eight beat *adi tala* cycle. The challenges continue to mount as one moves to the other five, seven and nine *jati* groupings. These don’t resolve within one *tala* cycle so they have to be continued for several, or else started somewhere in the middle, so that they resolve on the all im-

portant *sam*, or beat one (Montfort presents the latter option). Having mastered those, the next challenge could be to do the same with a new primary subdivision, such as *chaturasra gati*, or four, and then of course to repeat all with other *talas*.



Audio Example 2. *Adi Tala, Tisra Gati, Grouped in Fives, Full and Truncated Cycles* (CD Track 2).

This provides an experience of simultaneous rhythmic structures, devised from a theoretical understanding. In my own lessons, I have not been instructed in this way (though casual reference to the concepts may have been made), nor have I seen this method in the literature I have examined on traditional Carnatic apprenticeship. Though I was not instructed to do this sort of practice by my teacher Mr. Pillay, I did choose to practice quite a few of the aforementioned permutations, coming from a theoretical, outsider perspective as I do. In fact, the methods of Montfort and Leake referred to above, as well as Toro's, are directed at the musician wanting to incorporate new conceptual perspectives from outside their own, presumably Western musical outlook and activities, be they playing, improvising, composing, or listening; they are not addressed at the process of learning a specific instrument or repertoire (although Leake has also written an excellent *tabla* textbook, referred to elsewhere in this discussion (Leake 1986)). A more usual method for introducing the student to the fundamental rhythmic complexities expressed in Indian music, and thus preparing him or her to improvise with an unerring sense of the *tala*, is the learning of compositions that exploit some these possibilities. This is of course the method *sine qua non* in oral tradition; it demands not just theoretical understanding, but the ability to demonstrate the conceptually demanding material, arranged in an aesthetically pleasing and traditionally acceptable manner, on the instrument(s) themselves. The degree to which the material must be understood conceptually is a matter of lengthy debate, which will be addressed in the section on 'natural' musicians (page 73), "Ways of Knowing" (page 79), and elsewhere throughout this thesis.

Aural Tradition: Exercises in Context

A solo based in *Adi Thala* was given to me by Pillay over a long series of intermittent lessons during the course of about one year (he continued to add to and modify it for instructional purposes until our lessons finished in 2015). It contains sections based on two and four subdivisions to the beat (*chaturasra gati*), as well as three (*tisra gati*), five (*khanda gati*), and seven (*misra gati*).

In the excerpt below (Figure 6.1), we find an interesting example of the extension of a phrase to three different lengths, bringing it out of alignment with the *tala*, then the repetition of another phrase to bring the phrase structure back in line with that of the *tala*. According to Pillay, this section is a *korway*, which is a combination of phrases, played either two times each or three times each. (Pillay 2011) The phrase that is manipulated in this *korway* is a partial statement of a recurrent theme found throughout the composition, *num dhin kita thake natha chatha kita thake*.²⁸



Audio Example 3. *Adi Thalam Solo Motif* (CD Track 3).

This phrase is used as something of a cadence to demarcate sections or sub-sections of the piece. It is referred to repeatedly in the section immediately prior to the excerpt, in increasing frequency, finishing the section with four uninterrupted repetitions. After the relative tension built by the four repetitions of this relatively dense phrase, there is a partial release with the dropping of the last two beats of continuously expressed 1/16th notes. This release of tension is suspended, however, as new tension is built with the counter-metric phrasing to come.

The first iteration of the partial phrase, *num dhin kita thake tham*, covers three beats and is played twice (first part of bar 5); the next iteration then, *tha num dhin kita thake tham*, starts on beat seven. It covers three and a half beats and is also played twice (end of bar 5 to middle of bar 6); the second repetition is particularly unsettling (or exciting, depending on the temperament of the listener), as it starts on an off-beat and is played with that orientation, compared to the previous statement. The third iteration, *tha tha num dhin kita thake tham*, covers a more familiar four beats (end of bar 6 to first half of bar 7), but not in concert with the four beat halves of the *tala* cycle; Rather, it extends first from beat six to one, then from beat two to five. Finally, starting again on beat six comes the first of three repetitions of another phrase, *tham tha te natha chatha kita thake tham* (last half of bar 7

²⁸ These are Carnatic *bols*, as used by Pillay. Each syllable represents the articulation of a particular sound on the instrument. The same material could also be played on the *mrtingam*, the standard drum of a South Indian classical ensemble.

to beat one of bar 9). This *thiramanum*²⁹ is similar to the original, un-truncated phrase, but significantly different as well. Both are four beats long, and both contain the 1/16th note ‘run’, *natha chatha kita thake*. This concluding phrase however, begins and ends with the strong, two handed, open bass stroke *tham*, first as an 1/8th note and finally as a 1/4 note. This relatively long note is like a breath before the next repetition. The phrase starts first on beat six, as noted, then on beat two, and finally on beat six again to end on beat one, *sam*. This time, however the phrase is technically only three beats long as the last *tham* is not played but rather subsumed by the next section.

²⁹ According to Pillay, *thiramanum* is the Carnatic equivalent of the more commonly used North Indian term, *tihai*, defined by Leake as: “a rhythmic phrase repeated 3 times with the final stroke of the third phrase landing on an important beat of the cycle. A *tihai* is commonly used for concluding a melodic or rhythmic composition. *Ti* = 3, *Hai* represents the suffix meaning triple.” (Leake 1986, 13) Pillay gave a similar definition for *thiramanum/tihai*. (Pillay 2011)

Figure 1. Adi Thalam Korway.



Audio Example 4. *Adi Thalam Korway* (CD Track 4).

Tension and Release, in Time

This rather detailed description of the rhythmic placement of phrases in this short excerpt is meant to highlight the variable and often counter-rhythmic nature of the material, reinforcing, contradicting and again reinforcing the *tala*. It is of course the nature of primarily percussive musics to work with time in this way to create tension; As harmonic and melodic tension are not applicable, or at least less so, it is rhythmic and dynamic tension that are exploited. The various sounds can be thought to make melodies, especially in the case of Indian drumming, where the palette of sounds is quite rich and varied. The melodies don't create tension in a key-centered framework, however, but in the creation, juxtaposition, reduction, augmentation, deconstruction and recombination of phrases and their components. The result is a network of relationships between these phrases and bits of phrases, as well as between the phrases and the metric structure. In an accompanying role, of course, a dialogue would also exist with the soloist and other performers.

Elsewhere in the composition, similar examples of reduction, augmentation and recombination of thematic material can be found, as well as sections that use other subdivisions of the beat. This occurs as foundational material: There are sections of the composition in *thisra nadai* (Pillay's spelling), or three subdivisions to the beat, *kanda nadai*, or five subdivisions to the beat, and *misra nadai*, or seven subdivisions to the beat. The composition also contains phrases that use other subdivisions, counter to the foundational subdivision, such as a two beat phrase with a subdivision of nine in the *misra nadai* section.

Composition in an Improvisational Context

Indian classical music is largely improvisational, so compositions are used to teach the student some of the culturally endorsed possibilities for variation within a particular *tala* (the preceding discussion presents a sample indicating the wide range of these possibilities). The compositions can also be played on their own as part of a recital or used whole or in part in an improvisational context. Both North and South Indian traditions include lore on the vast stores of compositions held in memory by great players.³⁰ Another approach is the teaching of variations on a structural form.

³⁰ See Kippen for a discussion on exaggerated boasts of compositional knowledge, plus memorization past and present (Kippen 1988, 122–23); See for a discussion of compositions and the *gharana* system (Leake 1986, 14); Wade and

Though Pillay also teaches short repetitive phrases or ‘grooves’ used to accompany various musical forms such as the *bhajan* devotional song, it is in Hindustani music that this approach takes precedence as a conceptual framework.

A Cultural Hybrid

According to Montfort, Hindustani music, in contrast to Carnatic music, “has achieved its equally high artistic standards through the cultural interaction between Hindus and Muslims, producing an extremely rich but less-systemized music. This process brought into being an estimated 350 *talas*, of which ten are most commonly used.” (Montfort 1985, 89) According to Clayton, about 20 *talas* are commonly used in North India today, but even some of those rarely so. (Clayton 2008, 57) As with Carnatic music then, the Hindustani rhythmic concept is theoretically *vast*, practically less so, but still highly challenging to perform or comprehend.

The Hindustani Approach

It is in the Hindustani concept of *theka* that we find its divergent orientation. Although the audience may keep *tal*³¹ in Hindustani musical forms, it is largely the *tabla* player who maintains the *tal* by playing its characteristic *theka*.³² The *theka* is a sequence of drum sounds, or *bols*. The *bols* are recited verbally and/or played on the *tablas*, and serve as memory and notation aids, as in Carnatic music. As the concept is the same but the names are different, so Hindustani music also uses hand gestures to keep *tal*, but they are executed differently, and identified by different symbols.

The Hindustani Rhythmic System

The *tal* cycle in Hindustani music is divided into groups of the primary, counted beat. These groups are called *vibhags*. Some of these *vibhags* are marked with a hand clap and some with a wave.³³ The beginning and end of the cycle (the ‘one’) is known as *sam*, as it is in the south. It is marked by a clap in all but *Rupak tal*. The *sam* and other clapped *vibhags* are known as *tali*,³⁴ and *vibhags* marked by a wave are known as *khali*. *Sam* is notated with a ‘+,’ (or in some sources an ‘X’) other

Kippen discuss various compositional formulae used in Hindustani drumming. (Wade 1987, 151–57; Kippen 1988, 126–27, 160–202)

³¹ In this section, I will use common Hindustani expressions and spellings such as ‘keeping *tal*,’ instead of ‘keeping *tala*.’

³² According to Pillay, in Hindustani music, the *tabla* keeps the *tal*, while in Carnatic music the *tabla* (or *mrtingam*) player plays with the *tala* kept on the performers’ (and audience members’) laps. (Pillay 2011)

³³ *Tal* is also kept by counting finger joints, starting from the base of the pinkie. Using both hands, one can indicate the beats (*matras*) with finger counting as well as the *vibhag* with claps (on the thigh) and waves. See Leake for suggested exercises. (Leake 1986, 59–60)

³⁴ Leake uses the term *bharee*, which indicates an open stroke on the low *bayan* drum, played by the right handed *tabla* player’s left hand. (Leake 1986)

tali vibhags with consecutive numbers starting from two, and *khali vibhags* are notated with a ‘O.’ Almost all common *thekas* are *khali* (wave) at their midpoint.³⁵ According to Clayton, “The primary requirement of a clap pattern is that the identity of *sam* should be clearly and unambiguously established, and therefore the pattern should not repeat within the cycle.” (Clayton 2008, 62) Therefore, a *tal* with an even number of vibhags, for example, must have at least one *khali* to disambiguate the progression from *sam* to *sam*. The aforementioned information is summarized in the table and example *thekas* below.

<i>Vibhag type</i>	Gesture	notation
<i>Sam</i>	Clap (wave for <i>Rupak</i>)	+ (in place of ‘1’)
<i>Tali</i>	Clap	2, 3, etc.
<i>Khali</i>	Wave	O

Table 3. Basic Elements of Hindustani *tal*.

<u>KEHARWA TAL: 8 MATRAS, 4 + 4</u>			
+ (SAM)	O (KHALI)		
:DHA GE NA TI NA KA DHI NA :			
<u>TINTAL: 16 MATRAS, 4 + 4 + 4 + 4</u>			
+(SAM)	2 (TALI)	O(KHALI)	3(TALI)
:DHA DHIN DHIN DHA DHA DHIN DHIN DHA DHA TIN TIN TA TA DHIN DHIN DHA :			
<u>RUPAK TAL: 7 MATRAS, 3 + 2 + 2</u>			
+/O(KHALI)	2 (TALI)	3(TALI)	
:TIN TIN NA DHIN NA DHIN NA :			

Example 1. Three common Hindustani *thekas*.

Martin Clayton points out that in some cases the relationship between the *tal* structure and the *theka* is quite clear, for example when the *khali* coincides with the absence of open strokes on the low *bayan* drum, whereas in other cases, it is less so. (Clayton 2008, 60) Clayton also proposes a hybrid

³⁵ The exception is seven *matra Rupak tala*, which has both *sam* and *khali* on the same beat.

model of *tal* analysis that integrates the idea of *theka* with an older Indian music whose rhythmic foundation is more akin to that found in the South.

A Hybrid Model of Rhythm

In Hindustani music, there is a drum correlate to the Carnatic *mrtingam* called the *pakawaj*. Both drums are double headed and barrel-shaped, with one head (the right for right-handed players) that is smaller, corresponding to the right drum of the *tabla* set. The *pakhavaj*, like the *mrtingam*, is also much older than the *tabla*. Legend has it that the first *tabla* set was created by splitting the *pakawaj* in half, though this seems unlikely³⁶. (Joshi 1977; Wade 1987) Stewart, Clayton and others agree that the *tabla* most likely developed in the last few hundred years only, with the modern form perhaps less than one hundred years old. (Clayton 2008, 52–53) What is clear is that modern Hindustani music exhibits a direct connection to the more ancient Hindu music, especially in the repertoire of the *pakhavaj*. Sachs states that Indian music and metre stem from the nature of the Sanskrit language: “India relies on the metrical aspect of rhythm more than any other country has done, not even excluding Greece. There are two obvious reasons for such predominance. One is the purely metrical character of the Sanskrit language down to the beginning of our era: long and short syllables were carefully kept apart without any accent in a western sense. The other reason is that verses—metrical verses—were used as the idiom, not only of poetry, but also of philosophical, historical, and grammatical treatises.” (Sachs 1988, 99–100).

Syllabic, Melismatic and Hybrid Interpretations

Clayton seems to agree with this linguistic orientation for older Indian music at least, and uses the term, ‘syllabic’ to describe music which is, “conceived as comprising distinct units, which have temporally definable attack points as well as other qualities of tone, timbre, dynamics, and so on. These units are called *bols*, because they constitute or can be represented by spoken syllables.” (Clayton 2008, 49) He goes on to juxtapose this model with his ‘melismatic’ model, which he claims developed largely in the 20th century in the *khyal* genre of singing. *Khyal* singing is performed at a markedly slow tempo, which allows the very expressive, melismatic style to flourish. *Khyal* performers continued to use the *tala* system, however, but in combination with a portamento

³⁶ Deva and Wade cite the story of Sudhar Khan who dashed his *pakhavaj* to the floor after losing a drumming competition. It split and the two halves became the *tabla*. This would have been in the time of Emperor Akbar (1556-1605). (Deva 1995; Wade 1987) Joshi and others state that the *pakhavaj* was cut. (Joshi 1977) Another popular legend has it that the *tabla* was introduced from farther west by Amir Khusrau in the thirteenth century. (Wade 1987, 135–36)

style of melodic development. “Melismatic rhythm could be described as *rag-* or melody-oriented—the simplest building blocks of the music are the melodic patterns specific to each *rag*. Therefore each note need not be articulated with a new *bol*; a singer may stretch one text syllable melodically to a considerably lengthy and complex melodic pattern, an effect imitated by the *mind* (portamento) produced on the *sitar* and other instruments.” (Clayton 2008, 51–52)

From these two models, Clayton proposes a third, hybrid model that he uses to explain the state of modern Hindustani rhythmic practice. He claims that *theke* is a result of this hybrid orientation; A syllabic model, as still used in South Indian classical music, does not rely on accentuation but rather on the historical clap pattern and a surface rhythm, “derived from a stream of distinct pulses.” (Clayton 2008, 49) The accentual model, as presented in the concept and practice of *theke*, however, is composed of weighted and non-weighted *matras* (beats), thus outlining an accentual hierarchy of beats between which, presumably, a more elastic approach to rhythmic improvisation is catered for.

Elasticity

I would add that it is perhaps the poly-metric nature of Indian music that has helped to engender this elastic rhythmic sensibility. Although Carnatic music is extremely diverse and complex in its modes of rhythmic expression, it is also quite strict in its presentation of and adherence to a strict stream of pulses. The combination of an accentual matrix and poly-metric sensibility would seem to be an ideal ground in which to cultivate an accurate but elastic time sense, capable of drawing on several metric schemes in the space of one phrase. This idea will be discussed more in chapter 0, page 198.

Lay/Laykari

Hindustani rhythmic specialists also extend the possibilities of any one metric structure through the introduction of alternative beat subdivisions and groupings therein, and by playing a composition or *theke* in different relationships to the beat structure of the *tala*. The concept of *lay* or *laya* is used variably and thus translates as ‘rhythm,’ ‘speed,’ and ‘rhythmic density,’ among other possibilities. Whereas in South India the tempo is theoretically fixed, with different speeds achieved through manipulation of the relationship between *matras* (beats), *jati* (subdivisions) and the *tala*, in North Indian music the primary *matra* tempo used to count *tal* is variable as well. There are three principal degrees of *laya*: *vilambit*, or slow, *madhya*, or medium tempo, and *drut*, or fast, with additional gradations possible (e.g., *ati vilambit*, or very slow, etc.); these are essentially the same names and concepts used in South India; the principal difference in the Northern approach is the variable speed of the reference *matra* tempo.

As mentioned, *laya* in North India can also refer to the relationship between the *tal* count and the articulation of *bols*—the subdivisions of, or multiples of the beat. Clayton confirms the broad semantic range of the terms *lay* and *laykari*, and prefers the latter when referring to the variation of rhythmic relationships. In reference to *laykari*, he states:

It means primarily either (a) the variation (usually increase) of *lay* ratio, or (b) the distortion of, or deviation from a steady beat (i.e. syncopation or rubato)...By extension of these senses, *laykari* describes (c) any technique dependent on or derived from the division of the *tal* and variation of the speed level (i.e. cross-rhythmic accenting, permutation of rhythmic groups, and so on); and hence (d) rhythmic variation in general (this sense is analogous to the more general sense of *lay* itself). (Clayton 2008, 153)

Thus the terminology, as the practice, is layered with meanings and references to various concepts. In this summary account of the basic principals of Indian rhythm I do not suppose to present an all-encompassing view, conceptually or semantically, but rather to give a detailed, comprehensible overview that can serve as a basic model for the elucidation of the central hypothesis of this discussion. I will continue to use the term *lay* to refer to tempo and *laykari* for rhythmic manipulation.³⁷

Lay Ratios, and Regrouping

The manipulation of the ratio of articulations to *tal* beat structure indicates that the beat is doubled, tripled, quadrupled, etc. Given a ¼ note rendering of the basic beat, this indicates 1/8 notes, 1/8 note triplets, 1/16th notes, etc. Also indicated, however, are fractional ratios (ratios where one number is not a multiple of the other). These can be written and conceived of in different ways. Clayton lists the first five ratios as 1:2, 3:4, 1:1, 5:4 and 3:2. Montfort prefers a to write them as fractions (he also lists more possibilities) and gives ¼, ½, ¾, 1 and 1 ¼. Both are summarized below:

Clayton's "lay ratio"		1:2	3:4	1:1	5:4	3:2	7:4	2		5:2		3:1		7:2		4:1	5:1	6:1	7:1	8:1	9:1
Montfort's "speed relative to the <i>tala</i> "	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	5	6	7	8	9

Table 4 Hindustani *tala* division ratios, with 'fractional *layas*' shown in bold. (Clayton 2008, 156; Montfort 1985, 95)

³⁷ Wade also refers briefly to the term parenthetically, i.e., "To sing *tarana* requires skill in rhythmic manipulation (*layakari*) and the ability to sing syllables rapidly." (Wade 1987, 177) This is perhaps a clearer explanation than the more comprehensive one quoted above.

All the non-fractional ratios from 1:1 up (1:1, 2:1...5:1, 7:1, etc.) correspond to the notion of *gati* as discussed in the section on Carnatic music. In other words, 5:1 means there are five subdivisions to the beat. 3:4 however, indicates there are now three articulations in the space of four counts of the *tal*. We are now in the realm of harmonic time, with two beat streams—one the count of the *tala*, and the other the *bols* as articulated by the musician—that are not related by multiples of whole numbers. That is, one is not expressible as a unit of the other. The relationship can be derived (made non-fractional) by multiplying the two together and applying the result as a new subdivision unit, e.g., twelve, that can simultaneously be expressed as three groups of four or four groups of three. This is the same process we saw in the Carnatic section when the *tala* was expressed as *tisra jati* (three subdivisions to the beat), but grouped in fours: *ta ka di mi*. This method quickly becomes clumsy and/or un-useable with more complex relationships such as 7:4.

The Indian Learning Process

As mentioned in the previous discussion on Carnatic rhythm, I was at one stage under the impression that most of the process of mastering the complex rhythmic relationships discussed above took place through the learning of compositions that utilize them. This has been true in my lessons thus far with Pillay, and this was suggested to me several times in discussion with Toro, who claimed that in the Indian apprenticeship memorization took precedence over analysis:

Those building blocks of, you know? Of pulse. That's what we play. And my two cents is that if you just know the downbeat and the upbeat and the dotted note (whistles)...and the Hindus know that. The Hindus know that because they're learning it in their compositions. It's part of the compositions. But you ask a Hindu person that, they won't know. (Toro 2012m)

Kippen, however, in his research on the *tabla* tradition in the city of Lucknow, presents a different picture.³⁸ Though he goes into detail on the importance of the memorization of a large repertoire of compositions, both in the *gharana* (see footnote below) and school systems, Kippen also mentions his *guru's* emphasis on 'creative thinking,' essential in composition and improvisation.

In order to compose or improvise in *tabla*-playing, it is obvious that a facility in rhythm is vital. Not only must a musician cope with complex cross-rhythms, but he must also know instinctively where he is within a metric cycle and, particularly, where he must begin and end his composition or improvisation. Consequently many exercises aimed at developing the pupil's sense of general rhythm (*lay*) and his knowledge of the structure of specific *tals* are given in the initial stages of the training. (Kippen 1988, 123)

³⁸ Lucknow is a city in the Northern province of Uttar Pradesh, and home to one of the six main *tabla gharanas* ('houses' or lineages). The others are Delhi, Benares, Punjab, Ajrada, and Farukhabad. (Kippen 1988; Leake 1986; Clayton 2008; Neuman 1985, 1977; Wade 1987; Deva 1995)

Example Exercises

Kippen goes on to give three example exercises, described and Transcribed Below.

Reciting the *Theka* at Different Speeds Relative to the *Tal*

In the first exercise, the student is required to keep a steady *tal* (16 beat *tintal*, in the example) with the appropriate claps ((**X**), (**2**), (**3**) in bold and parentheses), waves (**O**) and beat counts on the fingers (for *tintal* then: (**X**), 2, 3, 4, (**2**), 6, 7, 8, (**O**), 10, 11, 12, (**3**), 14, 15, 16). He or she then recites the *bols* of the *theka* for that *tal* (*na dhin dhin na, na dhin dhin na, na tin tin na, na dhin dhin na*)³⁹ in different speeds. The first speed is *barabar lay*, or one *bol* per beat. The speed is then increased to one and a half, two, three and four times the original, while maintaining the original speed with the hand gestures. One and a half speed indicates three bols for every two beats; the *bols* pattern happens three times in the time of two sixteen beat cycles. Visual representations are given below. Note the complete *tintal* cycles of the *bols* are differentiated in alternate shaded and non-shaded sections.

Clap, count, or wave gestures	Beat 1, 5, 9, 13	Beat 2, 6, 10, 14	Beat 3, 7, 11, 15	Beat 4, 8, 12, 16
X	Na	Dhin	Dhin	Na
2	Na	Dhin	Dhin	Na
O	Na	Tin	Tin	Na
3	Na	Dhin	Dhin	Na

Table 5. Exercise 1: *tintal* in *barabar lay*—equal speed or one *bol* per beat.

³⁹ This is the example given in the Kippen text from which this exercise is taken. Another common version is, *dha dhin dhin dha, dha dhin dhin dha, dha tin tin ta, ta dhin dhin dha*. *Dha* uses an open bass sound on the left hand *bayan* drum, as does *dhin*, so this version features almost continuous bass articulation. *Na* and *ta* are the same sound. Also common is to clap on all *thali/baree vibhags*; this differentiates them sonically from the *khali vibhag*, which is marked by a wave. (Leake 1986, 59) I find this system preferable, as heard in the audio example.

Clap, count, or wave gestures	Beat 1, 5, 9, 13	Beat 2, 6, 10, 14	Beat 3, 7, 11, 15	Beat 4, 8, 12, 16
X	Na Dhin	Dhin	Na Na	Dhin
2	Dhin Na	Na	Tin Tin	Na
O	Na Dhin	Dhin	Na Na	Dhin
3	Dhin Na	Na	Dhin Dhin	Na
X	Na Tin	Tin	Na Na	Dhin
2	Dhin Na	Na	Dhin Dhin	Na
O	Na Dhin	Dhin	Na Na	Tin
3	Tin Na	Na	Dhin Dhin	Na

Table 6. Exercise 1: *Tintal* in *de'orhi lay*—one and a half speed or three *bols* to every two beats.

Clap, count, or wave gestures	Beat 1, 5, 9, 13	Beat 2, 6, 10, 14	Beat 3, 7, 11, 15	Beat 4, 8, 12, 16
X	Na dhin	Dhin na	Na dhin	Dhin na
2	Na tin	Tin na	Na dhin	Dhin na
O	Na dhin	Dhin na	Na dhin	Dhin na
3	Na tin	Tin na	Na dhin	Dhin na

Table 7. Exercise 1: *Tintal* in *dugun lay*—double speed or two *bols* per beat.

Clap, count, or wave gestures	Beat 1, 5, 9, 13	Beat 2, 6, 10, 14	Beat 3, 7, 11, 15	Beat 4, 8, 12, 16
X	Na Dhin Dhin	Na Na Dhin	Dhin Na Na	Tin Tin Na
2	Na Dhin Dhin	Na Na Dhin	Dhin Na Na	Dhin Dhin Na
O	Na Tin Tin	Na Na Dhin	Dhin Na Na	Dhin Dhin Na
3	Na Dhin Dhin	Na Na Tin	Tin Na Na	Dhin Dhin Na

Table 8. Exercise 1: *Tintal* in *tigun lay*—triple speed or three bols per beat.

Clap, count, or wave gestures	Beat 1, 5, 9, 13	Beat 2, 6, 10, 14	Beat 3, 7, 11, 15	Beat 4, 8, 12, 16
X	Na dhin dhin na	Na dhin dhin na	Na tin tin na	Na dhin dhin na
2	Na dhin dhin na	Na dhin dhin na	Na tin tin na	Na dhin dhin na
O	Na dhin dhin na	Na dhin dhin na	Na tin tin na	Na dhin dhin na
3	Na dhin dhin na	Na dhin dhin na	Na tin tin na	Na dhin dhin na

Table 9. Exercise 1: *Tintal* in *caugun lay*—quadruple speed or four bols per beat.



Audio Example 5. Kippen *Tintal* Exercise in Speeds (CD Track 5).

Mixing Thekas and Tals to Create New Ratios

For the next exercise cited by Kippen, the student also keeps *tintal*, and increases the speed relative to the beat to one and a quarter, one and a half, one and three quarters and two times the original, but recites the *bols* for ten beat *jhaptal*, twelve beat *ektal*, seven beat *rupak* and then back to *tintal*, respectively.

Relative speed	Tal (beats)	Ratio to original	Lines	Repetitions of <i>tala</i> cycle
1 ¼	Jhaptal (10)	5:4	Two lines of 5 bols / 4 beats	Two repetitions of jhaptal
1 ½	Ektal (12)	3:2	Two lines of 6 bols / 4 beats	Two repetitions of ektal
1 ¾	Rupak (7)	7:4	One line of 7 bols / 4 beats	Four repetitions of ektal
2	Tintal	2:1	Two lines of 2 bols / beat	Two repetitions of tintal

Table 10. Exercise 2 summary.

Clap, count, or wave gestures	Beat 1, 5, 9, 13				Beat 2, 6, 10, 14				Beat 3, 7, 11, 15				Beat 4, 8, 12, 16			
X	Dhi			Na				Dhi				Dhi				Na
2	ti			Na				Dhi				Dhi				Na
O	Dhi			Na				Dhi				Dhi				Na
3	ti			Na				Dhi				Dhi				Na

Table 11. Exercise 2 Excerpt: Gesturing in *Tintal* While Reciting *Jhaptal Bols*, *Sawa'i Lay*, or Five *Bols* per Four Beats.



Audio Example 6. Kippen Jhaptal Over Tintal Exercise (CD Track 6).

Superimposing Other Cycles with *Four*

The third exercise relayed from the Lucknow *gharana* by Kippen involves tapping with the two hands only; one hand keeps a steady four beat while the other hand taps cross rhythms against (or

with) it, from one up to sixteen, in the same time duration as the steady four beat. Without the *bols*, *thekas* and other culturally rooted approaches, this exercise comes very close to the type advocated by Toro, or especially by Peter Magadini, who prefers a primary cycle of four beats and who also studied in India. (Toro 1995, 1993a, 1994; Magadini and Sykes 2001; Magadini 1995) Visually, it would look something like this:

One hand taps the <i>four</i> -beat cycle, the other hand adds the following cycles, one at a time:									
1	2	3	4						
1									
1	2								
1	2	3							
1	2	3	4						
1	2	3	4	5					
1	2	3	4	5	6				
1	2	3	4	5	6	7			
1	2	3	4	5	6	7	8		
1	2	3	4	5	6	7	8	9	
1	2	3	4	5	6	7	8	9	10

Figure 2. Exercise 3: Superimposing Beat Cycles *One to Ten With Four*.



Audio Example 7: Kippen Cycles 1 to 10 with 4 (CD Track 7).

The preceding exercises, much like those outlined in the section on Carnatic rhythm, are like games to challenge the *tabla* student and develop his or her facility at rhythmic manipulation within the *tal* cycle. The bulk of the student’s training is of course spent working on technique—including a good sound, hand placement and dexterity with many combinations of *bols*—the memorization and performance of compositions, and improvisation. Much of this discussion has focused on the preceding

exercises as they are more accessible to the reader than the experience of learning compositions, and because they present a general approach to the development of rhythmic sense, like the methods of Efrain Toro. In addition, many of the compositional forms are in fact specific ways of developing improvisations with given material (from the *theka*, for example), and utilize the rhythmic versatility developed initially through exercises such as those above.

Summary

To summarize this brief introduction to Indian classical rhythmic concepts:

The rhythmic concept in India has been developed over many centuries; The Carnatic music of Southern India today presents the modern version of this development, relatively untouched by foreign cultures. It is a highly organized system, more strict in its adherence to the approach passed down and developed since Vedic times.

The Hindustani system of North India is the result of the cultural interaction between Hindus and Muslims; this hybrid culture is also quite old by western standards, at nearly 1000 years, but the rhythmic system in present use is likely not more than 200 years old. It combines features of the Carnatic system (in particular the use of *bols* to articulate rhythmic ideas and compositions, the use of various *tal* structures in a variety of metres, and advanced rhythmic manipulation using a variety of beat subdivisions and groupings) with an accented *tal* structure capable of supporting melismatic expression. This *tal* structure is expressed and maintained by the *theka*, a rhythmic groove that is unique to each *tal*. The *theka* is also used as material for rhythmic manipulation, particularly by altering the speed at which it is played against the *tal*. It can be added that the *theka* must be ornamented by the drummer, and that a few of the compositional forms besides *theka* include:

Peshkar: A loosely structured compositional form which introduces the *tabla* player using more ornamentation and variation of the original *theka*. *Peshkar* often introduce fragments of *kaida* themes before evolving into full *kaida* presentation.

Kaida: An extended composition which introduces a main theme and proceeds to develop variations while also continuing to restate the main theme (rhythm and variation).

Rela: A short *tabla* composition comprised of basic strokes which, when played quickly, becomes very exciting and climactic. *Relas* can develop variations like *kaida* themes, but this is not a prerequisite for performance⁴⁰. (Leake 1986, 13)

⁴⁰ The suggested order of performance in one video lecture by the *tabla virtuoso*, Zakir Hussain, is: *peshkar-kaida-fixed composition-rela*. (*Zakir Hussain Lecture and Demonstration of Tabla* 2007) For extended descriptions and examples of these forms see appropriate sections in Leake and Kippen. (Leake 1986; Kippen 1988)

Findings: Examination of the Harmonic Perspective in Depth

This chapter comprises the core of the work, explaining and testing the methods and perspective under scrutiny.

The 'Ethnographic Insider'

In order to present and elucidate the findings of the research conducted with Efrain Toro, I will for the time being suspend some judgments and critical discussion thereof in order to present 'reality' as he presented it to me. I admit that I have come to share many of the conceptual underpinnings through which Toro operates; others we shared before our interaction. An example would be our shared enthusiasm for the rhythmic potency of 'ethnic music,'⁴¹ especially, but not limited to that of the African Diaspora. This, indeed, is a major precursor to my interest in Toro's work and vision, and therefore a precursor to this study.

Hence I will take on the role, for now, of 'ethnographic insider.' This will entail a certain indulgence in the mentor/apprentice relationship, made easier by my interest in the subject and by Toro's, 'breath-taking' skills in rhythmic performance. ("DC Live Chat") That is, it is easier to consider his ideas as fundamental and true presuming that these ideas have facilitated the unique sort of performance mastery he demonstrated on nearly every occasion we met. Doubts and critical discussion, for the most part will be found in the analysis chapter.

Difficult Terminology: Explanations and Modifications

Here I will attempt to explain and adjust Toro's conversational terminology to the rigors of academic inquiry.

'Ethnic'?

I believe a sensible introduction to the findings can be found in a description of the goals of the method. Prior to that introduction, however, a bit of background is necessary. I have already used, after Toro, the term, 'ethnic music.' This term would likely cause a great deal of discussion and contention if left without explanation. For example, who, and what kinds of music are 'ethnic'? Perhaps, more to the point, who or what music is not? All people come from ethnic traditions, whether they attempt to be cultural standard bearers or not. And just as certainly, those who do not align themselves with an orthodox presentation of their culture are still affected by it and/or by the wide variety of more or less 'pure' cultural manifestations to which a person/artist will be exposed. This begs consideration of the question, what is a 'pure' cultural position? All cultures evolve and change, all the time. This phenomenon is arguably more rapid and the transformations more sweeping with

⁴¹ A description used by Toro which will be defined and re-branded in due course.

ever broader exposure to the variety of extant cultural manifestations, through widely available digital media and ever more multi-cultural societies; this is in addition to the influence of ideas aimed at liberating our conceptions of what is acceptable *and* of what is possible. (There is also the possibility of reactionary orthodox-ism, with the view that alteration equates to loss.) However, despite the recent rapidity of cultural change (I resist the possible bias in the word 'evolution' here), I would hold that cultural change itself is, nevertheless, not a new phenomenon.

Even if cultural change were a relatively new phenomenon, where then would we draw the 'line of purity'? One hundred years ago? Before Europeans began to colonize most of the rest of the planet? Before the Vikings sailed or before the East African *dhow* culture began? Before the Mongols first learned to ride horses, or before 'Mitochondrial Eve' first found her way across the Red Sea? I think it is clear there is no such line.

Still the term 'ethnic music,' though inadequate, does not represent nothing at all, for those of us who are passionate about *older* cultures, and their music. I have spent a good deal of energy trying to explain to urban South Africans, for example, that the 'drum circle' phenomenon represented in certain night spots and corporate boardrooms, though played on African style instruments, has little to do with the West African drumming traditions it purports to represent, consciously or not. In vaguely similar fashion, to the rhythmically sensitive ear salsa dance music produced on a drum machine is a far cry from Cuban *Rumba*, and electronic club music with a sampled *tabla* sound is a quite different phenomenon from a *tabla* solo by a player that has completed a twenty-year intensive apprenticeship under a *guru* that represents an unbroken chain of rhythmic mastery going back several hundred years (or considerably more depending on how the lineage is traced.)

After some thought and discussion with Dr. Kathryn Olsen, I have therefore sought to preserve Toro's intention but in a more appropriate term. I believe the concept he is trying to convey refers to music that is aurally transmitted, from some sort of established lineage of performance practice. This excludes, with no attempt at judgment, those artists who have learned their music mostly from written materials (which of necessity have been rhythmically intellectualized) and those that have created music of their own volition with little or no reference to a traditional apprenticeship relationship. It includes, however, those that have managed to imbibe one of the older, previously apprenticed traditions by ear, the so called, 'natural musician.' In contemporary culture, this might happen with the aid of recordings, and more recently, videos to be found online and elsewhere. This arrangement of terms and concepts obviously makes for grey areas. It is therefore perhaps not entirely effective to abandon the aforementioned term or to pretend that I can find one that is unbiased, but I will attempt to find a working replacement nevertheless. It is not my intention to focus

on these grey areas but rather to see what these necessary generalizations can add to the discussion. I have therefore decided to group the terms Aurally Transmitted Music, Aurally Transmitted (Trained) Musicians and so on under the label AT/Music(s), or AT/Musician(s), etc., depending on the requirements of the discussion. I hope this convention will be clear enough and memorable enough,

And 'Natural'?

Furthermore, Toro frequently refers to 'natural musicians,' suggesting as well that in aural music cultures such as those found in West Africa or in the Afro-Caribbean folkloric culture that was his own early milieu, these individuals are unschooled in music; they rather excel at it through their own volition, as opposed to being trained in a conservatory. I originally balked at this notion, as, having spent four years among West African musicians in Côte d'Ivoire, Mali, Guinea, Senegal and other surrounding countries, I knew there was indeed an educational system in place. These musicians were almost invariably trained in an apprenticeship fashion. Arrangements were made between the family of a young musician and an older, established group leader. From the age of perhaps six or ten, the young neophyte played with the leader's ensemble for three, five, ten years or more. These young musicians were thus immersed in an extended, professional, public, performance experience of their cultural music tradition; they did not spontaneously create it from nothing. Thus these 'natural musicians,' in my experience, are able at a young age to demonstrate considerable rhythmic sophistication, breadth and depth of repertoire, and especially, *dimensionality*. The aforementioned African and Afro-Caribbean traditions, among many others in the world, function as *lineages* is passed on by *apprenticeship*.

However, I have since come to agree that many ATM practitioners might be labeled 'natural' or 'unschooled', in the specific sense that they are mostly *taught by rote*, hence the choice of the ATM label. It most certainly *was* my experience that the apprenticeship mentioned previously was mostly without analytical and theoretical support. Though I do not support the idea that music is a language, universal or otherwise, because it conveys no specific meaning, I find language to be a good metaphor for many musical practices and concepts. In my experience of the apprenticeship system in West Africa, music was passed on as language is. The apprentice listened, tried, was corrected, and tried again. Discussions of musical concepts such as time signatures, keys centres, anacruses, harmonic structure or codas were completely absent.

I am *not* suggesting these concepts should be done away with, nor am I advocating 'primitivism.' I am merely setting the stage for a discussion of world musical cultures, as presented by Toro, and as

experienced by me, in reference to rhythm in particular. On this stage I will examine and yes, generalize about, some of the music cultures of the world, their strengths, aesthetic loci, and pedagogical approaches.

Also, inherent in the idea of the 'natural musician' is the understanding that some exceptional individuals manage to imbibe more of the syntax and technique of their musical system than others. These individuals stand out, often at a young age, and seem to 'get it' while others require long years of dutiful study to arrive at a similar level of mastery. Toro showed me several example videos of child musicians who were 'connected', in his terms. This is another, related, more individual use of the term, 'natural musician.'

Efrain Toro: Background and Theoretical Stance

Though he grew up in Puerto Rico and learned music experientially, by listening and playing, Toro went as a young man to study classical percussion at the New England Conservatory in Boston. As he confides, he is rather fortunate to have had both perspectives. (Toro 2012j, 2014b) At the conservatory, he obviously bettered his reading, and played with an orchestra for the first time, but he also learned about the fine points of classical technique. He said for the first six months, his instructor would not even let him touch the instrument, insisting rather that he perfect his motion. (Toro 2011a) He also learned to analyse music: form, orchestration, harmonic structure and, essential to reading and writing, rhythmic structure. A notion of structural comprehension helps to write or read the correct pitches, but it is not essential. With absolute pitch or a reference instrument, one can easily play or write the notes 'G', 'Bb', 'Db', 'F', with no idea that an Eb9 chord is implied. While that knowledge certainly makes things easier, it is not essential. In rhythm, however, comprehension is essential to transcription or performance from the written score. What is an eighth note, after all, without reference to the beat, codified and specified in the time signature? Though moving to a rhythm is as natural as can be, a knowledge of structure is essential to work with written rhythm.

Toro still works continuously on his motion, his rhythmic comprehension, and the flexibility to play in any style, exploring new combinations and approaches to repertoire and improvisation. He is not bound to any one tradition or school of thought but is rather inspired to work by the prospect of his own development, comprehension, and flexibility. He will go so far as to look down at AT/Music styles as 'dogmatic', noting the limitations of only working with one style, of seeing the musical landscape through one set of lenses, one type of technique. Likewise, he contends that the Indian Classical pedagogical tradition (in many ways an analytical, absorptive, 'classical' style but still founded on aural transmission) is slow and limited in the musical scope it offers the student.

But, at the same time he contends, 'Ethnic music is where it's at!' (Toro 2011a) His method books are largely based on rhythmic patterns from Afro-Caribbean and Spanish popular music. He regularly gushes about Flamenco as, 'the most advanced ethnic music on the planet,' and arguably his favourite percussionist, Zakir Hussain, is a product of the very same Indian tradition he criticizes as pedagogically inefficient.

A Dichotomy

One of my early challenges in this study centred on how I could resolve this apparent contradiction between the AT/M/repertoire centred and contemporary, analytical and/or universal approaches to the rhythmically oriented musics that have been among my primary inspirations. My early interactions with Toro became for me a period of existential angst, not only for the difficulty in making sense of this mentor in the context of my doctoral work; I also was coming to believe in Toro's ideas about the universality of technique and rhythmic comprehension. But, I had for years believed in the apprenticeship process, in the power of traditional repertoire to give the novice the vocabulary and expressive capacity to become a competent rhythmic specialist like the ones that had moved me from various West African, Afro-Caribbean, Afro-Brazilian, Indian and other AT/Music genres. Suffice to say that with few exceptions, Western trained, conceptually oriented percussionists had impressed me on occasion, but not *moved* me in the way exponents of those other genres had. To each his own, of course, but to hear a similar impression from someone with Toro's background bolstered my position thus increasing a personal dilemma.

A Resolution: Dimensionality

As it turns out, the resolution of this dilemma is fundamental to understanding the vision behind Toro's methods, and to the resolution of my own existential drama. The answer lies in dimensionality. The reason I had been drawn to African music many years before hearing of Toro, and the reason that Toro says, 'Ethnic music is where it's at,' is that these musics, in varying degrees, manifest an ever-present multi-dimensionality in their rhythmic structures. This phenomenon is most pronounced in music of the African Diaspora, which manifests simultaneous beat structures based on *three* and *two* at all times. (Toro 1995; "Polyrhythm" 2014; Kubik 2010; Peñalosa and Greenwood 2009; Novotney 1998) It also appears that this simultaneity manifests not just as permutations of *three* and *two* but of higher order prime numbers such as *five* and *seven* as well. (Toro 1994, 2012) The concept of rhythmic multi-dimensionality is most developed in Indian classical music, though here it is conceptually derived and linearly delivered, or one line/beat structure at a time, in succession.

For Toro, and increasingly in my own perceptions and point of view, AT/Musics have such a draw—the power to move people to dance, among other qualities that make music attractive to the human psyche—because of this simultaneity of multiple ideas and organizing structures. They continue to offer the world a great many models of how to do this, from the sub-beat levels of rhythmic structure responsible for different 'feels' (ways to interpret the subdivisions of a beat structure) to the larger levels characterized as metre.

But, for Toro, these AT/Musics are dogmatic, or rather some of their practitioners are, insisting their way is *the* way, their music is *the* music. More significantly, relatively unaware of the qualities of their music that engender feelings of centred-ness based on simultaneity of stimuli (more on this later), they focus pedagogically rather on passing on the patterns and compositions as they were passed on to them; the multi-dimensional structures, the universal archetypes and techniques of playing are less discussed in teacher/pupil relationships, or not at all.

The Proof is Within

One might ask, of course, how can we know this? How can we make such broad generalizations? There are exceptions. Toro himself is one of a growing number of musicians from ATM cultures who find themselves later in a conservatory or other (probably jazz) educational environment and manage to embrace both hypothetical perspectives. As a broad generalization in the state of musical knowledge and pedagogy, however, I can say that this dichotomy between aurally transmitted, repertoire-only knowledge and analytical/theoretical knowledge has been prevalent in my experience; it seems to be so as described in the literature. (Chernoff 1981; Berliner 1978; C. Keil and Feld 1994) And, it seems to represent the state of music pedagogy in Toro's rather lengthier, well considered experience. I would also ask, again, that the reader suspend critical inquiry on this point, just for a while, and consider, in their own experience, the predicted results of the hypothesis in the state of world music. Do there not seem to be mostly opposing approaches to rhythmic and musical comprehension? Is there not one side, represented by the musical intelligentsia, who, despite a great deal of knowledge and skill, cannot find the downbeat in AT/Musics or who are perplexed to understand or notate the feel of African or Brazilian music? (Polak 1998, 2010; Gerischer 2006) Are there not orchestras and orchestral players who play brilliantly from the written, European classical canon but who produce rhythmic music (pop, jazz, or otherwise) that sounds stiff and wooden⁴²? In his book about African rhythm from a Ghanaian perspective, Chernoff also underlines this dichotomy:

⁴² There are many notable counter-examples, of particular recent interest is the Venezuelan El Sistema program. ("El Sistema" 2014)

In Western music, then, rhythm is most definitely secondary in emphasis and complexity to harmony and melody. It is the progression through a series of chords or tones that we recognize as beautiful. In African music this sensibility is almost reversed...in African music there are always at least two rhythms going on. We consider the rhythms complex because often we simply do not know what “the” rhythm of a piece is. There seems to be no unifying or main beat...Exposed to the music of an African drum ensemble, even the most accomplished Western musicians have expressed bafflement.” (Chernoff 1981, 42)

A rhythmic perspective that relies on one “unifying or main beat,” is perhaps, as Chernoff suggests, at the root of Western trained musicians' “bafflement.” On the other side of the coin, Chernoff relates this story with a clerk in the airport:

The two of us went to a little desk in one corner, and then the man began typing. I flipped. Using the capitalization shift key with his little fingers to pop in accents between words, he beat out fantastic rhythms. Even when he looked at the rough copies to find his next sentence, he continued his rhythms on the shift key. He finished up each form with a splendid flourish on the date and port of entry. I thanked him for his display, and though I regretted having to leave the customs office, I was eager to go out and begin my work, for I realized that I was in a good country to study drumming. (Chernoff 1981, 94)

Consider as well the widespread use of drums and other instruments to reproduce speech in many West African languages, and the contingent necessity of hearing precision in rhythmic relationships by people 'untrained' in music, and it becomes more plausible that perhaps the near universality of rhythmic perception and skill in those cultures is related to their lifelong exposure to multi-dimensional archetypes.

Even more to the point, A.M. Jones says, “We have to grasp the fact that if from childhood you are brought up to regard beating 3 against 2 as being just as normal as beating in synchrony, then you develop a two-dimensional attitude to rhythm which we in the West do not share.” (Jones 1959, 1:102; Chernoff 1981, 94)

From still another perspective, is it not the primary *raison d'etre* of the discipline of Ethnomusicology to analyse music from an institutionalized, primarily Western point of view? In the African context, the primary source of multi-dimensional rhythmic music, and thus a pillar of this study, this includes the work of early pioneers (some of whom went on to update their theories with the times) such as von Hornbostel, Waterman, Jones, Blacking, Merriam, Brandel, Koetting, and Hood, to modern theorists who helped to develop the current, generally accepted platform of understanding—Nketia, Locke, Agawu and Kubik. (von Hornbostel 1928; Waterman 1948; Jones 1959; Blacking 1955; Merriam 1981; Brandel 1984; Koetting 1970; Hood 1963; Nketia 1974; Locke 1998; Agawu 1995; Kubik 2010) The sincere analysis of less-than-analytical traditions leads again

to the dicey dichotomy of perceptual stances centred on implicit and explicit knowledge bases. And, on the performance side of the coin: Brilliant cultural standard bearers who cannot read a note of music; students who cannot pass their theory classes but who are first call in working, professional bands, even over their own professors.

One of the central tenets of Toro's pedagogical stance is the attempt to bridge this gap between a mostly un-theoretical coterie charged with preserving and passing on the rhythmically multi-dimensional, AT/Musics of the world on the one hand, and theoretically minded 'modernists' on the other; in this case the designation 'modernist' includes anyone who creates primarily from an intellectual or technical perspective, or who draws inspiration from those musical forms that have been thus created, with little or diminishing reference to the AT/Music sources. Such a 'modernist' (I keep the term in inverted commas to note its intended meaning here, as well as its use as a generalization) might come from such diverse perspectives as the Western classical, that of the university-trained jazz musician, or the rock drummer, all of which might be found to derive their rhythmic concept from a primarily linear, relatively simplistic (less dimensional) approach.

Multi-dimensionality 1

An example from my discussions with Toro is appropriate here to better illustrate the situation. He was talking about *five* in one of our lessons, when, while playing in two, he produced the following figure:

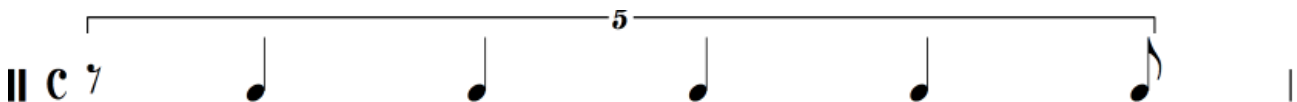


Figure 3. Offbeat *Five*.

Below is the transcript from our interaction:

ET: Most used melody in Latin music!

JD: Hm.

ET: They're fives! On the offbeat! They're fives on the upbeat. Who in a conservatory can play fives on the upbeat? Or anywhere? We do it all the time!

JD: So if 'normal' people transcribe that in music, do you think they would write that? Do you think they would write...

ET: No!

JD: What would they write?

ET: They would write...

JD: ...a sextuplet or something?

ET: No, they would write this (he writes the second two triplet partials of one beat and a full triplet after, as below).



Figure 4. A Conservative Estimate.

JD: Oh. *And* triplet...Da da DA da da.

ET: You see? And so, this is the problem. This is the problem, it's like that.

JD: They want to make everything triplets and...

ET: Well, we learn a separate way. And that (sitting back at kit, points toward paper on desk)...that is not *five*. That is something else. Right? But then when they play, it sounds like *five*, but they don't know what they're playing because what they're playing doesn't match the music... You see?

JD: Mm. And the guys that learn from notation, they don't understand why they can't get it... why they don't sound like...

ET: That's correct. And so, do you see this is a problem? There's a problem in education, in music. (Toro 2012j)

The reader will note that both figures articulate the second beat (or the upbeat in the bar, or metric scheme. This is one of the central tenets of Toro's approach and will be discussed later), but that the offbeat *five* figure, being evenly spaced, produces a pronouncedly different feeling, as if referring to two perspectives other than that of the predominant metric scheme; namely, the feeling of the offbeat, and the feeling of *five*. This very minor difference in rhythmic placement is thus highly significant, at least to the rhythmically refined ear, as it refers to at least three dimensions—they might be called 'dimensional referents'—at once, including the predominant scheme. Thus, with the smallest of changes we go from relatively basic to profoundly multi-dimensional.



Audio Example 8. Offbeat *Five* and Triplet Figure (CD Track 8).

Ways of Knowing

Toro's commentary is insightful as well; He didn't stick to my rather narrow first impression that the hypothetical conservatory musician would understand, 'everything as triplets,' but rather that they (we), 'learn a separate way.' This begs the epistemological discussion referred to in the section on experiential knowledge (chapter). What we think we know can take precedence over what is. But if we only perform, we are either right, wrong, or somewhere in between. Toro himself was quite clear on many occasions that he sees no conflict whatsoever between intellectual (explicit) and experiential (implicit) or corporal knowledge. A portion of one such conversation is transcribed below. I would usually maintain that this was the ideal to which we should aspire, but that in practice, the intellectual/explicit knowledge could indeed interfere with the pure experience of what

is, or, what is being done. This is one case that seems to illustrate the potential conflict.

ET: They're ('natural musicians') connected because it's in nature.

JD: Yeah, because that's all they have. Knowing something in your head takes you away from nature.

ET: No, it doesn't.

JD: But it can...

ET: No. It's wrong. That point of view is wrong. And unless you change that in your nyye (hands to head), it's going to be very difficult for you to learn anything. There's no conflict between intellect and the natural world...at all! There's no conflict! And intellect adds to the natural ability. Intellect it just doubles...it just doubles your understanding of what is natural, and it adds, it embellishes, it enhances...the natural. And so, in the western world, we have a problem, that comes from a religious point of view. Things we don't understand are mysteries. Mysteries are good. Ok? Because mysteries are things that are unexplainable. And in the religious belief, it works great! We're so indoctrinated, by that popular belief, that we think that by knowing something, we'll take away from the essence of what it is, and it's not true...it's just not true. (Toro 2012m)

On this point, I maintain that in my experience, too many strains of thought competing for conscious attention can dissipate the pool of cognitive energy available for any one strain, whether that is an analytical concept being developed and/or maintained, or whether it is un-differentiated awareness of experience. As musicians, we must learn to direct our awareness to analysis, harmonic progression, experience of musical stimuli, experience of our own body, sound or musical line being developed, the interaction we create with other music makers, spectators, dancers, and so on. More experience or capacity can allow us to handle more of these factors with aplomb, as we eventually learn to simultaneously walk, talk, chew gum, plan our route, and adjust for the changing weather or unexpected pangs of hunger—each of these tasks being a challenge on their own for a toddler. (Elliott's thinking-in-action concept might lead from there to artistic mastery.) As far as choosing to maintain a sense of mystery by refusing to adopt an analytical perspective, I feel Toro misunderstood the angle of my interjection. Perhaps it is true that some (apparently a great many in Toro's experience) prefer this perspective. Whether it is a common belief that a mystery-endorsing stance increases one's artistic prowess or rather, that it represents a certain disinclination to engage in analytical process is a hypothetical question I will leave outside the central concerns of this study. Still it remains in my experience here at the University of KwaZulu-Natal and elsewhere in the Durban musical scene that some of the most 'connected' musicians do not in fact seem able or inclined to discuss the workings of their music on a structural level, and a good many apparently struggle with their theory classes. I find the reverse is also quite common.

Another perspective on this division of mental tasks comes from cognitive science. Hearing specialist and saxophonist Charles J. Limb, along with neurologist Allen R. Braun have been studying the

brains of improvisers using functional magnetic resonance imaging (fMRI). By having musicians play memorized pieces as well as improvising on a midi keyboard while inside the imaging tube, these scientists are looking for keys to the functional brain activity present during a creative act.

When asked what happens neurologically to the brain during creativity, Limb responded:

As far as my studies have revealed, creativity is a whole-brain activity. When you're doing something that's creative, you're engaging all aspects of your brain. During improvisation, the prefrontal cortex of the brain undergoes an interesting shift in activity, in which a broad area called the lateral prefrontal region shuts down, essentially so you have a significant inhibition of your prefrontal cortex. These areas are involved in conscious self-monitoring, self-inhibition, and evaluation of the rightness and wrongness of actions you're about to implement. In the meantime, we saw another area of the prefrontal cortex—the medial prefrontal cortex—turn on. This is the focal area of the brain that's involved in self-expression and autobiographical narrative. It's part of what is known as a default network. It has to do with sense of self...If we can understand what actually changes in the brain to perhaps reduce conscious self-monitoring—what a lot of expert musicians are doing and what amateur musicians are unable to do—that's a pretty interesting target for someone to consider when trying to learn to become an improviser. I think that has implications for describing what gives rise to excellent improvisation and what experts do naturally. (Anstead 2014; Limb and Braun 2008)

It seems then, that an engrossing, multi-dimensional musical activity such as improvisation requires us to curtail certain brain functions. To restrain self-monitoring and self-inhibition makes sense. I see, however, a connection to the relationship between explicit and implicit knowledge in Limb's idea that we also turn down the brain areas responsible for “evaluation of the rightness and wrongness of actions you're about to implement.” This can be interpreted as similar to self-monitoring, but could imply an evaluation of theoretical correctness (of explicit knowledge) as well. The point I wish to make, alluded to above and from my own experience, is that *maybe* too much thinking can get in the way. I believe most performers and coaches would agree.

Yet another angle, or distilled version of this discussion, is one that comes up for me most every day in the evolution and consideration of my practice routine. That is, how much, if any, of our time should we spend on structural, stylistic analyses of the music we are attempting to learn? Is it rather more effective to surround ourselves with well performed examples of the style(s) and imbibe them with all our senses, as we did learning our first languages, practicing and absorbing in continuous succession? Note I have not indicated a learning modality; I think the discussion applies to learning from notation as well as from recordings, videos, memory of live performances and so on. The Western Classical teacher will say that some degree of analyses is helpful if not vital to memorization, and even interpretation, but it is not that sort of repertoire specific analyses I am primarily talking about here. I am referring rather to analysis or consideration of the building blocks of the style, how it compares to other styles, and, what are the universal attributes, if any, that I can learn from

or apply to learning a particular music? This leads to the common practice dilemma of current times: How much time, if any, should one spend working on exercises rather than music per se? With the plethora of pedagogical resources available for most instruments and styles now available, and the associated marketing claims used to pedal them, a person could easily be duped into spending all their practice time on exercises designed to take them to the level of super-musician, all the while not actually playing any music. This state of affairs is probably more difficult to navigate for those interested primarily in improvisatory, as opposed to pre-composed, music⁴³.

Toro has his opinions on this issue as well; that there are far too many useless books, and that all of rhythm comes down to just a few, archetypal and empowering combinations. He also recommends lots of listening and exposure to whatever style one is interested in playing.

ET: All those books...they should all be burned. I had that vision a long time ago. I realized these books... (pulls some more anguished faces). The first time I met with Terry Bozzio (famous drummer with Frank Zappa and others, and friend and student of Toro's) he says there's only six, eight combinations, that's it. That's all of drumming...we're in the same boat. That's all there is. All the other stuff is...

JD: But you wrote some books...so your premise is that they're different, huh?

ET: I had to write those books...and it's just dumb. Its dumb. The only thing you need to practice is very simple. It's these very simple combinations and downbeats, upbeats and dotted notes. So how difficult can that be? That's all! (Toro 2012l)

Nevertheless, his exercises can be quite difficult theoretically and technically, especially if taken to the fluency and tempos that would make them directly applicable in music; the question of whether to approach musical training through analytically derived exercises versus simple listening and playing presents itself here as well. The answer, for me, as alluded to above, is that it is indeed difficult to play well *and* to comprehend on a structural, *explicit* level, but that this combination of modalities is what allows musical pioneers to potentially take their music in new but informed directions. As with biological evolution, musical evolution has always depended on cross-pollination. Unlike biological cross-pollination, however, artistic cross-pollination can be influenced by the knowledge of the musical 'parents', the artists themselves. The reproductive structures of two varieties of a species, barring genetic modification by humans, are either able to combine or they are not. With art, however, while it is often true that new combinations 'simply happen', it is also possible

⁴³ Internet educator Chris Cooke gives a more thorough discussion of this 'exercises versus music' point of view (while attempting to sell his own system). (Cooke 2017)

for the knowledgeable artist(s) to carefully forge new directions in their art, based on their understanding of several styles, and/or the application of universal archetypes that they understand to be such from careful, creative, informed investigation.

From yet another perspective, if we consider music reading as the locus of the structurally informed musician, and playing 'by ear,' or 'by heart,' as the realm of the non-structurally concerned 'un-schooled' musician, we can pose the language analogy again. Few would doubt the value of literacy as one of the principal capacitors of human kind; consider, however, the idea of being able to read and write but unable express oneself verbally. Surely, as important as the former is, it is based on the latter. It is our expressive capacity that is our communicational foundation. (Winberg 2007) Thus, once again, we see through analogy and through countless examples in the jazz, commercial and classical world—the 'modern' world of working, flexible musicians—that the ideal is to have both: To be informed and expressive, to be able to absorb new material theoretically but also with the expressive nuance that can be described and reached for in words and lessons but which always exists at some deeper level in the individual's ability to hear, and to produce, through their own body and instrument, that ever-nearer-to-direct conduit between hearing and expression, between felt and expressed emotional potency.

Bolstering Expressive Capacity: A New Rhythmic Paradigm

The hypothesis herein is that the side that needs conceptual bolstering, in the schooled musician, at least, is that which is largely left to fate in traditional (western) music lessons, namely, the expressive capacity of the student. Only one component of this capacity will be considered here, but it is arguably the most significant: Rhythm. This is not to say that traditional music teachers do not have many effective ways of teaching rhythm, but instead that the perceptual grid that is taught and, significantly, that is conceptually and perceptually engrained, is limited. It is hypothesized that by working with a new, more extensive model such as that proposed by Toro, the possibility of both conceptual (explicit) and perceptual/implicit understanding will be available at a much finer, *multi-dimensional* resolution, thereby decreasing the gap in rhythmic command, flexibility, and groundedness that tends to exist between the experts of AT/Musics and those of more theoretically concerned pedagogical systems. Such a new model offers the AT/Music proponent, including those from outside the original cultural *milieu*, a more comprehensive theoretical position from which to understand and master their craft. It also offers the theoretically minded a broader rhythmic model from which to work, thereby deepening expressive capacity and/or facilitating the understanding and potential influence from the arguably more rhythmically sophisticated traditions of the world.

One more analogy: With some pitched instruments, such as fretless string instruments, one must learn to 'tune' every note. Many others only require periodic tuning. Some like the piano, are usually tuned by someone else! In rhythm, however, everyone must 'tune' every note, every time it is played. As tuning systems have been developed to follow Pythagorean tuning, even-tempered tuning, tunings using five, seven, twelve, twenty-two, twenty-four or some other number of notes to the octave, in various intervallic arrangements, so the parameters with which rhythm is 'tuned' can be seen from different perspectives. Some of these perspectives appear to better represent what we hear from the musics of the world than the (western) system in standard use. That said, it is not suggested the current system be scrapped, as some theorists have (Koetting 1970; Arom et al. 2004), only that it be expanded and re-conceptualized.

The Harmonic Perspective of Rhythm Revisited

As the name suggests, this new perspective allows for the consideration of two or more concurrent conceptions of time measurement. This contrasts with a linear perspective of rhythm, in which all ideas—even from distinct metric systems like *two* and *three*—are conceived within one line of subdivisions equal to the smallest division of the beat (the 'lowest common denominator') necessary to represent all. Theoretically, this linear way of thinking can of course account for anything possibly articulated to within a margin of error beyond the range of human perception—think of digital technology in which sounds are represented by discreet and very tiny bits of information that, when interpreted by the playback device, give us a relatively perfect picture of any aural phenomenon we wish to preserve. Conceptually and practically, however, this linear way of thinking seems to fall short of some of the needs of the rhythmically sophisticated human music-maker.

Polymetre

Before moving on I would to clarify an important term and its use in this document: polymetre. I am also going take a controversial stance on its use, but one that I feel is important in the aim of semantic efficacy and necessary for the position argued herein vis-a-vis the harmonic perspective of rhythm. Peñalosa, Agawu and Novotney, in particular, make their case for the term cross-rhythm, applicable to many of the examples to be dealt with in upcoming discussions. (Peñalosa and Greenwood 2009; Agawu 2003; Novotney 1998) Novotney in particular goes to lengths to distinguish cross-rhythm as a subset of the more inclusive term polyrhythm, which he says is, “a general and non-specific term for the simultaneous occurrence of two or more conflicting rhythms, of which, the term cross-rhythm is a specific and definable subset.” (Novotney 1998, 13)

Peñalosa says: “The *secondary beat cycle* is the next tier of the rhythmic matrix. This secondary cycle is composed of *cross-beats* (or *counter-beats*), beats that regularly and systematically contradict

the primary beats. Cross-beats create excitement, rhythmic tension and a sense of forward momentum.” (Peñalosa and Greenwood 2009, 21)

I do not have a problem with this terminology, for the limited context in which they are working: African and Diaspora accompaniment patterns with a predominant main (primary) metre and other, secondary cycles related by the regrouping of subdivisions in twos and threes. Toro, as will be seen shortly, uses this process as a substantial part of his method for increasing rhythmic perception and catalysing interdependence in performance. However, though African music was said to be poly-metric by Chernoff (and earlier scholars, Jones, King, Brandel), the general state of scholarship now shuns the term. (Chernoff 1981; Jones 1959; King 1960; Brandel 1959)

However, the polymetre that is being thrown out with the proverbial bathwater is that which requires us to think in one metre after another, in additive fashion (such as using sequential 5/8 and 7/8 bars to notate a 12 pulse pattern), as in the transcriptions of A.M. Jones and Rose Brandel. (Jones 1959; Brandel 1959) I agree that their perspectives were skewed, difficult to manipulate, and mostly unrelated to the perspective used by performers of the musics in question. The problem, as I see it, is that the scholarly world thinks immediately and uniquely of polymetre as tactus-preserving polymetre, where the underlying tactus continues, uninterrupted, while the sequentially applied metres change its (the tactus') metric structure. This is a linear, one-dimensional application. Measure-preserving polymetre, on the other hand, allows for different metres to unfold in the same space of time, as discussed throughout this document. This is usually referred to as polyrhythm. (“Meter (Music)” 2014)

Nor do I reject the term Polyrythm, but, as Novotney noted, it is very general, relating equally to an outrageously complex combination like *eight* and *nine*, a simple one like *three* and *two*, or even to two rhythms that are obviously of the same metre but emphasizing different parts of the beat structure so as to 'conflict' in the listeners' mind. (Novotney 1998, 13)

And, though I think cross-rhythm also has its appropriate usage in certain contexts—like the ones discussed by the aforementioned authors—it is also limited. I do agree that most if not all musics are fundamentally based on a primary metric cycle, but other cycles do exist; in complex rhythmic systems like those from Africa and India, they must exist for the music to be aesthetically whole. I propose a return to the implication of the component words, poly and metre. Two metres, in many cases, are occurring; whether they can each be derived with the other's commonly used subdivisional unit is irrelevant. This is a key point where the harmonic perspective of rhythm differs from conventional viewpoints. All polymetres can be derived as cross-rhythms (by the regrouping of a common subdivision) but at a certain point it becomes difficult, as suggested several times in this

thesis. Do we arbitrarily respect some line of complexity as an absolute line, either side of which we change terms, or do we allow the consideration of one measure cross-rhythms to imply different perspectives, and, different metres?

Put another way, certain metres, those with twelve pulses (or subdivisions) in particular, can be divided into several co-existing cycles, or perspectives, at the same time: *two*, *three*, *four* and *six*, to be more specific. They all repeat in one metric cycle, or measure. And yes, I might refer to them as cross-rhythms. However, a cycle of *five*, *eight* or even *nine* can also be used within this measure. *Eight* is quite common in an African Diaspora schema, even as an accompaniment part, but somewhat difficult to derive as a cross-rhythm, requiring as it would, 24 subdivisions; it is much easier to hear it as double the *four*. *Five* or *nine* with *twelve* in the space of one measure would be virtually impossible to think of cross rhythmically. Theoretically, this poses a problem. Realistically it insists that we open our ears *and* our perspectives. As argued here and by Toro, these other metric perspectives are in the music, “All the time.” (Toro 2012f, 2012j, 2012m) This is essentially another perspective on the 'off-beat five' discussion above.

If, however, we were to *regroup* the twelve subdivisions into fives—which would last five measures until resolving (beat 'one' with regroup cycle 'one')—I would certainly refer to this as a cross-rhythm. Its accents also imply, or derive, if you will, a *five* with *twelve* 'polymetre', but that is not the usual way I prefer to use the term, as it is happening over the course of five metric cycles. Cross-rhythm is a much better term, in this case. This phenomenon, incidentally, will be covered in much greater detail in the section, “Linear Modalities” (page 153).

Furthermore, as will be detailed in the section, “Into the Dot: Playing with Perspective” (page 159), the method discussed herein is meant to engender a malleable perspective. If we speak strictly of primary and secondary, foreground and background, it can be very helpful for the student, but ultimately are we not cheating the music of yet another dimensional referent? As these structures—both harmonic (in one bar) and linear (regroupings, cross-rhythms)—become more clear and stable in the body, it becomes possible to hear one from the other and vice versa; that is, to hear *three* from *two* or *two* from *three*. There is still a primary beat structure, yes; in music, this would be the four main beats in most African music or the *tal* in India, but in *rhythm*, perhaps just the *one*.

This study and the theories therein, though largely examined using African music as a reference, are also meant to examine and generate more universal perspectives. Still, though it may be a small point to the strictly African music scholar, the thinking and terminology in current use—i.e., primary cycle and cross-rhythm—seems to hierarchize the whole show, making it one-dimensional; that is, there is one main beat and the others are linear relations. The reader will understand, I hope,

that this is a subtle point, as I still prefer and agree to start from one main metric reference; but the capacity to hold several in mind is, I believe, an essential aesthetic for the astute participant. I also hope that the reader will not object to the conceptual use of multiple metric references in the course of this analysis...and that it will become clear as to why.

Finally on this subject, I will attempt to deal with the comment of Justin London that there is, “no such thing as polymeter.” (London 2004, 50) In the preparation stages of this research, I was taken aback by this rather blunt statement. Now, with a few allowances added, I can consider it as a possibility. The allowance I refer to in particular is this: I would prefer if London would have included a qualifying term such as, 'psychologically,' or 'consciously,' before his bold statement. This would imply that the part of our mind we normally think of as waking consciousness (and which, in the course of this study, has appeared to me to be a significantly linear apparatus) is not in fact able to attend to two metres at the same time, but rather jumps quickly from one to the other. Even with a fair bit of experience in this arena, I cannot say that such a statement would be categorically wrong. However, I would argue, that we certainly do manage to *play* polymeters. And, moreover, music with multiple metric references seems to exhibit a great power to entertain, and even to overwhelm the mind, in rare cases to the point of trance. This is a controversial subject, outside the bounds of this discussion. However, regardless of whether people enjoy, are moved by, and/or potentially overwhelmed by multi-dimensional rhythmic phenomena because they manage to perceive several of these dimensions at once, or because their minds are quickly jumping back and forth between them, the fact remains that we are able to play them. We play them in group settings, but also as individuals. Toro's methods push that envelope further than any other I know. My view is that if one person can maintain polymetre, some part of his or her consciousness must therefore be able to perceive it. From a linear (regrouping) perspective, it is easy to play *three* with *two* and several more polymeters of a slightly more difficult nature. But eventually, it is argued herein, that method fails. Even with difficult examples like seven and five, perhaps the mind does indeed jump rapidly back and forth from one metric reference to another (and/or, hears them as one composite melody), but the body manages to comprehend and execute them. Indeed, the body seems to be able to manage many movement tasks on its own, even some, like driving a car while adjusting the stereo or using a phone that should probably be more consciously attended to! But, if the body can perform two complexly related metres at the same time (not to mention maintaining one, or two, while manipulating the other) is it not implied that the mind is involved at some level? The nervous system, after all,

extends throughout the body, and the mind/body division is, I believe, mostly a discredited notion⁴⁴. It is suggested elsewhere that Toro's multi-dimensional perspective and exercises and even the general process of playing music in a very engaged way, is akin to meditation, which, working well, is contingent on the cultivation of a wide, less acutely focused awareness (Distinct from the 'normal,' linear, conscious thought process). I posit that this is one way the mind/body system deals with the consideration of multi-dimensional rhythmic phenomena. In my experience, polymetre certainly does exist, but I invite London or others to explain a statement to the contrary.

The Linear Approach

Conceptually, we saw in the example of the offbeat five figure that humans seem to be quite capable of dealing with simultaneous or near simultaneous consideration of what would be, in a linear conception, quite distantly related time reference systems (metres). Practically, in order to conceive of such an example, one would have to work with a subdivision of twenty (four beats by five beats) and then, in order to hear or perform the two together, would have to group the twenty into fives (four groups) to articulate the metre of *four*, and into fours (five groups) to articulate the metre of *five*.

Linear Count	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Right Hand	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Left Hand	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Figure 5. The Linear Derivation of *Four* with *Five*.



Audio Example 9. *Four* and *Five* Linear Derivation (CD Track 9).

While it is true that at slow tempos this might be possible for a fairly clever musician, at faster tempos, not to mention in the heat of improvisational use, this method quickly becomes cumbersome and distracting—the epitome of explicit knowledge in its potential to distract from the implicit experience. Moreover, this sort of mental juggling seems to require simultaneous processing of multiple concepts—becoming cognitively 'harmonic'—anyway. And, remember that the example in

⁴⁴ “It is not only the separation between mind and brain that is mythical: the separation between mind and body is probably just as fictional. The mind is embodied, in the full sense of the term, not just embrained.” (Damasio 2008, 118)

question used the *offbeat* of five, meaning we would actually need to count and doubly group not twenty but *forty* divisions per bar. Finally, we have established, albeit in a generalized sense, that in the world at large many of the people who regularly use such devices are not theoretically trained. This points to the possibility that there is another way to approach the problem.

The Harmonic Approach

In a harmonic conception of metre, on the other hand, the two time reference systems (metres) are only related to *one*. That is, they take place in the same space of time; they begin and end in that same space of time; they count beat one together, and so on. *One* is one long beat that lasts the whole metric cycle.

In this conception, these simultaneously conceived metres also relate to the offbeat of *one*, which is essentially the same as *two*. As in a wave, each metre 'checks in' at the offbeat; its second half is either a repetition of the first, in the case of even metres, or, in the case of odd metres, is a symmetrical mirror image about the offbeat. This is why our offbeat *five* figure met up with the second beat (or the upbeat of the entire metric cycle, the *one*.). The *five* figure could also be thought of or derived as the even numbered beats (beats two, four, six, eight and ten) of a cycle of *ten*, which, being even, repeats on the *two*/global upbeat (beat six of ten).

The figure below shows this idea in graphic form and in music notation.

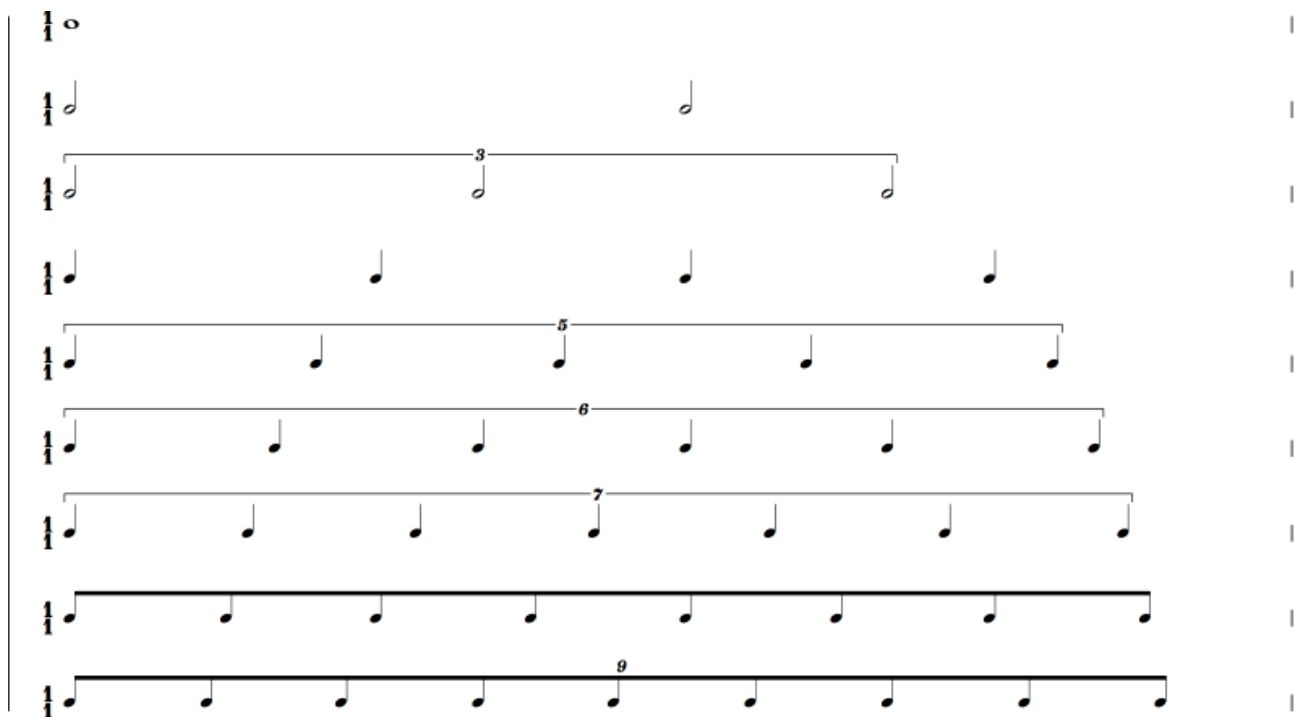


Figure 6. The Harmonic Perspective: *One* through *Nine*.



Audio Example 10. The Harmonic Series (CD Track 10).

The Harmonic Series: Pitch *or* Rhythm

The figure above is, of course, a representation of the harmonic series, using musical notes (here in common, 4/4 or 2/2 time) to represent rhythmic values. The harmonic series is more commonly used as the model for our understanding of the physical relationship between vibrating bodies that produce various, musically related pitches; we hear them as related because they display varying degrees of consonance based on the relationship of their frequencies. When describing musical pitches, these frequencies are expressed as Hertz, or vibrations per second. This same model can serve as the template for rhythmic pedagogy and analysis, but at a different speed; rhythmic frequencies are expressed rather as beats per minute (bpm)⁴⁵.

The analogy extends beyond the mere use of frequency as a measure of pitch or rhythmic speed, however. If we double a frequency expressed as rhythm, say 100 bpm, we get its most closely related frequency, one that is twice as fast, double time, that has more 'energy,' and so on. Depending on the speed and the instruments involved (snare drum or tuba?) this may present technical difficulties to play or to attend to, but there is no real change in conceptual complexity. Likewise, when we double a frequency at the level of musical pitch, we get the most fundamentally related note, the octave. Here again, we might feel more 'energy' (this is more of an emotional concept as the physical energy required to produce a lower note is often greater; think of the low strings on a cello or piano, or the mallet and stroke required for the bass drum versus the tenor or snare drums), and the technique might be more demanding, as for the higher notes of the brass, but, conceptually, harmonically, there is little added. The doubling of the frequency, as demonstrated in the nomenclature, produces essentially the same note, and thus carries the same name.

To produce a different note, rather than the same note in a different octave, the frequency ratios between the first and second notes have to exist in a more complex ratio than 1:1 or 1:2. The next option in the harmonic series is a tripling of the first frequency, or a ratio of 1:3. It is at this point that the discussion can become muddled, but with careful attention, I hope that it will be clear that the next steps produce the fundamental model that we see in both the pitch and rhythmic arenas. The

⁴⁵ Their relationship is expressed by the simple formulae, $\text{bpm} / 60 = \text{Hz}$, and $\text{Hz} \times 60 = \text{bpm}$, but only in octave equivalents would any two values work with our sensory abilities.

frequency ratio of 1:3 gives us the musical interval of a fifth.⁴⁶ That is, if 220 Hz produces the note 'A,' 660 Hz will produce the note 'E.' As the second frequency (represented by the '3') will be higher than the octave already generated by the ratio of 1:2, however, the actual note will be a twelfth higher than the first; the ratio that generates the fifth—the next most common, most powerful intervallic relationship after the octave, and the first to offer a fundamentally distinct note *and* rhythmic relationship—is 2:3. It might help to visualize this discussion on a piano keyboard. The fundamental, or the '1' of the 1:2:3 ratio, might be the note 'C'. The '2' would be the note 'C' an octave higher. The '3' would be the note 'G' above that.

Octaves Do Not Harmony Make

With the interval of a fifth, it is clear that a harmonic conception of pitch is possible, for now we have two *different* notes to work with. Likewise in rhythm, a harmonic concept springs into possibility not with a doubling of frequency—the equivalent of adding an octave—but rather with this foundational ratio of 1:2:3. Essentially, this means the foundation of a harmonic perspective of rhythm is the ratio of 2:3; But the *one* is always a given. The *one* is the unbroken time that the cycle takes to repeat itself. It is the fundamental frequency which generates the others. In rhythm, this is a conceptual relationship to be learned, although in music it is felt quite naturally without any verbal description; *one* is the beginning and end of the cycle to which all variations eventually refer. Thus music can be understood as a cultural representation of the physical world. In pitch, this ultimate reference to *one* is a physical property of vibrating bodies. The basic physics of acoustics tells us that a vibrating body such as a stretched string or the air in the tube of a wind instrument, once set in motion by an energetic force, will vibrate as its longest, fundamental length, and simultaneously at ratios of the harmonic series: integer ratios of that fundamental, as represented in figure 7.4. In his book, *All of Rhythm*, Toro gives this visual reference:

When looking at light from the sun or a lightbulb you will see mainly one color and if a prism is located between you and the light a series of colors that are the components of light will be seen. The same thing happens when you hear a sound from the piano or guitar. For example the note C on the piano is composed of a series of waves vibrating at the same time. You hear not only the fundamental pitch but all of the softer tones that give the sound its quality. (Toro 1995, 1)

⁴⁶ The 'natural' tuning we are hypothetically generating differs from other, human adjusted tunings, in particular the even-tempered tuning in use in the Western world since approximately the time of Johan Sebastian Bach (who made the flexibility of this now ubiquitous tuning to operate in multiple, changing key centres famous in his *Well-Tempered Clavier*). As such, I left out the usual designation of 'perfect' before the 'fifth' as not to dishonestly represent the micro-tonal variations between the naturally derived tuning being discussed and the even-tempered or other tunings familiar to the reader.

In rhythm, the equivalent of the first three frequencies which produce the fundamental, the octave and a fifth above that would be a simultaneous conception of whole notes, half notes, and half note triplets, in a bar of common time (though it should now be clear that four beats to the bar is one of many options), as we saw at the top of figure 7.4.

There are of course many books that go into these relationships in much greater detail than is necessary here. To clarify a few more of these ratios however, suffice it to say that further up the harmonic series, the third harmonic, which vibrates at four times the fundamental frequency⁴⁸, produces a note two octaves higher (two times the first octave, which is itself two times the fundamental). In rhythm, we get a stream of notes four times as fast as the fundamental, which would be quarter notes in the previous conception and in figure 7.4.

The fourth harmonic, which vibrates at five times the fundamental gives the note that is approximately (in tempered tuning) a major third above this second octave. The equivalent rhythm, continuing in our standard notation example, would be quarter note quintuplets. The fifth harmonic would be six times the fundamental, a fifth above that second octave (an octave higher than second harmonic, which we remember is three times the fundamental). This would be in our example quarter note sextuplets (which, oddly or not is the same as quarter note triplets). The potential for confusion is sometimes higher in prosaic descriptions, and sometimes the other way around. As this example seems to follow the former condition, a summary table is in order; I would also strongly recommend visualization and aural training at the keyboard for the pitch examples and visualization and aural training using figure one for the rhythm examples.

⁴⁸ This system of nomenclature can also cause initial confusion. Nevertheless, it is the system in common usage.

Multiple of Fundamental	Frequency Name ⁴⁹	Approximate Intervallic Pitch Equivalent	Rhythmic Equivalent (in a Bar of Common Time)	Ratio to the Fundamental Equivalent in the Same Octave
1	Fundamental	Fundamental	Whole Note (One)	1:1
2	First Harmonic	First Octave	Half Notes (Two)	2:1
3	Second Harmonic	Twelfth or Perfect Fifth Above First Octave	Half Note Triplets (Three)	3:2
4	Third Harmonic	Second Octave	Quarter Notes (Four)	4:1
5	Fourth Harmonic	Major Third Above Second Octave	Quarter Note Quintuplets (Five)	5:4
6	Fifth Harmonic	Perfect Fifth Above Second Octave	Quarter Note Sextuplets (Six)	6:4 (3:2)
7	Sixth Harmonic	Minor Seventh Above Second Octave	Quarter Note Septuplets	7:4
8	Seventh Harmonic	Third Octave	Eighth Notes	8:1
9	Eighth Harmonic	Major Ninth Above Third Octave	Eighth Note Nonuplets or Triplets of Half Note Triplets	9:8

Table 12. Harmonic Nomenclature, Pitch and Rhythmic Relationships

I have now taken the perhaps perilous course of giving the reader homework. Nevertheless, as experiential learning is 'fundamental' to this study, it is also fundamental to the transmission of the perspective under scrutiny.

⁴⁹ Suffice it to say that we start counting with the fundamental, but that the harmonics are counted starting at double the fundamental, hence their number is always one less than the total number the ratio has been applied, e.g. the fundamental=1x, first harmonic=2x, etc.

Pitch and Rhythm are Analogous

Music scholars may find some difficulty in finding equivalence in pitch and rhythm in this way. Although some ((Jay; Toro 1995) come close to claiming there are in fact connections between these cognitively separate worlds of frequency perception, I am not advocating such a position here. I *do*, however suggest a strong, functional analogy, in that a world of octaves is a comparatively sparse world, whether in pitch or rhythm. Such a world cannot really be said to have harmony, nor to require simultaneity of perception and awareness.

Harmonic Rhythm: Toro's Approach

For the development of an experiential perspective to go along with these concepts, I will now look at the core of Toro's method. Broadly speaking, Toro approaches the development of single player multi-dimensionality from at least two perspectives: one in his first instructional book, *For Your Hands Only*, and another in his treatise on odd metres, *The Odd in You*. *For Your Hands Only* is about hand technique but concentrates throughout on the development of independent⁵⁰ motions between the two hands (or any other combination of limbs or digits to which one may wish to apply it). That approach is covered in more detail in the section, "Linear Modalities" (page 153).

The concepts reviewed above and the discussion of a harmonic conception of rhythm relate more to the approach taken by *The Odd in You*. This is the approach in mind in the following discussion. In order to create an experience of the harmonic series in the rhythmic realm of frequency, a musician would practice hearing and playing these frequencies on their lap, on a table, or on an instrument of choice. First, a long *one*; then, in the same space of time, one would play and/or say, '*one, two,*' for as many repetitions as it takes to be thoroughly comfortable (perhaps even on the edge of boredom, or when the mind starts to wander but the rhythm does not), then, '*one, two, three,*' and so on. It would be a good idea to keep the *one* with the feet and also an external timing device, depending on the practitioner's experience with keeping steady time.

This is preliminary practice and should be mastered first. However, the idea is not to only hear these separate metres in sequence, but simultaneously. The first exercise in *The Odd in You* is to keep *two* and *three* with the feet and play the other metres, *one* to *nine*, with the hands. As suggested in the previous paragraph, this is a goal that needs to be broken down into a number of intermediate steps according to one's experience, enthusiasm and aptitude. For example, *two* and *three* can be played with the hands for a good while first. Many musicians know how to do this already, and a bit of practice while concentrating alternately on each metre, counting each out loud, etc., may be all that

⁵⁰ Some musicians, including Toro, think this term is misleading, preferring others such as interdependence.

is needed. Even in such a case, however, a short discussion of the relationship between these two and about linear versus harmonic conceptions of that relationship is in order.

Two and Three: The Foundation

Two and *three* have a unique relationship that can be easily derived and worked with in a linear way. The easiest approach is to count in *three*, as this way the second articulation of the *two* metre occurs with the upbeat/offbeat/'and' of beat two in the *three* metre.

Linear Count	One	And	Two	And	Three	and
Right Hand	One		Two		Three	
Left Hand	One			Two		

Figure 7. *Two* from *Three*.



Audio Example 11. *Two* from *Three* (CD Track 11).

Thus, we say, '*One, two and three...*' Some people find a mnemonic phrase helpful such as, 'Pass the butter,' or 'Red beans and rice.' Indeed these devices, though less than rhythmically explicit, can be helpful to jog the memory concerning the 'melody,' or rhythmic interplay between the two parts, especially in more difficult relationships when counting becomes tedious.

A second approach is to count in *two*; in this case each beat must be divided into triplets, and the relationship to the beat is thus a bit more complex, landing on each of the triplet partials in leapfrog fashion instead of on a downbeat or upbeat.

Linear Count	One	Trip	let	Two	Trip	let
Right Hand	One		Two		Three	
Left Hand	One			Two		

Figure 8. *Three* from *Two*.



Audio Example 12. *Three* from *Two* (CD Track 12).

Here we would count, '*One, -, let, two, trip, -,*' maintaining of course the spaces for the missing syllables. Alternatively, we could rather count all and accent or tap those syllables. Though more involved than the previous approach counted in *three*, still it is not extremely difficult to grasp with a

bit of practice. The reader will note that I previously dismissed this approach as overly complex, but it does have its place. Thinking linearly and deriving the polymetric relationship of *two* and *three* is a very helpful way to get started with this mode of dual metric perception, but as suggested in the hands-on instructions above, the goal is to move past hearing two metres as components of the same line, and hearing them as two co-existing lines, occupying the same temporal space (i.e., they are the same length). As we shall see later, Toro's method makes use of the aforementioned linear relationship—the dotted note—as a cornerstone for the development of rhythmic perspective.

Two and *three* are near the foundation of the harmonic perspective of rhythm (or, as in Figure 6, at the top); in addition, their relationship is uniquely simple, as it requires the beat to be divided only in half. Other metric relationships are more complicated, with finer divisions. It is a bit like cutting a cake into threes: It is do-able, but what about fives? We do not usually do that (not very accurately), or, we use another measuring stick. Have you ever seen an evenly sliced pizza in any number but eight? What is more, this example is out of time and visual. Music is not. We can take our time to slice our pizza or tart into seven equal pieces if we want to. Notation can make rhythm, including complex relationships, more visual, and that can be helpful; but if we get into *five* with *seven* or even *five* with *three*, the notation will not tell us how the two rhythms sound together without some quick and complex calculations, as previously described. And, though the notation can provide a helpful visual approximation of the relationships involved, it must first be prepared, preferably with a ruler and calculator to spatially represent the correct ratios, or with the aid of computerized score writing software.

But, we *can* count to *five* or *seven*, and conceive of them aurally. We then make the articulations even—that is, we entrain them as a constant stream—but filling the space of *one*. This may take a few tries, but it is much easier than the counting and simultaneous re-grouping of subdivisions. In this way, we use an internal measuring stick (entrainment to a metre (London 2004)) that the body/mind system is adept at, much more so than the counting and regrouping exercise. But, to be able to let two or more metres happen in the body at the same time, familiarity with the preceding and following *two* and *three* exercises is essential.

The Building: Adding a Third Metric Reference

To continue outlining the first exercise in *The Odd in You*, we would next play the *two* and *three* with our feet, then add the *two* with the hands together and then separated (one hand playing count one, the other count two). Next the hands switch to the *three*, i.e., they play with the other foot. From here it gets a bit more difficult, as the hands play *four* (double the *two*), *six* (double the *three*)

and, with only the *one* and its offbeat for reference, *five* and *seven*. *Eight* and *nine* tend to come easier, as they can be derived and felt as multiples of what is being played by the feet. To manipulate the whole sequence might take several weeks or months of practice but with some work it is achievable. Playing through these different time values in an unbroken sequence produces in me a feeling of open, multi-dimensionality; each change creates a feeling akin to that triggered by a psychologically abrupt change of scene in a movie, an abrupt change of key in music, or perhaps, the change from sleeping to waking consciousness and back again. The hands on *two* and then *three* with the feet present mild coordination challenges but from *four* up the challenge becomes perceptual and dimensional.



Audio Example 13. *The Odd in You, First Exercise* (CD Track 13).

Below is part of a conversation I had with Toro which sheds some light on the powerful feelings alluded to above when hearing and playing multiple metric references and/or switching from one rhythmic perspective to another. Here we were dealing with superimposition of the dotted note, and comparing the feeling to that generated by spiritual transcendence:

And you give yourself. And that becomes a religious experience. And that's why the act of being in rhythm becomes a religious experience. You see? You just described what a religious experience is. It's the act of letting go to rhythm. And it takes you...and you're lost...because there's no...now. There's just this...or, you could say there is this now, that is carrying you, every second. But you have no control. And so, what I do is both. I start playing...I just had a religious experience. I'm doing this (hip hop groove) ...I go (dotted note)...I'm in! I'm there... (still on dotted note, looks at hi hat with old tempo, plays more, then goes back to it). You see? I'm in two different worlds. And I go to that, and all of the sudden, this (ride cymbal with new, dotted, tempo) ...seems to be in slow motion. And I...now I hear this (hi hat) ...and this is a triplet. A clear triplet. And the whole gravity changes. See? The gravity's different. You're there (waves toward ride cymbal side), you're connected. You're in a different world. But consciously! And this is better than being unconscious. And this is my point. That's my educational point. How to be connected to this heavy stuff...how to connect...and yet be...conscious of it. The Hindus have this stuff. But someone else has to keep time. Here, you're keeping time yourself. (Toro 2012)

Harmonic Rhythm in Practice: A Few Examples

Thus *two* and *three*, played together, are accessible both linearly and harmonically; they form the foundation and introduction to the harmonic pyramid, and to the development of harmonic perception. Perhaps this is why the *two/three* complex can be found at the base of AT/Musics the world

over (Toro 1995). As partial proof of the veracity of this rather bold statement, we can turn to the literature supporting this point of view *vis-a-vis* the African repertoire.

In a recent article for Music Theory Online, James Burns presents six rhythmic archetypes and presents numerous examples from Africa and its Diaspora (Zimbabwe, Haiti, Cuba, Ghana, Benin, Congo, Mande Djembe and Bala) for each one, showing how it is used in the pieces in question. He concludes that his presentation, “forcefully demonstrates the presence of a deep-structural grammar, which can generate countless surface variations wherever Africans get together to make music.” (Burns 2010, 89) All of his archetypes but two (one using all the offbeats, or 'UPS', as he calls them, and the other creating uneven phrases stressing three out of four main beats) are direct manifestations of the three and two harmonic combination at various levels of the beat hierarchy. All are in a primarily ternary feel. Novotney makes a strong case that the *three* and *two* relationship is the generative foundation of West African ternary timelines. (Novotney 1998) Peñalosa argues, in a fashion similar to the reasoning presented in this thesis, that this *three* and *two* foundation extends to binary pieces as well, by means of a quantized *three*. (Peñalosa and Greenwood 2009)

Kubik gives six general concepts he applies to all African music, the first three are:

Concept 1—The overall presence of a mental background pulsation consisting of equal spaced pulse units elapsing ad infinitum and often at enormous speed⁵¹. These so called elementary pulses...function as a basic orientation screen. They are two or three times faster than the beat, or gross pulse, which is the next level of reference.

Concept 2—Musical form is organized so that patterns and themes cover recurring entities of a regular number of these elementary pulses, usually 8, 12, 16, 24, or their multiples, more rarely 9, 18, or 27 units. These are the so called cycles and the numbers we call form or cycle numbers.

Concept 3—Many of the form or cycle numbers can be divided or split in more than one way, thus allowing for the simultaneous combination of contradictory metrical units. For example, the number 12 which is the most important form number in African music, can be divided by 2, 3, 4, and 6. (Kubik 2010, 42)

Thus, he is outlining the conditions—primarily in a ternary base of 12 pulsations—through which 'contradictory metrical units' are derived. To the above can be added the previously cited observations of Chernoff and Jones as to the consistent multi-dimensional nature of African music, based in *twos* and *threes*.

⁵¹ Polak and Gerischer, however, among others, argue that these pulse units are not always equally spaced. This subject will be taken up in the discussion of rhythmic 'feel'. (Polak 2010; Gerischer 2006)

It should be now fairly clear that this *two* and *three* foundational principle is indeed operating in at least a wide range of African Diaspora repertoire. Bold, all-inclusive statements, i.e., that *all* ethnic music is based on a simultaneous *two:three* foundation, would be difficult to maintain with scholarly rigour; it is left to the reader in his or her own experience to make or refrain from such judgments. However, to further assist the development of this perceptually and experientially based point of view, we must consider two other rhythmic structures: Binary metres and linear repertoire such as one finds in Indian rhythmic practice.

Binary Structure and the Proximate *Three*

First, it will be noticed that all the examples cited above were in ternary-based metres. That is, the main beats were divided primarily into threes. The *two* and *three* foundational relationship is clear and easy to derive in such a base. Two beats of triplets, or six subdivisions, with every other subdivision articulated, gives *three* against those two main beats. This can be seen in various guises in the previous examples of Burns, Novotney, Peñalosa and Kubik, among many others. Alternatively, in a metre of three, as is common in Spanish *Flamenco* music, the inverse relationship exists, where the *two* is easily derived by halving the three 'main' beats.⁵²

But what about music that is clearly in a binary metre with mainly binary subdivisions of the beats? In this regard, Toro is in agreement with Peñalosa and others that the near ubiquitous figure rendered by three subdivisions, three subdivisions, and then two subdivisions, shown here,



Figure 9. The Binary Three Correlate.



Audio Example 14. The Binary *Three* Correlate (CD Track 14).

is a sort of binary substitution for the *three* component of the harmonic foundation (Toro 2012b). This figure is found not only in African Diaspora folk and popular music, but is quite common in Indian, middle eastern and other musics as well. In fact, given its modern dispersion by popular

⁵² It should be clear by now that, depending on the aesthetic predilections of the piece or style in question, there need not be a 'main' beat or metre, but that several can co-exist and take perceptual predominance in turns according to the performance, the soloist, the dance, and of course, the listeners' awareness.

styles of dance music, from Michael Jackson to Hip-Hop, House, and Bollywood, it would be a difficult but worthy task to assess the dispersion of this figure through the world's musical traditions before the advent of mass media, and whether the phenomena does indeed represent some kind of dispersion, or, more to Toro's estimation, a parallel genesis based on the naturalness of the relationship it represents⁵³

In any case, as has been documented by Peñalosa (Peñalosa and Greenwood 2009) Acquista (Acquista 2009) and described to me by Toro, the aforementioned figure, also known as *tresillo cubano*, 'mambo bass' (Toro 1993b) or just *tresillo* (Mauleón 2011, 1999) can be shown quite clearly, from an African Diaspora perspective, to relate to the ternary relationships described previously. Any suggestion of a chronological relationship indicating a parent/child or evolutionary ordering is, to me, less clear cut. This is a relationship that was shown to me back around 1989 or 1990 by Yoruba *Dundun* ('talking drum' of the Yoruba people of Nigeria) master Francis Awe. Although the *tresillo* rhythm is common in many parts of the globe, its use in the African context, where simultaneous multiple metric references are the rule rather than the exception, suggests its function as a proximate *three* metre quite clearly, as explained below.

The Proximate Three: Clarity from Africa

To begin with, a review of a few basic African rhythmic concepts will be helpful. One of the most common organizational, foundational, or timeline patterns (Novotney 1998; Hernandez 2000; Peñalosa and Greenwood 2009; Kubik 2010; Locke 1998; Arom et al. 2004; Locke 2010; Burns 2010; Agawu 1995; Nketia 1974; Chernoff 1981, et. al.) is shown below:



Figure 10. Ternary 'Standard Pattern' or 'Key Pattern'.



Audio Example 15. The Standard Pattern (CD Track 15).

⁵³ As alluded to elsewhere, Toro is interested in Jung's theory of the collective unconscious, as well as Joseph Campbell's concept of the monomyth, both ideas based on the underlying assumption that humans are predisposed to certain universal attributes of mind; this is as opposed to personal attributes, which are based on an individual's experience. Thus, patterns of behaviour, myth, creative archetypes, dreams and such allegedly show similar themes across the world.

Written in this way, it is perhaps clear that it is comprised of the *three* metre derived previously by articulating every other ternary subdivision (there are two *threes* in succession, to make *six*). In this case, however, the first three are 'on' the beat, that is, they line up with the *one*, and the last four are offbeat, in relation to the *three* metre (again, there are two in a row, *six* altogether). Seen in this way, it is perhaps clearer to hear them as, 'on – on – on off – off – off – off (on),' such as this:

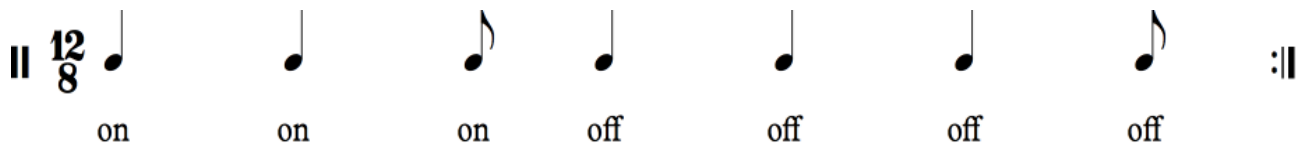


Figure 11. Ternary Standard Pattern from *Six*.



Audio Example 16. The Standard Pattern from *Six* (CD Track 16).

But now we must consider the *two* component, essentially built into the 12/8 metric format; it is the reason 12/8 is much preferable to 6/4, which would have been acceptable in the previous graphic. 12/8 implies the metre of *four*, subdivided as triplets. When these triplets are articulated in groups of two (or every other triplet, as above) we get the naturally occurring *two/three* cross-rhythm (Peñalosa and Greenwood 2009; Novotney 1998), polyrhythm, or polymetre, twice in succession:



Figure 12. *Two and Three* in Compound Quadruple Time, or *Four and Six*.

We saw and counted the same in box notation in Figure 7 and Figure 8. So, our timeline pattern with the *four* metre looks like this:



Figure 13. Standard Pattern with *Four*.

And finally, the same thing, grouped in *four*, with all the subdivisions implied, which should be easier to read⁵⁴:



Figure 14. Standard Pattern with *Four* and Implied Subdivisions.



Audio Example 17. *Three* and *Two* to Standard Pattern with *Two* (CD Track 17).

Now, in 12/8, the *two/three* (*four/six*) relationship is inherent in the timeline structure. One component, the *three*, is in the timeline and the other, the *two*, in the beat structure. In practice, these two metres and derivative patterns using only some of the articulations, on and off the beat, and/or ornamenting their respective metre, will be distributed to various instrumental, vocal, and dance patterns. (Chernoff 1981; Agawu 1995; Burns 2010; Anku 1997; Locke 1998; Scherzinger 2010, et. al.) In this way the dual metric implication is always implied. Short of long term experience performing and dancing to this kind of music, common in most of sub-Saharan Africa, it is recommended to learn to play the aforementioned two rhythmic combinations, and then to keep the top line while alternating between *four* and *six* to the bar on the bottom, like this:



Figure 15. Standard Pattern with *Four* then *Six*.

Note that this is a simplified, 'bare bones,' version of an African polyrhythmic/polymetric experience, and even traditionally derived variations to these exercises are extensive. Nevertheless, the

⁵⁴ In certain applications, I prefer this type of notation, similar to that used by Billmeier and Keïta. (Billmeier and Keïta 2004) It not only helps the reader with subdivisions and rhythmic groupings, but is more accurate. In percussion music, strictly speaking, all note values are short and similar, thus the mixing of quarter notes, eighth notes and half notes for bell and drum strikes is less than correct but often employed as it is easier on the eye than a great number of small rests. The notation system used here partially avoids that circumstance though would also be a bit cumbersome for long orchestrations. It is best suited to writing ostinatos. The eighth notes here are also not accurate enough to represent a real performance, as compared to duration values from a live performance into a midi device, for example. This discussion will be taken up when we come to feel. Thus introduced I will use this system when appropriate.

basic concepts should now be sufficient for the discussion at hand. With this key pattern and its dual metric implications understood, we can now turn to the binary correlate.

As the previous timeline pattern is fundamentally multi-dimensional, its relationship to the binary correlate can be seen from different perspectives. If we consider the rhythmic *three* element above and its correlate, *tresillo*, then, instead of,



Figure 16. Three with Two/Four with Six in Ternary Structure

we have,



Figure 17. Three with Two/Four with Six, Binary Correlate.

which might look clearer as this:

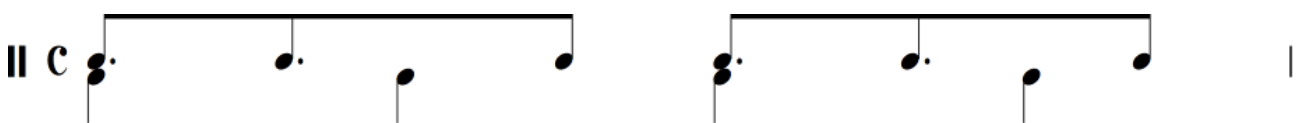


Figure 18. Binary Correlate as Dotted, Dotted, Non-Dotted.

A similar quantization of the standard pattern into common time then changes this,



Figure 19. Standard Pattern, Ternary.

into this:



Figure 20. Standard Pattern, Binary.

As mentioned, this very pattern *and its clear similarity to the ternary version* were first shown to me in Yoruba music lessons by Francis Awe. Both these patterns are common in that music. The binary version is also quite common in Congolese popular music such as *Rumba* and *Soukous*.

Moreover, in teaching I sometimes call this pattern a 'composite clave', as it contains all the elements that make up both the Rumba Clave and Son Clave, so central to the Cuban/Caribbean/'Salsa' rhythmic concept.

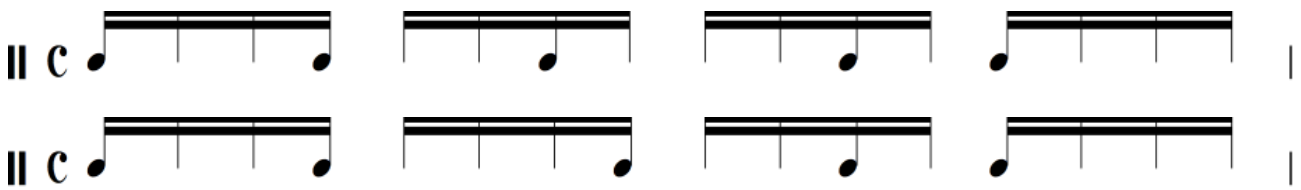


Figure 21. Son Clave (top). Rumba Clave (bottom).

Some scholars even suggest that all African Diaspora music is founded on the clave concept (Peñalosa and Greenwood 2009; Spiro and Ryan 2006), and the present discussion follows a similar line of thinking, though we are concerned here primarily with the implication of polymetre. I mention the clave concept to indicate once again how ubiquitous is the aforementioned rhythmic pattern—call it the binary standard pattern—especially if we consider the various claves as its relatives or derivatives.

Lest the discussion get overly theoretical, the experiential perspective is again in order, and thus, more suggested exercises.

First, changing from the ternary to binary feel and back again, while maintaining the same *four* background. I'll write it in common time with triplets to avoid changing time signatures:



Figure 22. Three and Two Ternary to Tresillo with Two Binary.



Audio Example 18. Three and Two, Ternary to Binary (CD Track 18).

Now, the same idea with the standard pattern:



Figure 23. Standard Pattern Ternary to Binary Feel.



Audio Example 19. Standard Pattern, Ternary to Binary (CD Track 19).

And finally, the binary version with the switch from *four* to 'six' underneath:

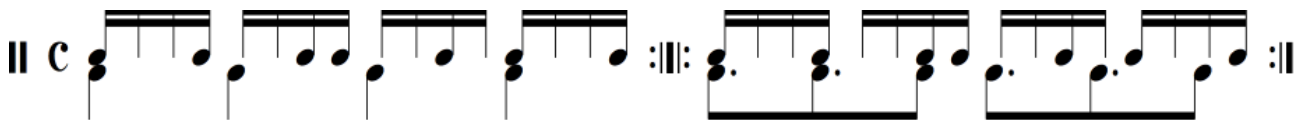


Figure 24. Binary Standard Pattern with *Four* and with Binary *Six* Correlate/*Tresillo*.



Audio Example 20. Binary Standard Pattern with *Four* and 'Six' (CD Track 20).

It essential to note, however, that these are not just exercises but actual foundational patterns found throughout the African Diaspora. It is the commonality and transmutability of these feels that constitutes the strongest evidence for the proposal that the *tresillo* pattern is actually a proximate *three*, maintaining the polymetric foundation even in rhythmic structures that appear to be outside a strict 12/8 interpretation.

The Proximate Three in Practice: Mandeng Jembe Repertoire

For a bit of evidence from traditional music in practice, I'll turn to the African genre most familiar to me and perhaps most well documented in terms of numbers of pieces, that of the Mandeng *Jembe*⁵⁵ and the accompanying *Dunun* bass drums with bells. I've chosen pieces randomly from the Billmeier and Keita book, *A Life for the Djembe* (Billmeier and Keita 2004), dismissing those in a ternary metre until I reached five⁵⁶.

⁵⁵ Note the usual spelling for this very popular, mortar or goblet shaped hand drum is *Djembe*. This spelling, however, is leftover as an attempt to use French sounds for our common Latin Alphabet characters to represent this African word. Having spent several years learning the *Jula* language (also spelled '*Dioula*', a dialect similar to *Malinke* and *Bambara*) with more consistent, less colonial, phonetic spellings, (outside of Ethiopia there are no traditional alphabets) I prefer to write the word as *Jembe* which sounds something like 'gem' and 'bay'. There are regional pronunciation variants as well, e.g., Polak, in his early writing, used *Jenbe*. (Polak 1998)

⁵⁶ I numbered the pieces from the index and used <http://www.random.org/sequences/> to generate my random sequence.

Djagbe

The first piece, *Djagbe*⁵⁷, known as *Madan* in Mali, is quite familiar to me as it was highly favoured among the friends who hosted and taught me in a stay near the town of Siguiri in upper Guinea in mid-2000. There are regional and personal variations with all of this music, but Keïta's version is quite similar to what I played in Guinea.

Here are the accompaniment patterns he shows for the *Jembe* and *Dunun* with bells:

The figure displays five staves of musical notation for the accompaniment of *Djagbe*. Each staff begins with a double bar line, a common time signature (C), and a repeat sign. The staves are labeled as follows:

- Jembe 1**: Shows four measures of rhythmic notation. The first measure has an 'x' on the first and third beats. The second measure has a dot on the second and fourth beats. The third measure has an 'x' on the first and third beats. The fourth measure has a dot on the second and fourth beats. The staff ends with a double bar line and repeat sign.
- Jembe 2**: Shows four measures of rhythmic notation. The first measure has a dot on the second and fourth beats. The second measure has an 'x' on the first and third beats. The third measure has a dot on the second and fourth beats. The fourth measure has an 'x' on the first and third beats. The staff ends with a double bar line and repeat sign.
- Bell and Sangban (middle)**: Shows four measures of rhythmic notation. The first measure has an 'x' on the first beat and a diamond on the second. The second measure has a diamond on the second and fourth beats. The third measure has a diamond on the second and fourth beats. The fourth measure has an 'x' on the first beat and a diamond on the second. The staff ends with a double bar line and repeat sign.
- Bell and Kenkeni (high)**: Shows four measures of rhythmic notation. The first measure has a diamond on the first and third beats. The second measure has a diamond on the second and fourth beats. The third measure has a diamond on the first and third beats. The fourth measure has a diamond on the second and fourth beats. The staff ends with a double bar line and repeat sign.
- Bell and Dununba (low)**: Shows four measures of rhythmic notation. The first measure has a diamond on the first and third beats. The second measure has a diamond on the second and fourth beats. The third measure has a diamond on the first and third beats. The fourth measure has a diamond on the second and fourth beats. The staff ends with a double bar line and repeat sign.

Figure 25. *Djagbe*.



Audio Example 21. *Djagbe* (CD Track 21).

The first two characteristics that stand out clearly with regard to the *tresillo* rhythm are the first *Jembe* part and the bells for the second two *Dunun* parts. The *Jembe* part, with or without the bass hit in the middle of beat three is ubiquitous in this repertoire; it is usually the second accompaniment given in binary pieces, with the first being often, but not always, something more unique to the piece in question. It is clear that it outlines the *tresillo* rhythm with the first two slaps and the first open tone, in each pair of beats (it repeats within the cycle, as does the *tresillo*), as well as the contrasting *four* beat (two for each half /each *tresillo*). This alone presents a clear reference to the hypothesized dichotomy of metres, and as I mentioned, this part is common in most of the binary pieces.

⁵⁷ I'll retain Keïta and Billmeier's 'Dj' spelling as this is a less common word than *jembe/djembe*, and a proper noun used by a cultural insider thus.

Tresillo as Three: From Two Possibilities to Eight

To follow Toro's point of view further, however, the concept gets a bit more complex. According to him, the *three* pulse has only two options, the on-beats of *three* and the offbeats. With the correlate that I am referring to as *tresillo*, however, there are not three, but eight possibilities, one for each of the subdivisions used. According to Toro, the pool of these eight possibilities is the source of all rhythms in this African, binary feel. He goes so far as to say that it is the source of anything you or I or anyone else will ever play. I choose not to speculate with the same degree of confidence, but it does point to the idea that any phrase, within a given matrix of minimum pulsation (here referred to as subdivision), will be made up of those pulsations in groups of twos and threes. With twos and threes, any other combination can be derived.⁵⁸ (Toro 2012b, 2014a) With this point noted, let us still consider how these West African examples compare to the eight possibilities.

Figure 26. Eight *Tresillo* Permutations.



Audio Example 22. *Tresillo* Permutations with and without Original Downbeat Reference (CD Track 22).

⁵⁸ My initial reaction was, “What about one?” But two articulations, or 'ones', in a row is really two. In any case, the point seems too pedantic even for this rather detailed discussion. Toro's reaction to my question seemed to indicate a similar point of view.

I have used an 'x' here to indicate the downbeat/'one' of the original pattern, and derived the others by shifting the whole sequence one subdivision to the right, through the first two beats, the length of the pattern⁵⁹. We can now examine some of the other accompaniment parts to *Djagbe* against these archetypes.

Quintillo

Along with the first *Jembe* accompaniment part, I mentioned that the bells for the second two *Dunun* parts clearly state the *tresillo* rhythm.



Figure 27 Bells for *Djagbe Kenkeni* and *Dununba*.

This pattern is also ubiquitous in the Mandeng repertoire represented here as well as in much of the wider African Diaspora; it even has its own name, in Spanish, in colloquial Caribbean music discussions: *quintillo*. This means, 'quintuplet,' but, as with the *tresillo* designation, refers not to an actual, evenly spaced quintuplet. It refers in this case to the rhythm repeated in the first line above, and in the first half of the second line⁶⁰. (Mauleón 2011, 1999; “Merengue Music” 2014; Acquista 2009)

Toro suggests that it does indeed have a relationship to a literal quintuplet, but we will come to that in another discussion. For now, note that besides stating and therefore implying the *tresillo*, this pattern is also comprised of the normal *tresillo* and the permutation numbered '3' above. We will see in this short examination of binary Mandeng *Dunun* repertoire, as I have gathered over many years playing the style, that this bell pattern is a foundational pattern; not only is it played in some guise in most of the pieces, it also seems to generate the various *dunun* patterns with which it is paired. That is, it is commonly played with different drum patterns that articulate different combinations of the basic *quintillo* strokes. Two of these can be seen in the *Djagbe kenkeni* and *dununba* parts which underlie the bell patterns above (**Figure 27**). The *quintillo* seems to be the backbone or the foundation from which many different *dunun* rhythms are built. This lends partial evidence to Toro's idea that these *tresillo* permutations (of which two are represented in *quintillo*) generate 'all' the repertoire.

⁵⁹ For the sound file, I recorded the permutations both with and without the original reference downbeat distinguished by a different tone. With it, it is interesting to try to hear/imagine the original motif, even as it shifts its position within the rhythmic cycle. Without it, we hear the various permutations without bias from the original.

⁶⁰ The second line is also known as *baqueteo*. (Mauleón 1999, 2011)

Cascara/Pallitos

And what of the first *dunun* part? This is the *sangban*, considered by Keïta to be the heartbeat of a rhythm composed in this style. (Billmeier and Keïta 2004, 32) Here are the bell and drum parts again:



Figure 28. *Djagbe Sangban with Cascara-like Bell.*

Interestingly—and uncharacteristic in this repertoire—the bell part is the same pattern known as '*pallitos*' in Afro-Cuban *rumba* (played by two sticks) and as '*cascara*' as played by the timbale player in a salsa band. (Malabe and Weiner 1990; Mauleón 2011; Spiro and Ryan 2006; Hernandez 2000; Peñalosa and Greenwood 2009; Goines and Ameen 1993) When I played the *Djagbe* rhythm in rural upper Guinea, we did not normally use a bell with this drum part, so I cannot say for certain if this is an old, traditional part or if perhaps it has been adapted after Caribbean music made its way 'back' to Africa through recordings from the middle of the 20th century on. Keïta is usually sincere in his attempt to preserve his culture's rhythms as they were taught to him during his youth spent in upper Guinea. Fara Tolno, in his recorded collection of Mandeng *Jembe* and *Dunun* accompaniments gives a slightly different interpretation for the drum rhythm but with the normal *quintillo* bell pattern⁶¹. (Tolno 2009)

Binary Clave: Contrary Terminologies

But what of its relationship to the *tresillo* permutations? Trying to make the *cascara* pattern out of two interlocked *tresillo* patterns is not possible because it is not the same on each half. The possibilities inherent in mixing and matching more than two permutations seem, to me at least, to scale to such number that any meaningful relationship would be difficult to prove⁶². So, I decided to look at the drum part first. Unlike its fellow accompaniment parts, this pattern needs the entire cycle to be completed. It is not made of half a cycle that is repeated. This fact, along with the use of the *cas-*

⁶¹ Keïta on the roll on the bells: “The bells bring another range of tonality into the rhythm, and they fill the space between the beats on the drum. The voice of the bell plays a very important part in Malinke rhythms. It guides the drummer and listener, and brings a rhythmic refinement to the ensemble of drum voices. The musician may freely vary the bell voices. However, bells are not played in all all regions, and, to my knowledge, there are only two areas where all three bass drums have bells.” (Billmeier and Keïta 2004, 33)

⁶² But it can be made from two *quintillos*:

Cascara from Two Quintillos.

cara-like bell pattern, makes one think of *clave*. As we saw above, *clave*, in its ternary form consists of roughly half the cycle articulating the on-beat *three* metre (or *three* pulse cycle or *three* cross-rhythm) and the other half articulating the offbeat *three* metre. In common use among musicians trying to make sense of *clave* based music in binary styles such as salsa,⁶³ however, the thinking is a bit different. When trying to decide which way a particular melody or percussion part fits with *clave*, for example, people often speak of the *three* side, which is the *tresillo* rhythm⁶⁴ as being the offbeat side of *clave*, and the *two* side as being the on-beat side. That is, an accompanying rhythm such as this common piano *montuno* (a *montuno* is simply a repeated pattern, here in d minor),



Figure 29. 2/3 Son Clave with Piano Montuno Written as One Bar.

is unequivocally heard in '2/3' *clave*, as shown on top, even though there is only one rhythmic coincidence per half (or 'side,' as in, 'the 2 side,' and, 'the 3 side'). Anyone familiar with Latin music in written form has probably seen it like this:



Figure 30. 2/3 Son Clave with Piano Montuno, Half Time/Two Bars.

In this case, the 'on-beat/offbeat' designation is clearer: on the '2 side', the *montuno* plays on beats one and two and everything else, including all the notes on the '3 side' are in between the main beats, i.e., the ones you would count with the numbers, '1, 2, 3, 4,' in one bar. This type of notation seems to be easier to read for some players, and keeps the two sides of *clave* clearly in two bars—

⁶³ 'Salsa' is not one style but a generic term representing many popular dance music styles of mostly Caribbean origin. It was originally coined for marketing purposes. (Gast 1972)

⁶⁴ In son *clave*, that is. In rumba *clave*, as we have seen, the third note is displaced by one subdivision.

clave and clave music is often thought of as being in two bar phrases. However, the 'beats' that are actually danced to and otherwise felt as the primary grouping, are those indicated by the one bar clave phrase, with sixteenth note subdivisions of those beats, as used elsewhere in this discussion. This is consistent with the idea of *tresillo* being a *three* correlate against two main beats. There are four main binary beats (not eight) and six ternary or *tresillo* beats, to a measure, or time cycle unit. It is also the preferred convention for the notation of this music in Cuba⁶⁵. (Cruz et al. 2004)

All this seems to work well enough in practice. However, there is an inconsistency in our line of thinking: In a ternary feel, the first (in common practice) or '3' side of clave is on the *three* pulse metre and the following or '2' side is off of the *three* metre. In binary interpretation, these designations are reversed, or rather, they are called, 'on' and 'off' in relation to the predominant metre, which is binary, and the result is this reversal of designations between the binary and ternary interpretations. In other words, in common Latin (Caribbean, USA) music parlance, the '3' side of the clave emphasizes the offbeats and the '2' side emphasizes the on-beats. (Mauleón 1999) Two new points of view present themselves which will hopefully make for a more consistent picture.

***Tresillo* Permutations and Polarity**

In the *tresillo* and permutations view, the two halves of clave would correspond with two permutations of *tresillo*. Looking at the *Djagbe sangban* pattern, and even at its cascara-like bell pattern, this explanation seems to fit:



Figure 31. *Djagbe Sangban*.

The first half of the drum pattern (bottom line) corresponds to permutation 6 from figure 7.24 above and the second half to permutation 3. I wondered if the eight permutations could each have a primary relationship to either the on-beat or offbeat ternary form? On its own, this potential relationship is only mildly interesting. What is important is whether it will help to establish the basis of the polarity—what is usually referred to as clave—which seems to exist in African Diaspora music, and

⁶⁵ Another option is to write in 2/2 or 'cut' time, indicating that there are two beats per bar, with subdivisions of four written as eighth notes. This makes sense, as the note values are consistent with common usage, but there are two beats to a bar, or four to a two-bar, clave-length phrase; this is Toro's usual method, but he ends up referring to those same four subdivisional units (written in eighths) as 'sixteenths,' and other such mixed terminology. In the end, I compromised between 'sense' and common usage.

tie that concept to the poly-metric foundation under discussion. In order to compare the *tresillo* permutations to their correlates in *three*, and in *two*, they are shown below in graphic and box form.

The figure displays eight staves of musical notation, numbered 1 through 8 on the left. Each staff is in 2/4 time and contains four measures of music. The notation includes eighth notes, quarter notes, and rests. Brackets under groups of three notes indicate triplets. Some notes are marked with an 'x' to denote specific rhythmic values. The patterns represent different permutations of the *tresillo* rhythm.

Figure 32: Each *Tresillo* Permutation with *Three* and *Two*, On Beat and Off Beat.

<i>Three metre</i>	O n e	2	3	4	A n d	6	7	8	T w o	10	11	12	A n d	14	15	16	T h r e e	18	19	20	A n d	22	23	24	notes
Onbeat <i>three</i>	X								X								X								
Offbeat <i>three</i>					X								X								X				
<i>Tresillo</i> 1	X									X										X					'3 side' model
<i>Tresillo</i> 2				X									X									X			
<i>Tresillo</i> 3	X						X									X									'2 side'; Djagbe
<i>Tresillo</i> 4				X						X															
<i>Tresillo</i> 5							X						X									X			'2 side'; 'Displaced <i>Tresillo</i> ' (Peñalosa)
<i>Tresillo</i> 6	X								X							X									'3 side'; Djagbe
<i>Tresillo</i> 7				X									X												
<i>Tresillo</i> 8							X									X						X			
Offbeat <i>two</i>							X																		
Onbeat two	X												X												
(off- beat <i>four</i>)				X						X						X						X			
<i>Two metre</i>	O n e			'e'			A n d			'a'			T w o			'e'				A n d		'a'			

Figure 33. As Above, in Box Notation.

So far, what seems clear is that anything representing the '3 side,' or on-beat *three*, has an articulation that falls just after the second articulation of the pure *three* (the 'a', or last sixteenth of one); this spot is important enough to also have its own name in Spanish: *Bombo*. Furthermore, the patterns

that represent the '2 side,' and possibly the offbeat three metre, land squarely on two sequential instances of the *two* metre, *within the same cycle*; that is, not on the end of one cycle and the beginning of the next, as we see with the basic *tresillo*. It also seems clear, however, that more empirical evidence is in order, especially if it will clarify the polarity of the remaining four *tresillo* permutations.

Kuku

The next binary *Jembe* rhythm on my randomized list is *Kuku*. This form of *Kuku* is an adaptation from the original as played by the Manian people of Guinea and Côte d'Ivoire; the original was played on three *Jembe* drums only, as it is on Keïta's recording Wasolon. (Billmeier and Keïta 2004, 150; Mamady Keïta & Sewa Kan 1989) I played this rhythm many times in Odiénne, western Côte d'Ivoire, near to where it originates, and in Korhogo, in north central Côte d'Ivoire. In both those settings it was played with *dunun*, close to the form notated below, as it appears in Keïta and Billmeier. It is possible I played it in Mali or Guinea as well, as it is a very popular rhythm.

The figure shows five staves of musical notation for the *Kuku* rhythm in common time (C). Each staff begins with a double bar line and a common time signature. The notation includes various rhythmic patterns such as eighth notes, quarter notes, and rests, with some notes marked with an 'x' to indicate specific articulation. The first four staves (Jembe 1, Jembe 2, Bell and Sangban, and Bell and Kenkeni) end with a double bar line, a slash, and another double bar line. The fifth staff (Bell and Dununba) ends with a double bar line and a repeat sign.

Figure 34. *Kuku*.



Audio Example 23. *Kuku* (CD Track 23).

The first *Jembe* part in *Kuku* is also a fairly common accompaniment and gives a strong feeling of the offbeat; this is articulated alternately with doubled tones and single slaps, thus adding a bit of question and answer dimensionality, rather than one simple offbeat note. Bass drum hits on beats one and three ground the part and articulate the other side, the downbeat, with another sound. The second *Jembe* accompaniment is characteristic to *Kuku*, but also played with two drums in Calypso

music. I was also taught the same rhythm many years ago by Congolese traditional musicians as part of their music, probably of the Kikongo people. Here again, I do not know if this was somehow 'borrowed' in antiquity across the relatively large swath of mostly dense forest that separates the Manian of present day Eastern Guinea with the Kikongo of the central Africa, or if the exchange came about much later, through recordings or personal observation. It seems remotely feasible it was co-created, as the underlying components are very common across Africa. I will not speculate any further than that. The part itself, along with the *Kenkeni* in this orchestration, grounds the whole rhythm very strongly by playing and doubling every on-beat. Around those tones, however, we find the *tresillo* rhythm (minus the first note) articulated with slaps. This suggests a very strong on-beat *two* and *tresillo/three* in one part. This is perhaps due to its original use without *Dunun* (bass drum) accompaniment. The *Sangban* plays *quintillo* and *tresillo* on bell and drum, with the *bombo* spot differentiated by muffled strikes (still highly audible but with a higher pitch).

The lowest drum, the *Dununba*, uses a combination of *quintillo* and straight eighth notes on the bell. The drum rhythm likewise articulates the every other *bombo* and the two beats in between play straight eighths or nothing at all. This seems to be the key part in this discussion as it is only here that the rhythmic polarity is clear. The other parts are, to use Mauleón's term, 'clave neutral.' (Mauleón 1999, 10; Peñalosa and Greenwood 2009, 172) Here, however, rather than supporting our nascent thesis that each half of the polarity must relate to alternate permutations of the *tresillo* rhythm, we see *tresillo* and *non-tresillo*, or consecutive on and offbeats in two. This seems to disagree slightly with Penalosa's 'displaced *tresillo*' model as well (Peñalosa and Greenwood 2009), but agrees with the aforementioned observation that the 2 side of clave polarity matches with two successive articulations of the *two* metre, i.e., '1 and,' 'and 2,' or '2 and,' in the same cycle of two beats; that is, *not*, 'and 1,' as in the normal *tresillo* rhythm.

Kassa

Next on the list is *Kassa*. *Kassa* is farming rhythm of the Malinke people, played to encourage group cultivation or harvesting work. I participated many times in these work parties as both a worker and musician when I lived in a small village in northwest Côte d'Ivoire. The feeling of group synchronization and the energizing effect of a strong groove was remarkable. I daresay it was more powerful for the multi-dimensional nature of the music, but that is opinion. Keïta and Billmeier's basic version is shown below.

Jembe 1

Jembe 2

Bell and Sangban (middle)

Bell and Kenkeni (high)

Bell and Dununba (low)

Figure 7.27. *Kassa*.



Audio Example 24. *Kassa* (CD Track 24).

This rhythm is less obvious in its clave polarity, but it led me to search for other clues. Rhythmically, the *sangban* is essentially the same as that seen in Keita's version of *Kuku*, but with the open and muffled tones reversed. It is of course the *tresillo* in pure form, with the *cinquillo* on bell. Note that each of these *sangban* patterns singles out the *bombo* note, though with opposite sounds; this note by itself seems key to suggesting the *tresillo*/*three* metric correlate. The *kenkeni* bell presents a modified *cinquillo*, not uncommon in this repertoire. It can also be seen as a displaced *cinquillo*, with the single strike that is normally on the downbeat now on the *bombo*. It still contains the *tresillo* figure, but the added notes in this permutation of the *cinquillo* allow for a different drum melody, emphasizing the downbeat of each half of the pattern with two strokes. These interlock with the other drum parts to make a composite melody which emphasizes simultaneously on-beats, offbeats (of *two*) and *tresillo* (*three*). This is typical in African and Diaspora percussion ensemble music: multiple parts that interlock *and* overlap. Either quality on its own is linear and one-dimensional.

Still, these patterns, though interesting, repeat in the second half of the bar and therefore present as 'clave-neutral.' What about the hypothetically necessary polarity, or clave? The *dununba* part does not repeat exactly in the second half but is not clear cut either. The *cinquillo* pattern does repeat on

the bell, with the drum playing in unison to different parts of that *cinquillo* bell. Now we see that the *cinquillo*, though clearly suggesting *tresillo*, might also contain the capacity to suggest either side of the polarity. Without reference to other subdivisions than those of the *cinquillo*, the drum articulates the downbeat and *bombo*, as the *tresillo*/on-beat *three* correlate is likely to do, in the first half, and in the second half, it leaves off the 'downbeat' (secondary downbeat; the reference is to beat three in the notation) and articulates the same two following notes as the first half, including the *bombo*. In this instance, without the downbeat, the 'and' of beat three suggests the *two* feeling, though there are not two articulations (on beat, offbeat or 'and' in *two*) in succession as noted with the previous two rhythms. I noticed that it seemed easier to play this rhythm together with a three-two clave pattern than the other way around, though three of the five clave strokes match in either orientation:

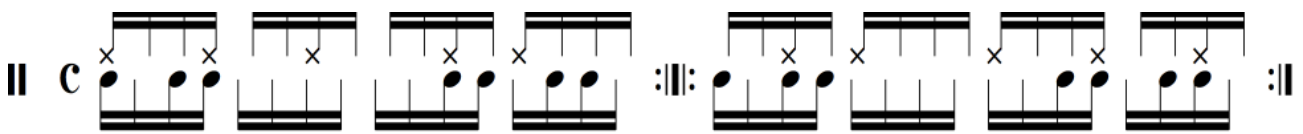


Figure 35. *Kassa Dununba* with 3/2 and 2/3 Clave.



Audio Example 25. *Kassa Dununba* with Claves (CD Track 25).

Still, this doesn't prove each side exhibits its polarity in a clear and unique fashion. It is playable with two-three clave and doesn't sound bad to my ears, just less 'together.' As the third note of the *tresillo* figure is on-beat in an 'and' position it seems to suggest 'two-ness' as well as to simply complete the 'three-ness' in *tresillo* fashion. It is interesting to note that this position (the third note of *tresillo*, which falls on the 'and' of beats two and four above, or on beat four in the two-bar rendition counted in eighth notes) as demonstrated in figure 7.32 above, is *not* the closest note in the binary quantization of the three metre. This note also has a Spanish name, *ponche*.⁶⁶ At the resolution presented by the 24 box analysis, we see that the *ponche* note, while falling right on the 'and' of two in the *two* metric conception, is actually two boxes from the three of *three*; The other *tresillo* posi-

⁶⁶ It is also commonly but less correctly referred to as *Tumbao*, probably because it is arguably the most notable sound from the common *Tumbao*, or repeated pattern played by the conga player in many Latin arrangements. I learned to refer to the, 'bombo-tumbao' figure of the conga, bass drum or bass player, but as Peñalosa shows this is more accurately known as 'bombo-ponche.' (Peñalosa and Greenwood 2009; Peñalosa and Greenwood 2010)

tions—downbeat and *bombo*—are on and one box off of the un-quantized three metre's first and second beats, respectively. A 'better' fit is actually permutation six—the first half of the Djagbe *sangban*—but it lacks the ambiguous possibility of the normal *tresillo* to suggest either the three side or the two side.

<i>Three metre</i>	O n e	2	3	4	A n d	6	7	8	T w o	1 0	1 1	1 2	A n d	1 4	1 5	1 6	T h r e e	1 8	1 9	2 0	A n d	2 2	2 3	2 4	notes
<i>Onbeat three</i>	X								X								X								
<i>Offbeat three</i>					X								X								X				
<i>Tresillo 1</i>	X				X				X				X				X								'3 side' model
<i>Tresillo 6</i>	X				X				X				X				X								'3 side'; Djagbe; Of all permutations, most precisely resembles the timing of the <i>three</i> metre, shown in pink.
<i>Offbeat two</i>						X							X							X					
<i>Onbeat two</i>	X												X												
<i>(offbeat four)</i>				X					X							X					X				
<i>Two metre</i>	O n e		' e '			A n d			' a '				T w o			' e '				A n d	' a '				

Figure 36. Timing Focus, *Tresillos 1 and 6*.

Here is another mini-hypothesis to consider: Emphasis on *ponche*, especially on one side of the rhythm, can suggest *two* even from the hypothetical *three*-like *tresillo* in its original position. From another point of view, the clave two-side/offbeat *three* side of *Djagbe*, or *tresillo* permutation 3, added to the normal *tresillo*, gives us *cinquillo*! Thus the *cinquillo* itself can refer to either dimension.



Figure 37. *Tresillo* and Its Permutation Gives *Cinquillo*.



Audio Example 26. Two *Tresillos* Make *Cinquillo* (CD Track 26).

Tresillo and its Permutations Together

Though it was not clear to me at the time, Toro pointed this out in one of our early lessons, without reference to *Djagbe*, but rather talking in a general way about West African rhythms (or, as noted above, 'all' rhythms). He demonstrated the two permutations above to make *quintillo* with his two hands and then played *tresillo* with his bass drum foot while adding, in succession, several other *tresillo* permutations with his hands, showing in a sense his original point and the one that we are examining here: that *tresillo* and its permutations stand for on-beat and offbeat three in a binary feel. (Toro 2012b) Being uneven, however, there are points of overlap instead of the steady alternation when playing the actual on-beat and offbeat *three* together. This complicates the matter and produces many interesting possibilities as well. Here are all those possibilities:

Figure 38. Basic *Tresillo* with its Permutations.



Audio Example 27. Basic *Tresillo* with Permutations, with and without Original Downbeat Reference (CD Track 27).

Of course, one could also combine them using each in turn as the static base, rendering 64 possibilities, assuming separate sound sources. The point here, however, is to show how some nearly align with the normal *tresillo*—our hypothetical *three* correlate—and some others mostly fall in the spaces that *tresillo* leaves open.

The *Jembe* Break and Other Observations

Though I have given this rhythm more attention than the others, there are still a few other observations brought out by its difficult nature regarding clave orientation, or polarity. The first is the break used to call the rhythm, end a dancer's solo, end a percussion solo, call a unison pre-composed group section, to end the rhythm, etc. This figure is also ubiquitous in the repertoire.



Figure 39. Binary *Jembe* Break.



Audio Example 28. *Jembe* Break (CD Track 28).

This figure is clearly in the three-two clave position; though the downbeat and *bombo* show up in both halves, the second half merely plays through the *bombo* with a strong and final slap phrase from the 'and' of beat three to beat four. The first half, interestingly, seems to use the same permutation six to demonstrate its 'three-ness', as does the identical first half of three-two *cascara*, as well as Fara Tolno's version of the *dununba* accompaniment to the rhythm *Aconcon*:

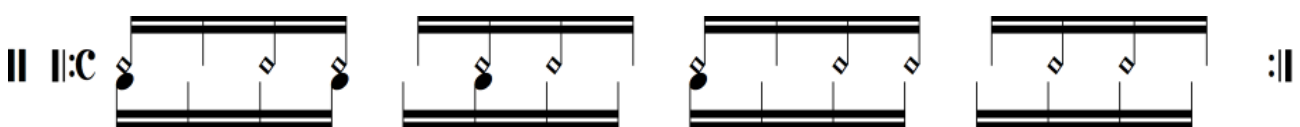


Figure 40. *Dununba* for *Aconcon*.

Since most of these binary *jembe* rhythms use this break or a facsimile such as,

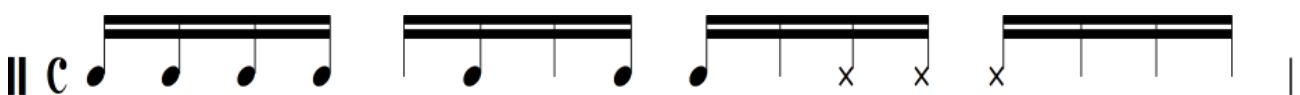


Figure 41. Binary *Jembe* Break 2.

I remembered a point made by Peñalosa that all folkloric rhythms begin on the three side of clave. Actually, he says that the three-two/two-three clave concept is not a factor, citing examples in his

notes of various Cubans and Africans saying that clave is a concept employed by westerners or outsiders to understand the music. But, he says that in folkloric music, the one/beginning/primary downbeat is always on the three side of the clave polarity. If the vocal part lines up with the two side, then the direct, insider interpretation is that the vocal just enters on the other side of the rhythmic structure. (Peñalosa and Greenwood 2009, 158) This agrees with the discussion of the *Jembe* break above. However, this, 'folklore always begins on the three side,' idea, assuming it is true and reliable, is merely a helpful pointer in this discussion, which has been about *how* this *three-ness* is manifested.

Finally on this rhythm, *Kassa*, it is interesting to note how the polarity is subtly indicated in the *jembe* parts themselves. Both accompaniments appear to be clave neutral, except for a lone bass note on beat four in the first accompaniment and on the 'and' of beat three in the second. I have heard, played and been taught both these parts in other rhythms; the second, as noted previously, is very common, and I've seen it with and without the bass note, never giving much thought to the strategic placement. The first part, I've seen also in the rhythm *Lamban*; it might be used in other rhythms as well. Both these bass note positions, as we have seen, are solid indicators of *two-ness*, and, taken together, articulate the two side of *son* or *rumba clave*.

Djole

The next rhythm in my random selection is *Djole*, or *Jole*. *Jole* was originally a festive mask dance of the Temine people, now popular around West Africa. It has been adapted for *dunun* and *jembe* from the square *siko* drums. (Billmeier and Keïta 2004, 138–39)

The figure displays five staves of musical notation for the *Djole* rhythm, all in common time (C). Each staff begins with a double bar line and a repeat sign, followed by the time signature 'C'. The notation is as follows:

- Jembe 1:** A single melodic line with eighth notes and rests. The first measure contains two eighth notes, followed by two eighth notes with 'x' marks above them, indicating a specific rhythmic pattern. This pattern repeats across the staff.
- Jembe 2:** A single melodic line with eighth notes, similar to Jembe 1 but with a different rhythmic arrangement.
- Bell and Sangban (middle):** A pair of staves. The upper staff has eighth notes with diamond-shaped accents above them. The lower staff has eighth notes with 'x' marks above them, indicating a specific rhythmic pattern.
- Bell and Kenkeni (high):** A pair of staves. The upper staff has eighth notes with diamond-shaped accents above them. The lower staff has eighth notes with diamond-shaped accents above them.
- Bell and Dununba (low):** A pair of staves. The upper staff has eighth notes with diamond-shaped accents above them. The lower staff has eighth notes with diamond-shaped accents above them.

Figure 42. *Djole*.



Audio Example 29. *Djole* (CD Track 29).

Pedagogically, this is a very simple rhythm and I have used it to good effect with a beginners' class. Given its two bar (or two clave) phrase length, it can be difficult for *jembe 2* to remember where his or her variation belongs, especially as it falls in the middle of the cycle, not at the end as may seem natural. Indeed, this is the only accompaniment I will mention in this discussion as it is the only one that seems to indicate the hypothesized ever-present polarity. It is clear once again that the three-two orientation is indicated by the *bombo* note in the first half of each measure only. The second halves are marked only by on-beat articulations plus the on-beat to on-beat 'roll' at the end of the first bar. In his recording, Keïta on solo *jembe* refers repeatedly to a break figure to mark the end of his improvised ideas:



Figure 43. *Djole* Break.

In similar fashion, this phrase marks the three-side of the polarity, and is always placed so that it is answered by the 'roll' phrase of *jembe 2* on the two-side; together they state in question and answer form the intended polarity. This is rendered more potent as it always follows one of Keïta's solo improvisations which, in typical fashion, accent different parts of the beat structure. Often, this is achieved by linear figures that cross the normal beat and sub-divisional hierarchy, accenting different spots in turn. Or, as Penalosa puts it: "Over the rhythmic foundation...the lead articulates varied phrases, carrying on contrapuntal "conversations" with the repetitive parts." (Peñalosa and Greenwood 2009, 179) After presenting his personal, dynamic rhythmic-melodic vision thus, the soloist returns to clearly state the normal polarity being kept by the ensemble, thereby strengthening the impression that he or she was not lost, but merely on a journey of perspective. We will touch on this subject several more times in this narrative.

Yankadi/Makru

The fifth and final rhythm in the selection is a two-part piece called *Yankadi/Makru*. *Yankadi* and *Makru* are courtship dances of the Susu people, played in succession. The first is a slow line dance, and the second, *Makru*, is fast, danced by couples that had paired up during the slower *Yankadi* section.

The musical score for *Yankadi* is presented in five staves. Each staff begins with a double bar line, a repeat sign, and a common time signature (C). The parts are:

- Jembe 1:** Four measures of rhythmic notation with notes and rests.
- Jembe 2:** Four measures of rhythmic notation, including rests marked with 'x'.
- Bell and Sangban (middle):** Four measures of rhythmic notation with notes and rests.
- Bell and Kenkeni (high):** Four measures of rhythmic notation with notes and rests.
- Bell and Dununba (low):** Four measures of rhythmic notation with notes and rests.

 Each staff ends with a double bar line and a repeat sign (:||).

Figure 44. *Yankadi*.



Audio Example 30. *Yankadi* (CD Track 30).

By now, the analysis procedure is quick and clear. The first *jembe* part, along with bass strokes on each beat, plays the *quintillo* rhythm in its first half, which includes the *bombo* and *ponche* notes; the second half clearly outlines *two*, ending in beat four with the same notes played in beat two. This structural repetition emphasizes the difference between beats one and three. Furthermore, as we have seen previously, it illustrates how *ponche* can function as *three* or *two*. *Jembe 2* uses the same rhythmic figure, with contrasting sounds, in beat one to articulate *bombo*, then clear, powerful flam and slap sounds on the *two* in its second half.

The *sangban* is outlined by *quintillo* on bell. Here again, the exact repetition in the two halves provides a shorter backdrop groove against which the other, polarized parts stand out. It also shows again that *ponche* (emphasized as the second in a two-note motif) can stand in the three side or two side. The *kenkeni* is very clearly stating the *three-two* polarity with the same elements discussed all along—*bombo* then (including the last stroke on bell) all four *two* articulations. The *dununba*, though it plays *bombo*, uses that same subdivision before every beat, emphasizing the beats and the sixteenth note sub-structure, which in the recording swings considerably; this grounds the ensemble in another manifestation of multidimensionality vis-a-vis *two* and *three*—feel—to which we will turn shortly. Here another juxtaposition is offered from the slow, swinging *Yankadi* to the fast, much straighter *Makru*.

Figure 45. *Makru*.



Audio Example 31. Makru (CD Track 31).

Here, the first *Jembe* part is almost the same as that for *Yankadi*, with a few strokes removed: the bass notes on beats two and four and the slap before *bombo*, or the 'and' of beat one. The analysis is the same as for *Yankadi Jembe 1*. The strokes are most likely left out to help the player execute the part at high speed, about double that of *Yankadi*. *Jembe 2* of *Makru* articulates rumba clave, with an added 'secondary downbeat' (written in two bars, as discussed previously) on beat three, and another as a pick-up to beat one. As discussed above, this static figure before and on beats one and three anchors the groove and creates a dialogue with the other elements, which are not static but rather polarized into their *three* and *two* functions. The first half of the third *jembe* part shows another way to articulate the *three* dimension; if taken without the bass notes on the beat, it uses *tresillo* permutation 4. Different from the normal *tresillo* by only one note, this pattern seems another candidate for a clear articulation of the on-beat three in binary time. The second half of *jembe 3* is clearly articulating the *two*.

The *sangban* bell plays clearly in *two* as well, with the drum on the downbeats and *ponche* notes of each half. I hear this as exploiting the same ambiguity of the *ponche* note; it is with the *two* but suggests the *three* as well. This is one of the most commonly articulated rhythmic 'spots' in music from all over the African Diaspora, usually played with the 'tone' sound on a drum. This tends to stand

out against (or within) the background. We've seen this in all the *jembe* rhythms presented thus far; it is standard in Cuban Rumba, Salsa, Merengue, much Brazilian music, Rhythm and Blues from the US, and so on. If there is a 'go-to' rhythmic position for African based folkloric music or for a percussion pattern in popular music (usually played around the basic time articulated by the drum kit), *ponche* is at the top of the list. The preceding discussion suggests that metric ambiguity, being an essential aesthetic locus of the aforementioned music, is perhaps the reason for the popularity of the *ponche* rhythmic placement.

The *kenkeni* plays the *bombo* and *ponche*, but repetition on the last two subdivisions of every beat suggests its function is rather to articulate the upbeats, as a static anchor contrasting with the downbeats and the *three-two* polarization. This is also a very common pattern in African Diaspora music. The *dununba* in clever fashion plays all the on beats, but also states the *three two* polarity quite clearly; from beat one to two the movement is via the *bombo*, giving us *three*. From beat three to four, it is via the 'and,' giving a clear *two*.

Polarity, Contrasting Metres and Dimensionality in the West African Sample

This detailed discussion of five primarily binary pieces from the Mandeng repertoire does not constitute a large sample size, nor does it attempt to represent a large cross section of West African music, much less African Diaspora music. To present a statistically significant analysis of the clave/polarity concept is beyond the scope of this study. What was accomplished by this line of inquiry, however, was the development of a germinal methodology for analysis of this type. Moreover, small though it was, the pool of rhythms so far examined has garnered a 100% pass rate. If the null hypothesis was to show a counter example, that is, one that does not demonstrate a clear polarity between the proximate *three* and contrasting *two* metres, then, so far, it would be rejected.

However, as this investigation began, I suggested that the polarity in the ternary modality is not between *three* and *two*—though that is one ever present point of multi-dimensionality—but rather between on-beat *three* and off-beat *three*. In a sense, these two contrasts equate to harmonic and linear ways of increasing dimensionality, although those terms will take on other significance in later discussions; the *three* and *two* that we have examined as this:



and this:



Figures 46 and 47. *Three and Two, Ternary and Binary Forms.*

present a harmonic dimensionality, whereas the on-beat/offbeat *three*, which has in binary clave terms mostly been referred to this in discussion as three-side and two-side, increase dimensionality, or complexity, if you will, in a linear way; they are sequential...cyclical yes, but sequential nevertheless.

A Polymetric Perspective Clarifies Terminology

But why the confusion in terminology? Why do we go from talking about on-beat *three* and offbeat *three* with *two* in ternary mode and then switch to (proximate) *three* with *two* and then just *two* with *two* in binary mode? The answer seems to lie in the observation made somewhat earlier and mentioned as a cornerstone of Toro's perspective that the primary offbeats of odd metric cycles—the ones in the middle—will land together. This means that the primary offbeat of *three* (or *five*, *seven*, etc.) coincides with the offbeat of *one*, which is, of course, the second note of *two*. This coincidence of metric cycles lends a point of resolution between the two making the offbeats of the odd cycle (*three*) agree with the latter half of the even cycle (*two*). This idea is also noted by Peñalosa when he states: “Rhythmic tension is generated on the first half of clave and resolved in the second half. Tension is initiated on primary *bombo* and resolves where the main beats and clave coincide.” (Peñalosa and Greenwood 2009, 104) The tension in this case is from the meeting of the 'primary' and 'secondary' beat cycles, to use his terms, that is, *two* (primary) and *three* (secondary). Though I debate the use of these terms and perspective elsewhere in this study they are meaningful given the perspective from which Peñalosa works. He goes on to say, “The two cells of clave cycle in a call-and-response or antecedent-and-consequent sequence. The three side of clave is commonly referred to as 'strong,' (*fuerte*), 'positive,' and 'round,' while the two-side is called 'weak' (*débil*), 'negative' and 'square.’” (Peñalosa and Greenwood 2009, 104) These perceptions of weak and strong, round and square, and so forth speak to the type of interaction that takes place between the *two* and *three* in each half of the patterns. The strong side characteristically shows unison rhythmic agreement on the downbeat, the 'one,'⁶⁷ followed by a rapid divergence to tension of the *bombo* against beat two (of *two*); the *bombo* placement makes us feel as if we are potentially in *three*, and this causes tension against the 'primary' (or, just 'other') beat cycle, *two*. The second half brings a resolution on beat four which can be felt as a singularity of metre, a lack of metric confrontation, or a point of less dimensionality, but in the view espoused here, it is rather the meeting of primary offbeats. The first

⁶⁷ Although the 'one' isn't necessarily articulated, it is understood as the primary reference point in the cycle by all those who understand the style.

half shows agreement on beat one then divergence, the second half divergence on beat three (down-beat of the second half) then agreement on beat four, the primary offbeat of the second half. The middle of the rhythm floats in tension, the beginning and the end are points of resolution but between different aspects of the *three* and *two* poly-metric phenomenon. This applies in ternary or binary interpretations without a change in terminology. Of course, most players of this music have historically been more interested in expressing themselves with the music than with the conceptual terminology, but this discussion lends necessary support to the proposed change from a 'primary' and 'secondary' point of view to a harmonic grid, where the juxtaposition of metres and metric perspectives is ever present, and the feeling always multi-dimensional. This is the hypothesized backdrop which lends AT/Musics of the world their rhythmic potency.

Permutations Wrap-up

And what of the *tresillo* permutations concept? It is tempting to wish that all were now completely transparent with respect to the observations of clave polarity gathered thus far. In fact, some ambiguities still exist. Nevertheless, we can look at our examples thus far and fill in the blanks. All those which articulate *bombo*, I will assign the three (clave side)/on-beat *three* designation. All those which articulate beat two will get the two/offbeat *three* label. This combined with the evidence from the pieces examined looks like this:

1		Three side/on-beat <i>three</i> ; <i>tresillo</i>
2		Two side/offbeat <i>three</i>
3		Two side of Djagbe Sangban
4		Three side/on-beat <i>three</i> ; <i>Makru jembe</i> 3
5		Two side/offbeat <i>three</i> ; Penalosa's 'Displaced <i>Tresillo</i> '
6		Three side/on-beat <i>three</i> ; Three side of <i>Djagbe Sangban</i>
7		Two side/offbeat <i>three</i>
8		

Figure 48. *Tresillo* Permutations Functional Summary.

Still two problem areas exist, permutations 3 and 8. Number 3 we have seen function clearly as *two* in traditional practice, but can we justify that it has unique two-ness? Number 8 is very similar to 3. This is a problem that was on my mind during the analysis, namely what about the so called, 'Brazilian Clave,' which is essentially the same used in New Orleans second-line music. Both are often found in two-three direction, but I've kept the three first for comparison.



Figure 49. Brazil/New Orleans 'Clave'.

In the second half, we see the 'and' of beat three, which is a clue to *two-ness*/offbeat *three-ness*, but the previously considered all-important second beat (primary offbeat, beat three) is displaced by one sixteenth. Looking at the box chart again, we can compare it with the *three* archetype as well as the normal *tresillo*.

Three metre	O n e	2	3	4	A n d	6	7	8	T w o	1	1	1	A	1	1	1	T h r e e	1	1	2	A	2	2	2	notes
Onbeat <i>three</i>	X								X								X								
Offbeat <i>three</i>					X								X								X				
<i>Tresillo</i> 1	X									X															'3 side' model
<i>Tresillo</i> 3	X						X									X									'2 side'; Djagbe
<i>Tresillo</i> 8							X									X						X			
Offbeat <i>two</i>							X																		
Onbeat <i>two</i>	X												X												
(offbeat <i>four</i>)				X					X							X						X			
<i>Two</i> metre	O n e			' e '			A n d		' a '				T w o			' e '				A n d		' a '			

Figure 50. *Tresillo* Permutations 1, 3, and 8 Timing Analysis.

First, note that for both permutations 3 and 8, the articulation in question falls just one box short of the third beat of *three*; This is not what our theory would predict and yet the feeling of polarity is still clear in the two examples which utilize this rhythmic placement. Both of these rhythmic combinations, *Djagbe* and Brazilian/Second line clave, suggest metric similarity between the first and last articulations of the pattern. We have seen this before, notably with the archetypal ternary standard pattern where the offbeat three/and two coincide on the fourth beat then again on the downbeat; this creates a feeling of rest at the end and beginning of the pattern until tension is again initiated on the *bombo* note. In the present case, the metric similarity is closer to the feeling of on-beat *three*, so that the tension between metres is initiated before and carries through the downbeat. In the case of the *Djagbe sangban*, this idea is sonically reinforced by the presence of muffled strokes in these two positions. It feels to me when playing this rhythm that the height of tension *and* (partial) resolution is on beat one. It seems the *two-ness* comes from the two consecutive strokes on beat three (secondary downbeat, or beat one above) and the 'and' that follows.

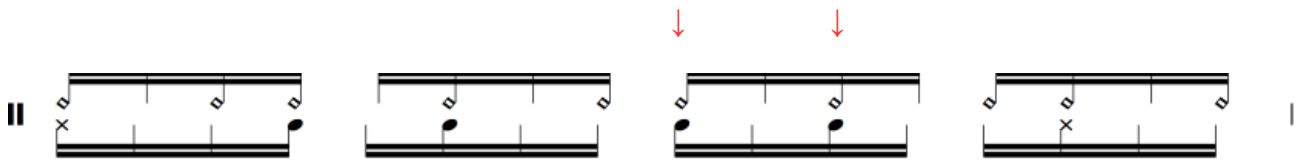


Figure 51. *Djagbe Sangban* 'Two-ness'.



Audio Example 32. *Djagbe Sangban* and Bell (CD Track 32).

In the case of the Brazilian/Second line clave⁶⁸, there are not two consecutive expressions of two but there are two consecutive 'and' placements. Here again we see the ambiguous nature of the *ponche* position to be either primarily *two* or *three*. It is also worth noting that: 1) This rhythm is not really thought of as a clave, with the same crucial function of the clave in Cuban music, nor is it, from what we know, of African origin (see footnote below); 2) The pattern of dotted note articulation (strikes articulating three subdivision units) is almost unbroken in this rhythm: x..x..x...x..x..

⁶⁸ Although referred to by some musicians as 'clave' and similar to the Cuban Son Clave, the pattern is disputed as such. Percussionist, composer and bandleader Booby Sanabria states that according to Brazilian drummer Duduka da Fonseca, composer Antonio Carlos Jobim invented this pattern and, "later regretted it because Latino musicians confused it with the Cuban concept of clave, which was not his intention and is not used in Brazilian music." (Peñalosa and Greenwood 2009, 249)

This tends to produce a rhythmic drive related to this cross-rhythmic structure that pulls at the listener/performer into hearing it from this other point of view. The dotted note articulation is broken between the third and fourth notes only, the same notes that indicate *two-ness* from our other analytical standpoint. More will be said about dotted notes elsewhere in this paper; 3) A polarity of sorts is generated by the alternation between the first half, which is *tresillo*, and the second half, which fits decidedly between the *tresillo* notes. The notes of the two side (in clave terms) go around the secondary *bombo* note just as they do in the *son* and *rumba claves*, but instead of being evenly placed around the *bombo*, they sound just before it and then again just before the *ponche* note. This motif creates its own differentiation and hence polarity from the *tresillo* three side.

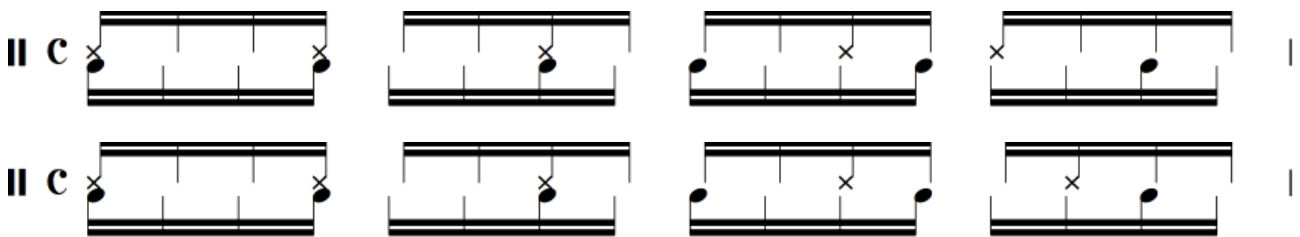


Figure 52. Son Clave and Brazil/New Orleans 'Clave' with Tresillo.



Audio Example 33. *Tresillo* with *Son* and Second Line *Claves* (CD Track 33).

On this note let us briefly revisit the *tresillo* combined with its own permutations chart.

1		Three side/on-beat <i>three</i> : Model/with tresillo
2		Two side/offbeat <i>three</i> : Clearly off of tresillo
3		Two side of <i>Djagbe Sangban</i> : Off-tresillo
4		Three side/on-beat <i>three</i> ; <i>Makru jembe 3</i> : With tresillo
5		Two side/offbeat <i>three</i> ; Penalosa's 'displaced tresillo': Clearly off-tresillo
6		Three side/on-beat <i>three</i> ; Three side of <i>Djagbe Sangban</i> : With tresillo
7		Two side/offbeat <i>three</i> : Off-tresillo
8		Off-tresillo

Figure 53. Tresillo with Permutations: Functional Wrap-up.

This method is perhaps simpler and gives clear cut results, that, luckily, agree with the conclusions arrived at through the more prosaic, more analytical process that has been the basis of this section. The discussion has proved valuable, nevertheless, allowing us to consider the quality that certain rhythmic placements or combinations thereof can lend to a polarized, *two* with *three* polymetric binary correlate structure, a structure which, despite the big name, is probably the basis for most of the world's music, particularly from the perspective of most (re)played and therefore most heard, in our modern age.

Binary, Sequential, Metric Polarity Summary

This method of looking at clave-like polarity—and therefore sequential metric polarity—in a four-beat motif has proven insightful. It seems to me that the *tresillo* permutation exercise does not directly supply the raw material for any and every African, polarized pattern; we have seen several examples, even in this small pool of five dance rhythm orchestrations, that use other rhythmic devices, such as three or four articulations on the on and offbeats of *two* to indicate the two side of clave, or just the *bombo* note to indicate the three side. If, as surmised previously, Toro's statement as to their universality is taken to mean that any pattern can be generated with a combination of subdivisional groups in threes and twos, that is something different which does not guarantee the implied metric polarity I have been testing for. Nevertheless, through this method of investigation, at least three important things have been demonstrated: 1) That the rhythms examined showed 100

percent adherence to the principle of metric polarity as a pre-requisite for African traditional (as opposed to popular or jazz) rhythm, as has been suggested by Novotney and Peñalosa, among others; 2) That there are demonstrable criteria that, though not without the ambiguity that is so often at the heart of artistic expression, indicate structurally how this polarity is manifested in a binary rhythmic environment; 3) That this phenomenon can be shown to operate in principle in the same way that it does in a ternary rhythmic environment, thus offering structural criteria for the previously anecdotal connection between these two feels.

Pedagogical Possibilities and Perspectives

This system of permutations and other key criteria could be used as a partially complete method to devise other rhythms that are in clave, by combining those that represent the *three* side/on-beat three with those that represent the two side/offbeat *three*. The same could be done with *quintillo* or other foundational patterns, or even fully fleshed out in-clave patterns such as *cascara*. Toro, in fact permutes *cascara* in his latest book, *From Linear to Harmonic*. (Toro 2014a)

I have my reservations about going too far into permutations and other such cognitive approaches to pattern generation, and ultimately, composition. I believe that all avenues to musical expression are valid and worthy, but turning again to the language metaphor, there are some that draw on established patterns of expression from which they might evolve to radically different approaches, and there are others that attempt to generate new patterns of expression from intellectual ideas, from random numbers or random noise; this is perfectly acceptable but in my experience produces music which fails to move me as much as music based on the former approach.

Back to the realm of Latin music, it seems that Cuban musicians do not use the two-three or three-two clave concept in their thinking on music, but prefer to rely on their 'natural' sense of the music, developed through listening and playing. For example, from renowned *conguero* Mongo Santamaria: “Don't tell me about 3-2 or 2-3! In Cuba we just play. We feel it, we don't talk about such things.” (Washburne 2008, 190, cited in Peñalosa and Greenwood 2009, 249) Peñalosa mentions similar perspectives in his notes, including those of classically trained musicians Dafnis Prieto and Alain Pérez: “In Cuba we do not use the 2-3, 3-2 formula...2-3, 3-2 [is] not used in Cuba. That is how people learn Cuban music outside Cuba.” (Peñalosa and Greenwood 2009, 249)

With these reservations stated, I refer back to the section titled, “The Proof is Within” (page 76), where the reader will be reminded that I am operating in a decidedly hybrid realm embracing both traditional approaches, including organic learning, intuition, playing by feeling and by ear, *and* intellectual approaches such as the consideration of rudimentary or archetypal patterns, analysis, permutation, and practice and compositional material generated by those cognitive modalities. Thus,

the aforementioned approach of combining traditionally generated patterns randomly but based on their on-beat and offbeat, polymetric leanings, can produce interesting new material; likewise, this approach might be used to help an outsider (or 'hybridized insider') play 'in-clave' from a different perspective, and from a different pedagogical experience. A few examples follow to illustrate some ways the process might develop. From the previous *tresillo* chart:


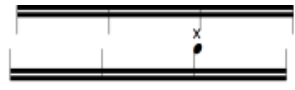
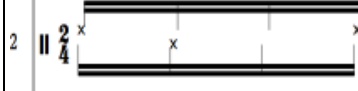


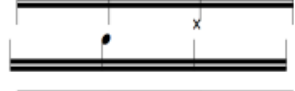
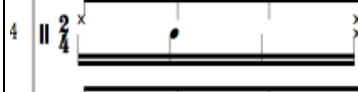


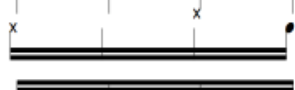
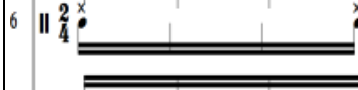
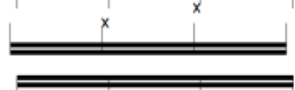
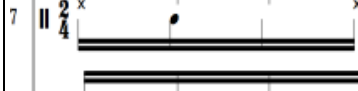
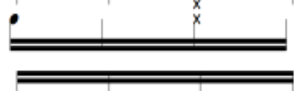


1			Three side/on-beat <i>three</i> : Model/with tresillo
2			Two side/offbeat <i>three</i> : Clearly off of tresillo
3			Two side of <i>Djagbe Sangban</i> : Off-tresillo
4			Three side/on-beat <i>three</i> ; <i>Makru jembe</i> 3: With tresillo
5			Two side/offbeat <i>three</i> ; Penalosa's 'displaced tresillo': Clearly off-tresillo
6			Three side/on-beat <i>three</i> ; Three side of <i>Djagbe Sangban</i> : With tresillo
7			Two side/offbeat <i>three</i> : Off-tresillo
8			Off-tresillo

Figure 54. *Tresillo* Function Reference.

Here is number 6 with number 2:



Figure 55. Hybrid Pattern 1.

Here are numbers 6 and 8:



Figure 56. Hybrid Pattern 2.

Next, 4 and 2:



Figure 57. Hybrid Pattern 3.

And 4 and 3:



Figure 58. Hybrid Pattern 4.

Finally, a deliberately ambiguous one, using two 'two' sides in a row. This is 7 and 8:



Figure 59. Hybrid Pattern 5.



Audio Example 34. Polarized Permutations Hybrids (CD Track 34).

Finally, we should note that even in Cuba, probably the origin of this kind of conceptual/compositional analysis *vis-a-vis* the *clave* concept, *clave* strictness is not an absolute. Any of the phrases seen in this analysis might be used, especially by modern Cuban musicians and composers such as those working in the *Timba* style, counter *clave*; that is, purposefully placed in an opposing or 'wrong' orientation. Indeed, this sort of 'clave-license' has long been the prerogative of the lead (in Cuban *Rumba*, the *Quinto*) player, in folkloric percussion and vocal music, as well as in more modern derivatives using European instruments. To revisit the language analogy yet again, in our mother tongues, we all know when to use 'proper' grammar and when to break rules for effect. As Peñalosa puts it:

...timba takes great liberties with the prescribed order of *clave*. Some say that the new music is *cruzado* and the great art of arranging music in-*clave* is being lost. Others say that the young Cuban musicians are merely taking, "clave license" and employing among other things, *quinto*-inspired concepts.⁶⁹ (Peñalosa and Greenwood 2009, 230)

and, from composer Alain Pérez:

⁶⁹ Note that 'cruzado' means, 'crossed.' This is normally a strong criticism indicating a mistake; 'quinto' is the lead drum in Cuban rumba.

When I conceive a *tumbao*, I don't stop and think or write to see where the clave fits and where it doesn't...in *tumbaos* developed in Cuba, you hear *quinto* hits. For many years now in Cuba the bands have been employing different rhythmic patterns. It is amazing how the bass and piano have evolved in Cuba, and that is not something that stops. As I was telling you, the rhythm is the most important, internalizing the percussion, the clave, the rumba. If you know the essence of this, the possibilities are infinite. If you don't, you will never catch up to what is being done in Cuba. (“Alain Pérez Interview Part 2”)

To attempt to play in clave without immersing oneself in music that demonstrates that aesthetic would be ill-advised. Though some ideas for a creative approach to using the analytically derived material generated in this discussion have been presented, the emphasis is, once again, on how polarity is demonstrated. This material could be used in strict adherence to African Diaspora style polarity, purposeful non-adherence, or perhaps somewhere in between, where art often thrives.

Feel

What about music that works with one primary rhythmic line? In music that does not feature the juxtaposition of separate parts that are (hypothetically) generated from different metric conceptions, does the harmonic perspective of rhythm still apply? One way that it does, according to Toro, falls in the realm of feel. Feel, as the word suggests, seems to be best communicated not by analysis but by exposure and awareness. The literature, starting with Keil, has long suggested that the analytical approach embodied in the process of notating rhythm falls short of producing music with the range of nuance that is demanded from a good performer.

'Perfection' is no Ideal

“Music, to be personally involving and socially valuable, must be, ‘out of time’ and ‘out of tune.’” (Charles Keil 2005, 96)

Keil coined the term, “Participatory Discrepancies” to indicate that music played by people, as opposed to the idea of music represented by notation and its implied conceptual framework, is full of ‘discrepancies’, or variations from the notated idea. (Charles Keil 2005, 1995)

The Long and the Short(er) Roads

The usual method to learn to reproduce a particular kind of groove for a particular style or piece of music is rooted in lots exposure and imitation of that music. The downfall of complete reliance on this method is the time required for the comprehension of a particular groove. Writers in both academic and instructional fields have suggested that the way to intellectually grasp grooves that do not neatly line up with standardized subdivisions as represented in musical notation, particularly in African and African diaspora music contexts, is to think of the subdivisions of the beat as somewhere in between binary and ternary. (Hernandez 2000; Billmeier and Keita 2004; Schepers 2005; Spiro and Ryan 2006; Toro 1995)

This perspective does not offer a precise temporal orientation. It is rather a prescription for the development of an experiential perspective. By learning to alternate between binary and ternary subdivisions while playing, one develops a felt sense of the space between the strict metric interpretations of those subdivisions. In this way, it is supposed that the musician develops and refines a sense of elasticity in music which helps to be able to articulate various ‘in between’ or ‘in the cracks’ feels while never losing a strong sense of the larger metric cycle.

Toro goes farther than most, however, in attempting to define the actual metric interactions that produce several exemplary feels, thereby differentiating the approaches allegedly driving those cultures to favour their particular feel, as well as attempting to define a shortcut to get 'in' without years of exposure.

There are as many potential feels as there are cultural music traditions or even as many as there are individual exponents of those traditions. Therefore, once again, I will not attempt to produce an exhaustive or statistically significant list but rather deal with two that Toro defines. I will also look at some of the literature that has attempted to measure those feels and see if the two corroborate.

Bridges of Understanding

For Toro, whereas compositional material in rhythmic music emanates mostly from the interaction of two and three at the metric level of beat markers, feel is generated by the interaction of two and three within beats, that is, at the subdivision level. Looking at the harmonic series again, if the metre is generated by *two* main beats to a cycle, along with *three*, the feel is established by the way that *four* and *six* interact. This is akin to combining, or superimposing the ternary and binary structures discussed in the previous section. In fact, several theorists including Toro suggest that this is indeed close to the real generative perspective, at least in some very elastic feels such as that found in the Cuban *Rumba*. (Toro 1993a, 1; Hernandez 2000; Peñalosa and Greenwood 2009, 228–29)

Still, there is usually a clear guiding structure; *Rumba Columbia* feels mostly ternary whereas *Rumba Guaguanco* mostly binary. However, Polak complains that in his early experience in Mali, finding himself at a loss to understand whether a piece in question was binary or ternary, he resorted on several occasions to transcribing it both ways. (Polak 1998) Although several have suggested it is in between these two that many feels lie, no one else to my knowledge has offered concrete, theoretical prescriptions to generate them. Toro himself admits there is really no way to accurately notate feel, but his methods promise a quicker road to acquisition bridged by understanding.

The Feel of Brazil

Toro considers Brazilian⁷⁰ feel to be the product of the interaction of the second two notes of a triplet with the second note of a duplet, or group of two, along with the beat itself. This is simply the two and three sub-divisional groups together, but heard as one line, without unison strikes. This timing, applied to the interpretation of sixteenth notes and with the proper accents, allegedly gives the classic Brazilian feel. The accents come at several different levels, but from the same concept, namely that the offbeat is accented. Toro claims that all 'ethnic' music in the world is accented on the offbeat. (Toro 2012d) So, heard in two, the second beat is accented. In a *Samba*, this would usually be played by the lower *Surdo* or bass drum. At the level of duplet subdivisions, the second is accented, and at the level of triplet subdivisions, the second is also accented.

⁷⁰ Brazil is of course a vast country with a vast musical and cultural landscape. This is a general discussion covering Afro-Brazilian feel.

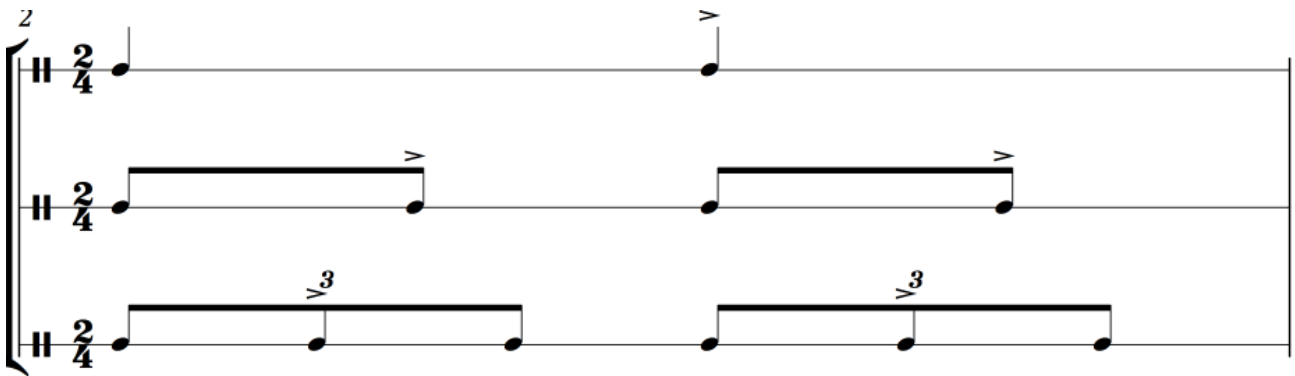


Figure 60. Toro's Brazilian Feel 'Formula'.



Audio Example 35. Computer Generated Brazilian Feel Formula (CD Track 35).

This could be conceived, of course, as the linear *two* and *three* described earlier, counted in *three* as, 'one, two and three,' or in two as, 'one, (trip), let, two, trip, (let), but at a faster pace than indicated previously; now this happens within each beat, and most certainly must be 'felt', not counted.

From a linear point of view, we are replacing this decidedly mechanical interpretation:



with this:



Figures 61 and 62. Sixteenth Substitution from a Linear Perspective.

Commodification Antithetical to Depth?

Conceptually, however, the first interpretation is more potent as it implies, as discussed throughout this paper, that even a single line, without sequential variations that refer to other metric structures, is nevertheless representative of a harmonic conception of time through this element of feel. This feel then becomes the backdrop against which and from which all the music is interpreted. Toro is insistent that this perspective, whether conceptually informed or not, is key to understanding and performing a given AT/Music, but that this point of view is lost in the marketplace and pedagogy of many performers and institutions. According to Toro:

The sound of the music is not in the pattern (or the instrumentation), it's in the music (the feel). If you buy books to get patterns of music, you are wasting your money. People talk about independence in music, it's nuts; the more dependent you are in the music

(working within the feel grid), the more you can move around. That's what you practice (the grid). You don't practice anything else. Whatever pattern you learn, you can make it sound Brazilian...with that. Don't look for patterns. Look for the sound. The sound is a composite of many different elements. The composite is more than its elements.” (Toro 2012e)

Quantitative Analysis

But is it possible to prove the validity of Toro's proposition? I decided to look at the work of Gerischer, as she is the only author I know of who has published work that attempts to quantitatively evaluate feel in Afro-Brazilian music. (Gerischer 2006) She measured timing placements for various instruments in several ensembles and chose to use Jairazbhoy's 'Nominal Units of Time' (NUTs) system to evaluate her results. (Jairazbhoy 1983) This system proposes a measurement system of 100 units, comparable to Ellis' system of musical cents used to measured pitch. (Ellis 1885) Gerischer applied the 100 unit measurement to each sixteenth note articulation so that, hypothetically, one beat would contain 400 units, one measure 1600 units. The pieces are in notated in 4/4 time using the TUBS (Time Unit Box) system. (Koetting 1970)

For the first piece, a *samba da roda* performed by a group from São Félix, Bahia, she found the following average timing values:

Beat/subdivision	1	e	&	a	2	e	&	a	3	e	&	a	4	e	&	a
Reco Reco/NUTs	97	85	96	121	100	88	101	114	96	87	94	124	102	82	94	120
Triangle/NUTs	108	76	99	119	105	76	100	113	104	79	100	118	105	78	100	118
Pandeiro/NUTs	107	74	93	128	104	80	89	123	114	73	85	126	112	78	91	121

Table 13. Samba da Roda Average Timing Values. (Gerischer 2006)

By dividing a beat of 400 NUTs into three and then dividing the second of those beats in half, we should get Toro's predicted, ideal timing values.



Strike timing:	100	100	100	100	
Cumulative timing:	0	100	200	300	400



Strike timing (round):	133	66	66	133	
Cumulative timing:	0	133	200	267	400

Figures 63 and 64. Straight and Harmonic Model Timing, NUTS.

COMPETING INFLUENCES

At first glance, the figures don't seem to agree with Toro's model. Looking at Gerischer's graphs of the data, however, and her interpretation, Toro's idea starts to hold more weight. She describes the feel as, 'medium' (~100), 'short' (~80), 'medium', and 'long' (~120), noting that the especially long timing of the last note was a characteristic feature in all the Bahian Samba music analysed. The theoretical harmonic model predicts long-short-short-long, which can be construed as the same general shape, with longer timings for the first and last subdivisions. The data is close to the standardized 100 NUTs; this is why it is still heard as a binary piece. But it has a shape that corresponds to Toro's predictive model, as we can see in the following chart.

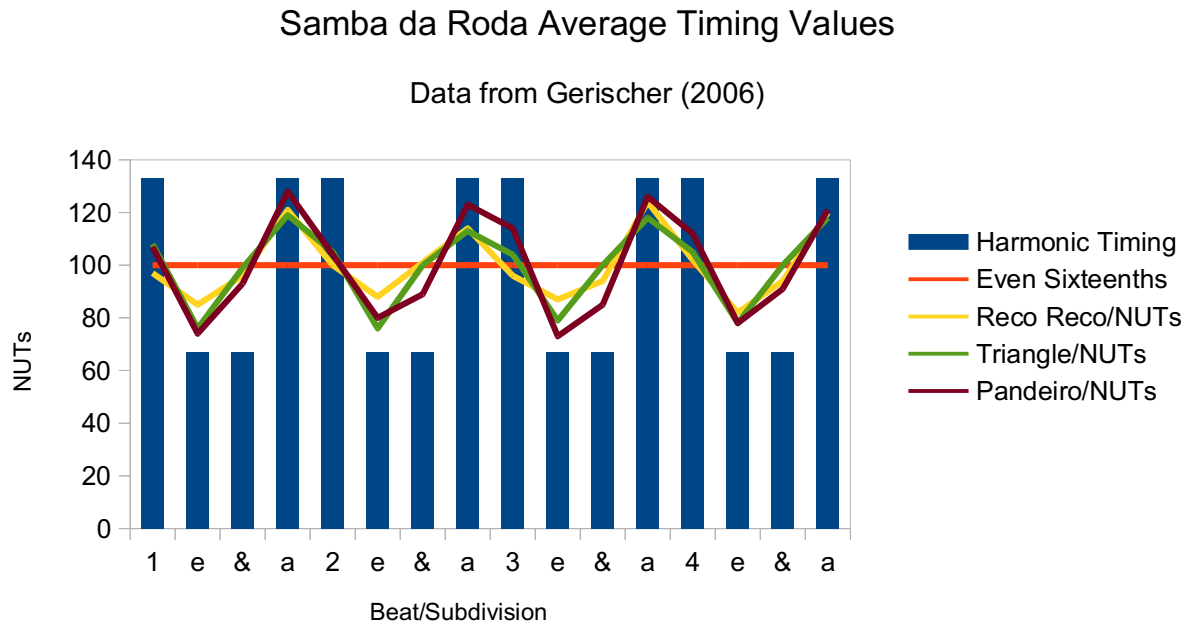


Figure 65. Samba da Roda Average Timing Values.

The red line represents the mechanical timing indicated by standard notation. Although the lines representing the average timing for the other instruments don't ever reach the predicted values from the harmonic model, their shape indicates an influence. It is as if each timing paradigm exerts its own sort of gravity on the players and they do their best to compromise. The timing lines point toward the high and low timing values in the harmonic model, while zigzagging around the mechanical sixteenth note line.

CUMULATIVE VALUES: POSITION WITHIN THE BEAT

Also notable in this graphic portrayal is that each instrument crosses the red line very near to the 'and' (&) or the middle of the beat, as the harmonic model indicates. This is true for every beat. These are average timing lines, representing length of articulations, not placement within the cycle. Given that the on-beat strikes had values close to 100 and that the first subdivision or 'e' strikes were all considerably lower (as predicted by the harmonic model), the middle or 'and' strikes would also fall short of the dead-centre 200 NUTs mark. This idea begs an analysis of cumulative timing values, to see where each instrument and each model strikes within the beat, rather than just looking at their lengths. I added Gerischer's timing values which, as the NUT analysis concept would specify, total approximately 400 for each beat. As with Polak's study in Mali (Polak 2010), Gerischer notes that the timing of the beats themselves is very consistent, so I will not concern myself with variation at that level, but rather the cumulative timing values within each beat. The data now looks like this.

Beat/subdivision	1	e	&	a	2	e	&	a	3	e	&	a	4	e	&	a	1
Reco Reco/NUTs	0	97	182	278	399	100	188	289	403	96	183	277	401	102	184	278	398
Triangle/NUTs	0	108	184	283	402	105	181	281	394	104	183	283	401	105	183	283	401
Pandeiro/NUTs	0	107	181	274	402	104	184	273	396	114	187	272	398	112	190	281	402
Harmonic Timing	0	133	200	267	400	133	200	267	400	133	200	267	400	133	200	267	400
Even Sixteenths	0	100	200	300	400	100	200	300	400	100	200	300	400	100	200	300	400

Table 14. Samba da Roda Cumulative Average Timing Values, per Beat.

The values now start on the 'e' and end on the first strike of the next beat, as I felt this was easier to understand and visualize. Now each value indicates the relative position within the beats themselves, so we can see, for example, at a glance that all three instruments played their middle or '&' strokes in the 180-190 NUT range, earlier than the middle of the bar or 200 NUTs, as predicted by the two models. Graphically, the data now looks like this:

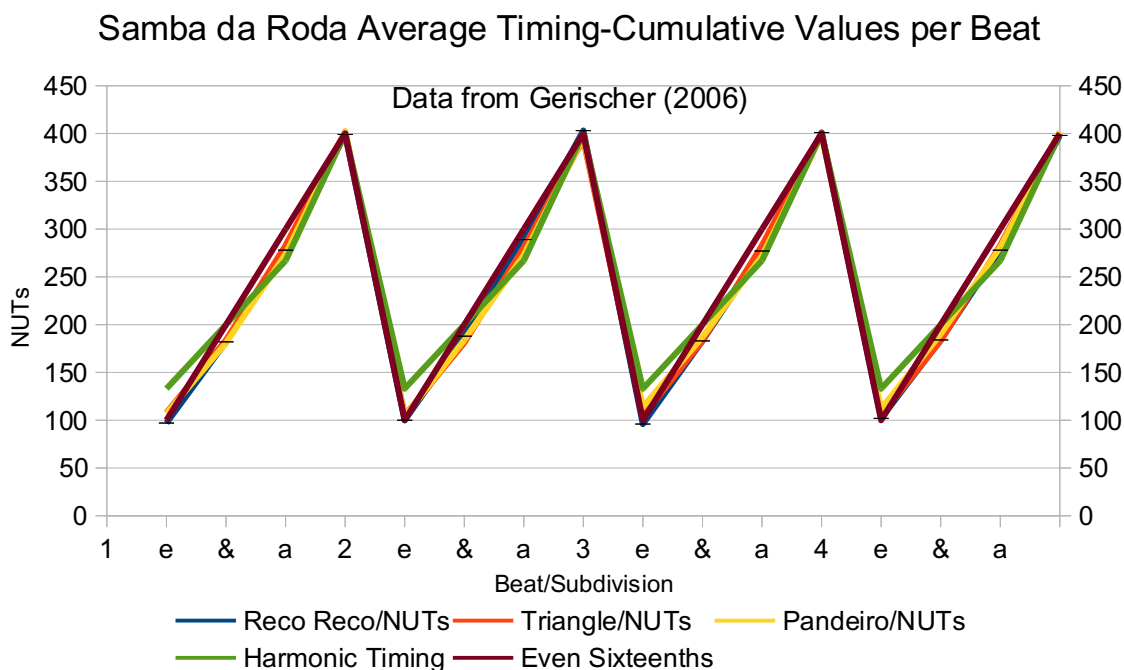
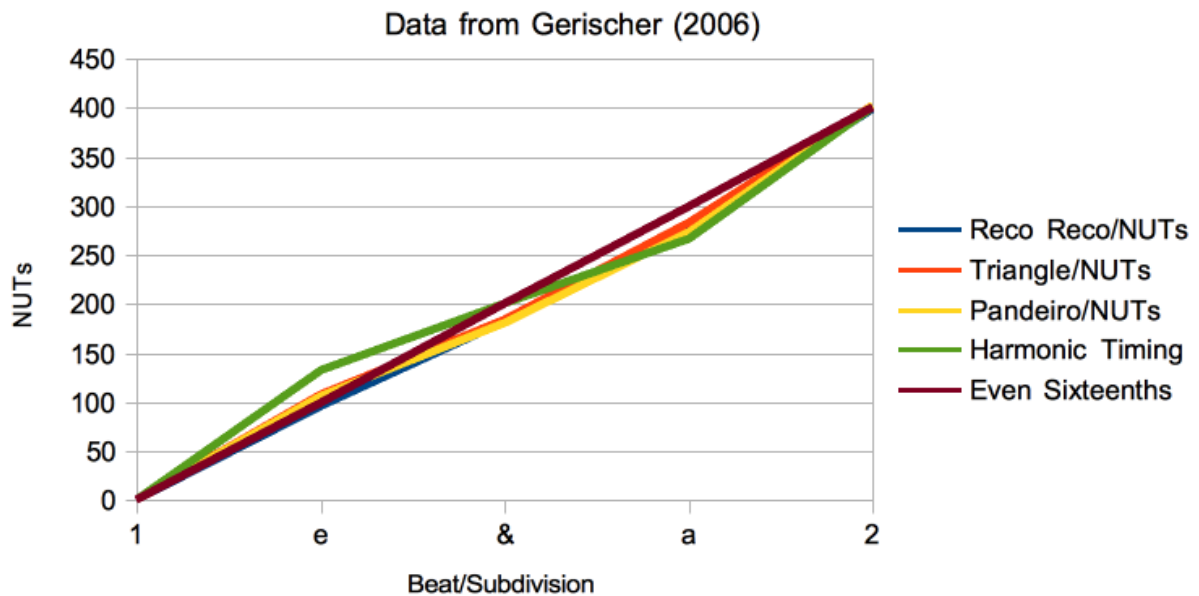


Figure 66. Samba da Roda Cumulative Average Timing Values, per Beat.

ONE BEAT AT A TIME

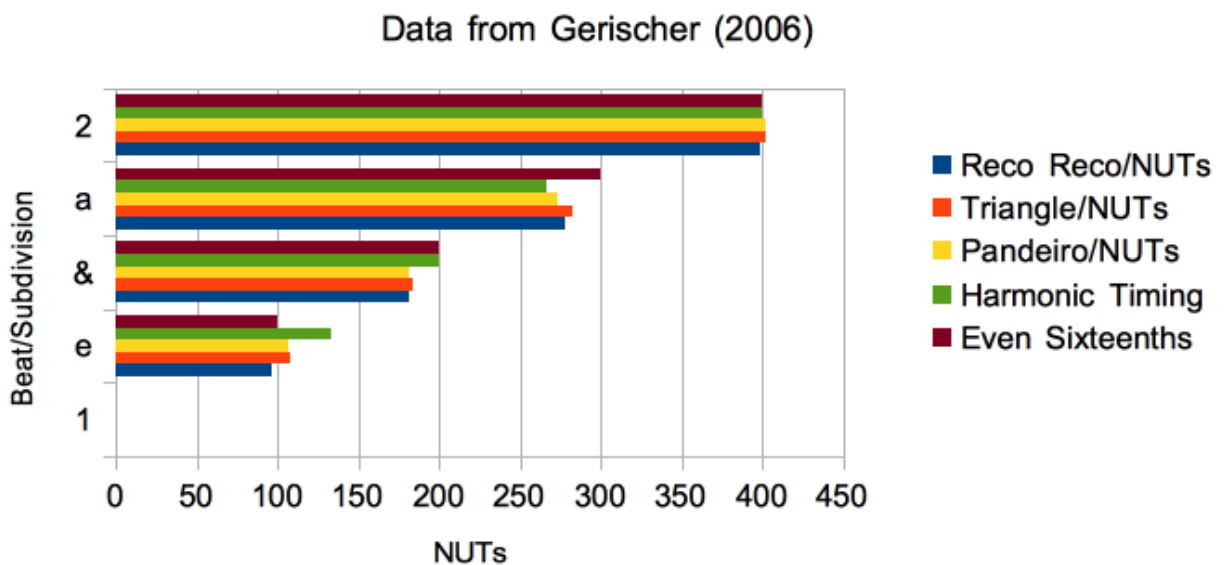
I will assume from this graph that the relative behaviour for each of the instrument/player combinations is similar through the course of each beat. Here is beat 1 by itself, to get a clearer view.

Samba da Roda Average Timing-Cumulative Values, Beat 1



And again as a bar graph:

Samba da Roda Cumulative Timing Values-Beat 1



Figures 67 and 68. Cumulative Timing, Beat 1.

This perspective has made the original data clearer to me. The second strikes (note the first strike in this cumulative timing analysis is the beginning of the beat, with a timing value of zero, and the beats are assumed to have accurate, that is, even, timing as discussed elsewhere) were about the same as a mechanical sixteenth note, not the triplet timing predicted by Toro's model, though the

triangle and *pandeiro* notes were slightly longer. The third subdivisions were short in length, as Toro's model would predict, but the strikes not quite at the middle of the beat as both models predict. The last strokes, however, as shown by their proximity to the green harmonic timing lines in the previous two graphs, are close to the timing of the harmonic model; that is, they are near to being one triplet subdivision's length from the next beat. This characteristically elongated note was noted by Gerischer as a consistent feature in all the recordings of music she made in Bahia.

So it seems as if the 'medium-short-medium long' timing that Gerischer found in the *Samba da Roda* as well as other examples she analysed could be construed as: a first subdivision suggesting even, sixteenth notes; a second subdivision shortened considerably, advancing the whole cycle; the third subdivision again about an even sixteenth in length, but striking early in the beat, having been started early because of the previous short note; this leaves the fourth and final strike about as early as the last subdivision of a triplet. The last, characteristically Brazilian accent is close to a triplet, the others close to sixteenths except for the second which is shortened so there is room at the end for that loping triplet sized feel heading back to the beat. Toro also says he conceives of the standard Brazilian bass pattern for the drum kit as being more like a triplet figure than a sixteenth figure, and compares it to a shuffle, switching between the two without stopping or losing continuity. He says this approach makes it easier to execute technically and sounds more musical. (Toro 2012i)

Brazilian Accents

Toro mentions the accents being key to the feel as well. Perhaps the quick movement from subdivisions two to three, with accents on both, feels like the interaction between the second triplet subdivision and the halfway point, the primary upbeat, or the third sixteenth. Indeed at faster tempos these can have near to a 'flam', or 'crushed' effect, as if one is falling into the other, thus standing out in the overall sound. Gerischer notates the accents of the *Samba da Roda* piece on the first and last subdivisions of each beat for the *reco reco* scraper, as well as a "stressed" slap note on the *pandeiro* just before beats two and four. These are normally considered the standard accents in the Afro-Brazilian feel, usually played most prominently by the *surdo* bass drums, or by the bass drum in standard drum set adaptations. Toro also lists many combinations of this bass drum pattern with different high hat and ride cymbal patterns in his book on Latin playing, *2/3 or not 2/3: A Musical Textbook in Latin Style*. (Toro 1993a) In a lecture at UKZN, however, he disputed the importance of this point. "A Brazilian bass is not, 'Badoo, badoo, badoo, badoo.' Actually, it has nothing to do with that. The idea is of short and long notes." (Toro 2012e)

Interestingly, though she does not name them as accented, Gerischer notates the triangle rhythm for the *Samba da Roda*, which plays every subdivision in question, as, 'damped, open-stroke, open-

stroke, damped.' So, considering the open strokes to have the quality of accentuation within the rhythm, these are the accents Toro prescribes, as well as the same method of accentuation used by the *surdo* drums to bring out the even numbered main beats (beats two and four in a four-beat metric scheme)—by playing open strokes amongst muffled ones. It seems to me that the Brazilian feel has both accents on subdivisions one and four, and on subdivisions two and three, but played by different timbres. Usually one and four are low instruments like bass drums, or thumb strokes on the *pandeiro*, and the two and three accents on higher pitched instruments (those with timbres favoring higher frequencies) like triangle, *pandeiro* jingles, or sticks on the high hats. This argument is not considering timeline patterns that were the main focus of the “Proximate *Three*” section (page 100) but rather simpler, time-keeping, feel generating patterns such as those mentioned. Gerischer's other data produced similar results.

Bodies in Motion

Finally, note that each instrument's average timing values and corresponding lines vary in very similar fashion through the theoretical one bar cycle (in fact they are average values taken from 20 to 30 seconds of recorded material. (Gerischer 2006)) This suggests that the patterns played and the instruments on which they are played affects the timing. Likewise, so would the bodies (and minds) of the people who play them. These ideas indicate Toro's emphasis on the concept of motion as the cornerstone of his theoretical and practical philosophies. It also harks back to the observations of early ethnomusicologist Erich von Hornbostel, that African music proceeds from motion, as discussed by Blacking (Blacking 1955).

Indeed, closer to the material at hand, Gerischer's informant Tustão observes:

I think it also generates *suingue* when you liberate your body. You don't play only with your hands but with your body. Playing is a form of liberating one's body. If you do it, you will learn to swing. If you dance, you understand the rhythm. Rhythm is a context thing. When you play, you understand everything around it. It's a very broad thing, this *suingue*. If you want to learn Bahian rhythms, you have to go there, walk there, understand the people and then you will learn what you want to learn, because *suingue* is experience and living (Gerischer 2006, 102).

Toro would also argue that the feel in question is not obtainable by conceptual models; it is something that must be listened to, played and absorbed. To portray two rhythmic ideas simultaneously is at the core of the harmonic concept, but the ambiguity seems to extend beyond the mere execution of two perfectly performed metric references. To refer to many ideas, concepts or archetypes without clear preference for either is a feature of many artistic disciplines, for it is on this liminal ground that perception is freed from a linear, analytic approach, the mind forced to reconcile not

with *an answer* but with simultaneous layers of meaning. In the words of Gerischer's Brazilian informant Tustão again:

The *suingue* is the precision of the preciseness, it is a crazy thing, because it's an oscillation between the almost correct. It doesn't work exactly correctly; for example, if you use a drum machine it would be hard. The *suingue* is exactly that oscillation, which is neither wrong nor exactly correct...A percussionist uses false notes or leaves things out to create silences, and works out the form that way. He's not entirely precise (i.e., metronomic), because everywhere in music there is a lot of personal interpretation, which makes this nuance, such that you feel this small oscillation, that makes you dance, that you don't stay still. This is called *suingue*, the swing is this oscillation within a rhythm. (Gerischer 2006, 103)

And from Gerischer herself:

Though the microrhythmic phenomena described here seem to be based on an underlying microrhythmic structure, and seem significantly regular, one should not forget that all the phenomena depicted are tendencies in the time-relations of a performance. There are neither regular exact values, nor exact repetitions of the given periods of time. The articulations vary from cycle to cycle and also between musicians and groups. Musicians, in my conversations with them, repeatedly stressed the abundance of playful variations of familiar patterns, and the importance of distinctive interpretations by individuals and bands within various styles. Though microrhythmic phenomena occur with regularity and seem to be crucial to the rhythmic feeling and drive, they do not have the precision implied in the equidistant time-values of standard notation (Gerischer 2006, 110–11)

When Prescriptions Don't Work, the Power of Suggestion

Thus Toro's multi-dimensional perspective regarding Brazilian feel can be seen as a pedagogical crutch, a signpost, or the suggestion of a different paradigm for the understanding of the phenomenon. It does offer a relatively accurate starting point from which to understand and interpret the feel concept. It is not a precise prescription, and, if it were, and if it were popular enough, the music would surely evolve new levels of complexity in response. Perhaps we are only now attempting to analyse these micro-rhythmic phenomena after many generations of such an evolutionary process toward ever greater complexity.

Afro-Caribbean Feel

Toro's concept of Afro-Caribbean feel—that of the folkloric music of Cuba and Puerto Rico especially—is likewise based on the interaction of binary and ternary subdivisions. In this case, however, he says that it is interaction of the first two triplet partials with the offbeat sixteenth notes that describes the characteristic feel:

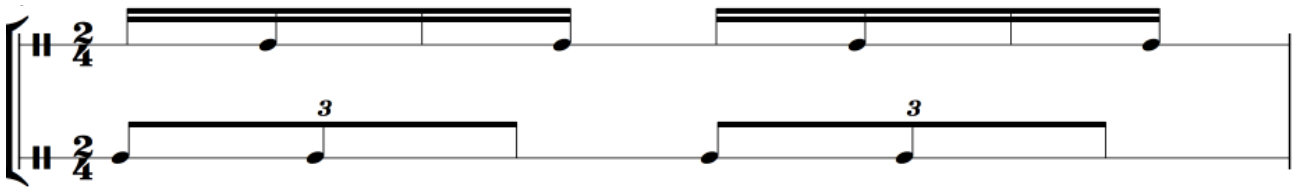


Figure 69. Toro's Afro-Caribbean Feel Formula.



Audio Example 36. Computer Generated Afro-Caribbean Feel Formula (CD Track 36).

To Cuba...Almost

In order to test this model, I first turned the work of Olavo Alén, (Alén 1995) who did timing measurements on *Tumba Francesa* rhythms in the regions of Santiago de Cuba and Guantanamo in the Eastern part of Cuba. However, as he did not include his raw data in the published paper, and since he worked primarily in rhythms conceptualized in a ternary metre⁷¹, I decided to produce data of my own. I used the introduction of a recording of Los Muñequitos de Matanzas, called “Oyelo de Nuevo.” (Los Muñequitos de Matanzas 1994) My reasons for this are the following: 1) When talking of Afro-Caribbean feel (Toro's preferred terminology, though many would say Afro-Cuban), the music of Cuba has been at the heart of that broadly inclusive traditional landscape, both historically, and stylistically; 2) the Cuban *Rumba* is widely considered one of the most influential genres in Afro-Caribbean folkloric music and popular music; 3) the *Rumba* is characterized as having an 'in the cracks' feel; (Hernandez 2000; Toro 1993a; Peñalosa and Greenwood 2009; Goines and Ameen 1993) 4) Los Muñequitos has been one of the premier recording *Rumba* groups since their debut in 1956; 4) the beginning of a *Rumba* often includes the three conga (in Spanish, *tumbadora*) players demonstrating the sixteenth note feel in unison with a rocking, 'heel-toe' motion of the hands; this introduction is not obligatory but seems to be a call to group acknowledgement of the underlying feel before the separation into the several parts that fit together rhythmically to create, with vocals

⁷¹ The formula in question applies to a binary feel, but others have shown various ternary feels to also be non-isochronous. (Polak 2010; Alén 1995; Benadon 2006; Bengston 1977)

and other small percussion instruments, the overall *Rumba* sound. Such is the case with the beginning of “Oyelo de Nuevo⁷².” This rocking sixteenth motion is reminiscent of the way Toro showed the feel to me, as well as my own experiences with folkloric Rumba from the early 1990s onward; it is the basis of the *segundo*, or middle drum, accompaniment in the Matanzas style.

As Cuban *Rumba* was not the primary focus of this study, it was not feasible to travel to Cuba or some other location where an 'authentic' *Rumba* group could be found. Such a recording would make for a larger data sample, more easily processed through multi-track recordings, with different input from each instrument. Nevertheless, I was able to gather timing data on the basic feel as indicated by the players in their introduction. It should be clear from the aforementioned discussions that it is not my objective to 'prove' Toro's theory about feel, for the theory itself is built on the *a priori* assumption that human musical activity is by its very nature *not* in conformance to certain qualitative parameters; it is, in Toro's view, imperfect, like nature. (“But nature doesn't happen by subdivision.” (Toro 2012j)) My intention here is to evaluate his archetypal model in light of some sample material to see what observations this process might generate.

Data Collection and Analysis

I imported the recording into the Pro Tools platform, and, using a combination of listening, knowledge of the music, and visual waveform data, put markers at each subdivision as articulated in the introductory section described above. I then exported the timing data, with the marker names (Clave 2, Beat 1.2, etc.) and put it into a spreadsheet where I calculated subdivision and cumulative timings as with the Brazilian data. I chose to work this time in percentages, rather than NUTs, similar to approach taken by Polak. (Polak 2010) In this way, the articulations can be compared as percentages of the total beat, both for individual subdivision length or cumulative position within the beat, rather than fractions of 400 NUTs. The data remained in millisecond accuracy, up to the calculations of percentages.

The length of the extract was about 10 seconds, or about five clave cycles, until the entrance of the voices and separate drum parts would make determination of individual subdivision strikes impossible.

⁷² This approach is similar to that of Polak, who, working with *Jembe* players in Mali, used the '*echauffement*' ('heating up') section of the soloists' performances to gather and hypothesize about timing data. This section likewise consists of all main beats and subdivisions played throughout several iterations of the metric cycle. (Polak 2010)

As with the Brazilian data, I found that the Afro-Caribbean harmonic timing model seemed to offer the right shape, but with extremes of timing variation that act more like points of gravity, competing with the gravity of even sixteenth timing.

Los Munequitos Intro Marcha Average Timing of Subdivisions, per Beat

From Recording, Oyelo de Nuevo (1989)

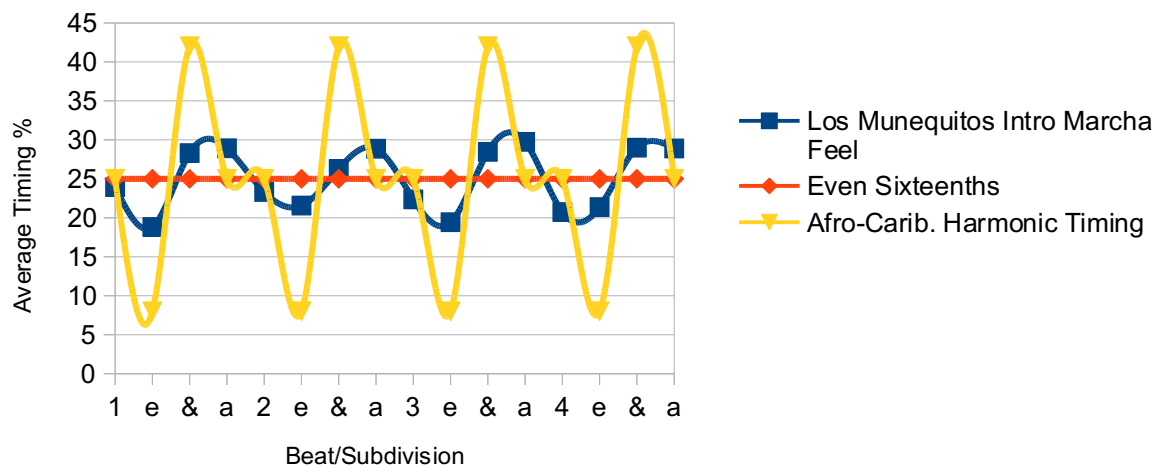


Figure 70. Los Muñequitos Intro *Marcha*, Average Timing.

I think it is reasonable to assume that even sixteenth timing is the conceptual model offering the backdrop from which the performers operate, but that it is warped by the ternary pull. This is likely a result of the performers' experience with more clearly ternary-based music, whether the influence is motional, aural, or a combination of the two. Much Afro-Cuban folkloric music, both sacred and secular, operates from a primarily ternary feel, as do its West African root styles. Although not usually cited as a direct root of Cuban music, of the Mandeng *jembe* rhythms discussed earlier, in Keita's and Billmeier's choice of 62 rhythms 61% were presented and transcribed in a ternary feel. In my personal experience with Congolese folkloric, and Yoruba Dundun drumming, both cited as primary influences on the music of Cuba, (Malabe and Weiner 1990; Hernandez 2000; Peñalosa and Greenwood 2009; Mauleón 2011) there was also an approximately even split between binary and ternary feels.

Similar in Conception, Slightly Different in Execution

But are these just wobbles in the accuracy of the timing or do they confirm the influence of the harmonic conception according to Toro's model? Other research of this sort indicates that, although there are clear individual and stylistic differences, the patterns of variation from the mechanical norm demonstrated regularity and by extension, intentionality. (Polak 2010; Gerischer 2006; Alén

1995; Benadon 2006; Bengston 1977) Likewise the data presented in this study has also shown each beat to have similar patterns of variability about the mid-line representing mechanical or metronomic timing. As for the relevance of Toro's models, I decided to compare the two to decide if there appears to be a better fit between each model and the data from its relevant culture area.

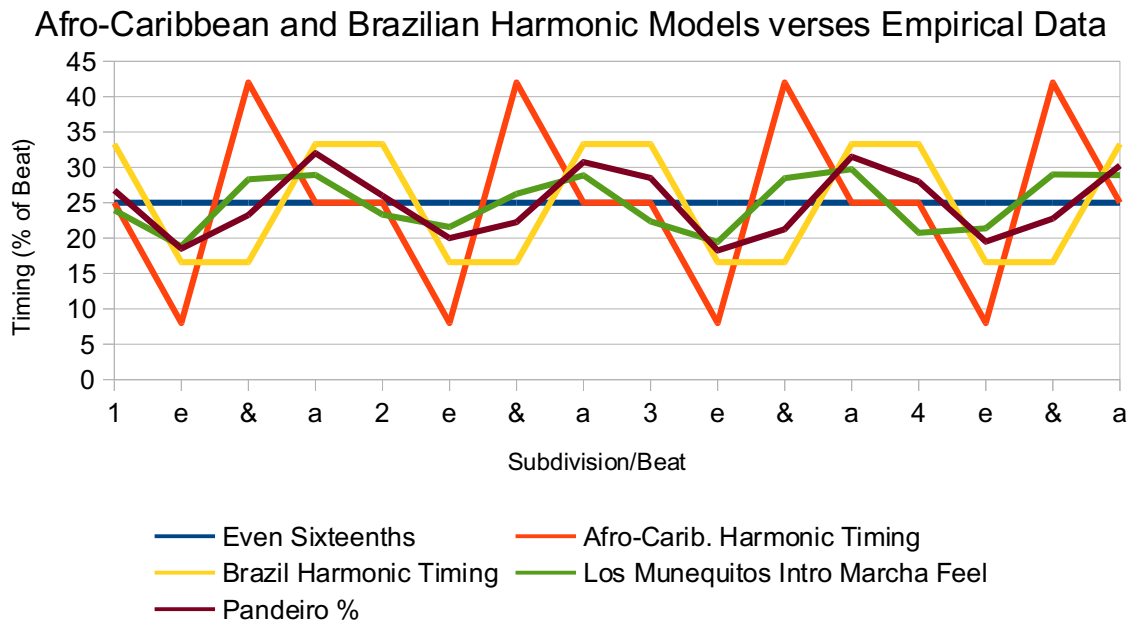
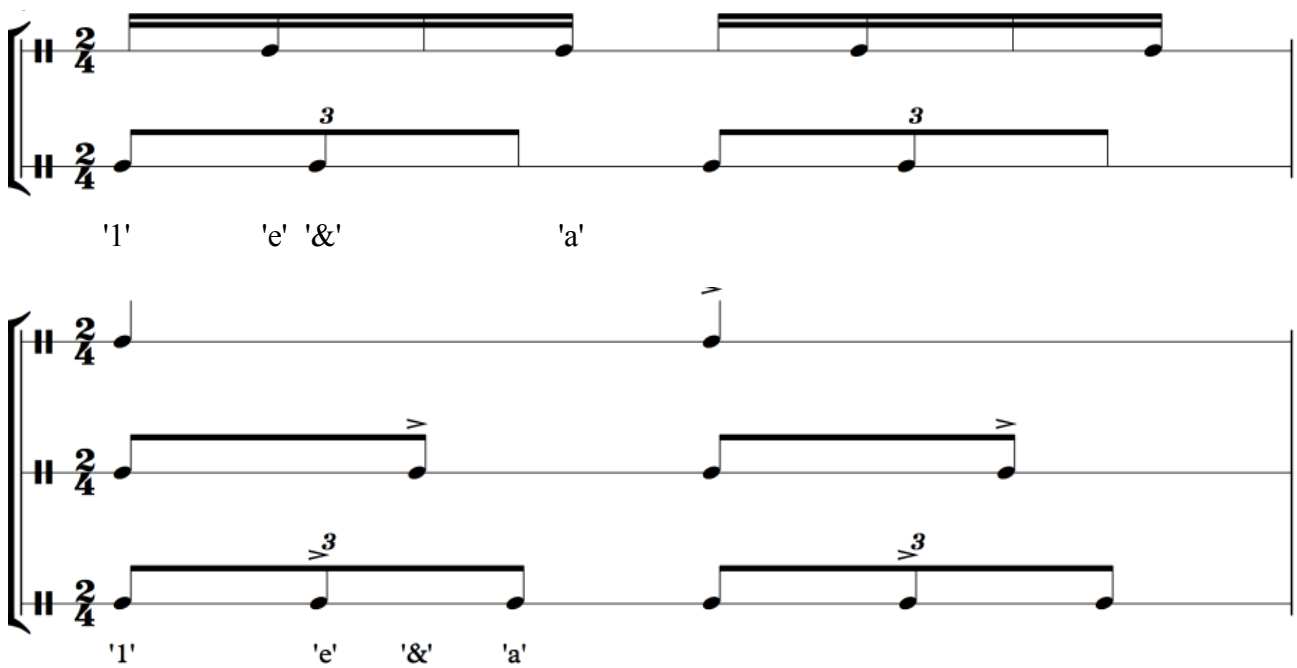


Figure 71. Harmonic Models and Empirical Data.

Although difficult to take in at first, by looking at the lines in pairs—red and green, yellow and puce—it is clear that the data and the models match in relative shape. That is, the highs and lows occur in nearly the same positions on the horizontal axis. Interestingly, the data lines—Los Munequitos and *pandeiro* (green and puce)—also match quite well; better, in fact than either does with its relevant model. Each shows short durations on the second subdivision ('e'), as do both models, and longer durations for the last subdivision ('a'), as does the Brazilian model. They differ, however, for durations of the first, and especially the third ('&'). This third position is where the models are also farthest apart in their predictions, well above and below the middle line. Examining them once again, it appears that indeed the Afro-Caribbean model has a very long middle subdivision, more than 33%⁷³, a whole triplet partial, and the Brazilian model, conversely, a very short one:

⁷³ In fact it is 42%, the difference between the 33% of the second triplet subdivision and 75% of the last sixteenth.



Figures 72 and 73. Afro-Caribbean and Afro-Brazilian Harmonic Models Reference.

Looking at the cumulative timing values, as before, we see a similar trend:

Los Munequitos and Pandeiro Average Timing Values-Cumulative per Beat

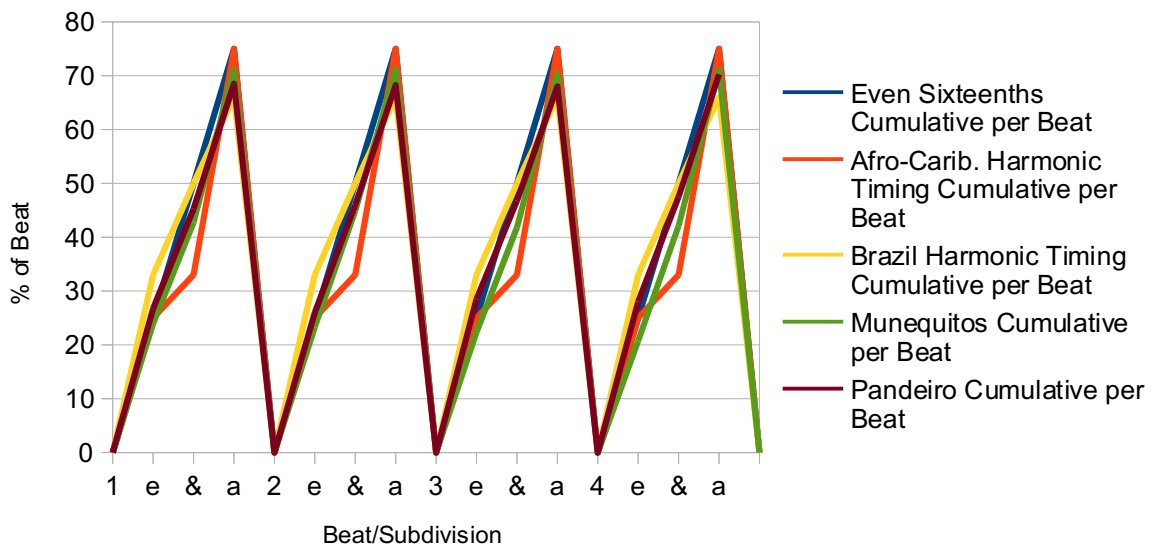


Figure 74. Cumulative Average Timing Values Comparison.

Here, from another perspective, it can be seen that the data lines—green and puce—are similar in form but that where separate, each is nearer to its respective model—green near red and puce near yellow. Also, both data lines peak considerably below the 75% mark; each one has a short subdivision earlier in the beat which pulls everything back and leaves a gap at the end which manifests as a

long, near triplet last subdivision. Looking at figure 7.70 again and comparing to the middle, mechanical timing line, we see that both sets of data have near sixteenth note first subdivisions, relatively short second subdivisions, as both models predict, relatively long and short third subdivisions for the Afro-Caribbean and Brazilian lines, respectively, as the models predict, and relatively long last subdivisions for both, as one of the models predicts. Though the Afro-Caribbean model predicts even timing for the last subdivision and the data showed they were longer, the Brazilian data showed still longer final subdivisions—more toward its model.

The Ears Have It

What all this means to me is that Toro's ears and his intuition are relatively correct. The data sets are too small to make grand pronouncements about the nature of these two rhythmic feels, from these two large culture areas. Likewise, the variability is such that I have avoided statistically powerful terminology like 'correlation', and 'degrees of certainty'. In fact, Toro's conception is so broad, and flexible, it is hard or impossible to evaluate 'scientifically'. However, I still find it significant because we are concerned not with *exactness* but with *perspective*. When approaching a new or 'slippery' feel then, these two models, or others developed by other theorists and/or performers for other feels, can indeed offer a foothold or a foundation from which to explore the more particular nuances. This 'nuance level' of comprehension will always be grasped by the finer capacity of the senses (or the computer, through recording and data analysis).

From this framework will our understanding be richer? Our potential more? Although a basic poly-metric grid will never approach the detailed interpretation possible to a sensitive aural specialist (as we all are, to some degree), conceptual engagement might also help and encourage us to preserve what might otherwise be lost in a world increasingly predominated by a linear aesthetic.

The sound of music is unique to that culture and it is perceived in the 4 and 6 frequencies because 2 and 3 are too big. Here is where all the cultures make their own sound. For practical purposes the space between 4 and 6, how close or how loose they are played in the specific style of music, defines its sound.

Ethnic musicians don't know what they are doing. They do it because they grew up doing it but they don't have a point of view about what they are doing.

If you don't know what you do then you can only play the patterns you've learned!

This is the way we all learned things and once in a while there is (a) Picasso, Einstein, Feynman, Debussy but one in a million... because they know what's happening they can play around with it. (Toro 2011b)

Linear Modalities

And what about the linear conception? What about those musics of the world that feature one rhythmic line, with or without a highly inflected feel? Perhaps the most complex, most complete rhythmic system in the world comes to us from India, as we have already seen. But rhythmically intricate though it is, Indian music is delivered linearly. Does the harmonic perspective of rhythm apply?

The (hypothetical) answer is yes. In Toro's words, "Indian music is a linear delivery of a harmonic approach." (Toro 2011c)

I had known this for a long time already, in some sense. Through classes, conversations with other musicians and my own listening experiences, I knew Indian music to be fast, intricate, full of 'odd' metres and long phrases that cross the metric structure. I also knew African music used only some of the vast rhythmic palette of India but with a difference: In Africa it happened at the same time.

But, before embarking on this study I was not thinking about the harmonic series, or about the relationships between all the various dimensions tapped by Indian music. Indian music, with respect to the various metric schemes explored by the tala system, is in touch with the harmonic conception of rhythm, even if the different metres are not rendered simultaneously. What is more, if we consider that the *tala*, which is usually rendered by the ostinato of a non-solo instrument, and/or counted with hand claps, finger taps and waves by the audience or other performers, forms the metric backdrop against which so many variations and metric modulations are performed, then, in a sense, this music is also rhythmically harmonic.

But the purpose of this discussion is not to discuss Indian music on its own, it is rather to investigate some of the ways in which the harmonic perspective of rhythm might inform the linear concept of musicians from any tradition.

Three Steps to Freedom

Toro said on many, many occasions that his method and message is simple and that it is all based on downbeat, upbeat, and dotted note. According to him, these three things allow one to 'play.' By play, he means to feel free and to make phrases which may or may not agree with the metric structure but never to be lost, or to lose connection with that structure. To qualify his statement, I might phrase it thus: Within a certain metre, a solid grounding in downbeats, upbeats and dotted notes allows a musician to be rhythmically adventurous without guessing. Incidentally, the harmonic relationship of two and three and their 'octave' derivatives are also to be reckoned with in this approach. But how does this work?

The Power of Motion

At the foundation of the approach is motion. According to Toro, a musical motion is comprised of complementary down and up phases. By playing this way, working with gravity, the musician benefits by: using less effort to get a bigger sound; playing faster by getting two or more articulations per stroke; producing a more musical sound, that is, more intentional and more 'natural', being comprised of complementary elements, and sounding like a body in motion, rather than a machine or computer⁷⁴. The conscious development of this approach also facilitates the parallel development of awareness—of bodily sensations, of sound, of being connected to or engaged in the process of playing an instrument, etc. While discussing these concepts with Toro, I mentioned some lessons with my old composition teacher, Dr. Paul Renan, himself an excellent pianist and advocate of the Alexander Technique. (Renan 2002) I had related Renan's words about feeling an internal circular motion in the arms while playing:

ET: Of course. It's the motion. Only a few people know about that. All the other ones are stuck, and they have no clue. It is the basis. Because when you do this it releases. It releases the energy, and stress.

JD: Like Tai Chi.

ET: Well yeah it is Tai Chi. Everyone that discovers this in different parts of the world calls it whatever they want. And it's the same idea of Joseph Campbell and Jung of the basic and the cultural. The basic is this motion. Mechanical. Correct mechanical motions. And if its discovered in some...place they call it...call it whatever you want. It's just the right motion.

JD: Moeller, Alexander...

ET: It's just the right motion. Look at how a wave does. Just look at the ocean. It's what happens. Some humans are hip to things. Some humans are not. I could be hip to a musical idea. I might not be hip to some other idea. It doesn't mean that because you're sensitive to music you're sensitive to everything else. People can walk. I've taught people who have no musical ability, and they can't play in time, but they want to play a drum. What do you do? Well, I say to that person, 'Walk.' See people walking. You can walk in time. People walk in time. If you didn't walk in time, you'd be out of breath. So, think of your walking. And play with just the same timing, as you do your walking. It's a great connection. You walk. If you can walk, you can play! That you are disconnected from that event, I understand. But think of it, clearly. Put it in your conscious mind, of walking in time. And play...with the same idea...

JD: So you can play almost any speed without getting tired?

⁷⁴ Whether computers and machines are 'musical' is another discussion. Assuming that music is a human phenomenon, is it not the human-ness with which the machines are directed that makes noise into music? I do not wish to draw the wrath of any computer music advocates, but I have left the statement as is under the assumption we are talking about instruments where a significant component of the sound production and micro-rhythmic placement is generated by human movement.

ET: That's the idea. But the main idea is that it produces a musical motion. The other one doesn't produce a musical motion, because musical motion comes from the irregular or oval cycle.

JD: Yeah. It's like there's a resting phase and then almost a point.

ET: There's gravity and no gravity. (Repeats) And that's a downbeat and the offbeat. If the offbeat had gravity it would be an on-beat. (JD laughs) Of course. The offbeat doesn't have gravity. An orbit doesn't have gravity until those points, and then it does this kinda stuff (snaps hand downward).

JD: It accelerates away and then gravity grabs it and says, 'come back.'

ET: That's right. And that's the truth of nature. But we can avoid that like this. (Plays stiffly with pointed finger— Downbeat, downbeat, downbeat, without upbeats.) (Toro 2012a)

He also draws analogies to other human endeavours, such as throwing or hitting a ball, and touches on the need not only to produce a natural motion, but to surrender to that motion, as a surfer to the wave. In a sense, from this perspective, the correct motion is not 'produced', it already is.

ET: The idea of the downbeat and the offbeat, it's what creates music. So that motion is important if you're playing an instrument for musical purposes. Otherwise, I think it's the right motion because it's the right motion you can see. When you walk or when you throw a ball correctly or whatever...it's the motion of a wave. It just makes sense.

JD: No wonder you like surfing...to be with the waves.

ET: Yeah, it's really interesting if you can get hip enough to be with the wave to see how it moves. If you've seen in my videos of surfing, I go with the wave. It's difficult as sometimes you want to carve the wave. If it's not good it throws you off, like a horse or something. But when you can feel the contour and where the wave wants to go, it's an amazing feeling...just like music. So I realized many, many years ago that music is a monster that develops and if you're sensitive to it you let the music carry you. When you do that then you're at a different level of playing. So the music dictates what you should play. So there's this motion. Once you get the motion, it becomes effortless. The Hindus have discovered that. (Demonstrates, dropping hands in front) (Toro 2012a)

Toro's method advocates the consistent development and reinforcement of this correct down-up motion, in the weak hand, while adding other motions in another limb, in gradually more difficult relationships. This is the approach in his book, *For Your Hands Only*.

So the basis of what I'm talking about is in that book, *For Your Hands Only*. That is a book for anyone. For any instrumentalist. It has nothing to do with percussion. Except it's written in the language of a conga drum. It's just the most accessible thing. You can do it on your lap. So it's the idea of becoming aware of the downbeat and the offbeat feel. And being able to feel that within you.

So, without losing the feeling for the downbeat, you accent the offbeat. See? It has a different effect. And then, all of them. And then in between. What I'm trying to accomplish with this is to get a feeling of the pulse. Getting a really grounded feeling of the pulse without using your strong hand to do that, but using your weak side to have that feeling of ground. Your weak side. And that kind of balances you out from this (shows one hand forward like

drummer's ride) to this (puts both hands out). So that's the whole idea...and then the dotted notes. And when I did that I noticed that if I didn't count I would get lost. And I asked myself why. Because every time it goes to the offbeat and comes back to the downbeat, it seems like one. And it's not one. It takes three patterns to get to one. (Toro 2012a)

The beginning of that book then, shows an ostinato like this. Note the down and up, as indicated by note height:



Over which these other motions are practiced:

Figures 75 and 76. For Your Hands Only First Exercises. Date



Audio Example 37. For Your Hands Only, First Exercise (CD Track 37).

Motion in Another Tempo: The Dotted Note

As suggested above, each line/combination deserves significant, engaged repetition, with the aim of developing and deepening the grounded, motional concept. Toro then gives his six basic versions of the dotted note, which are combined with the same ostinato:

Figure 77. The Dotted Note Applications.

I have listed them in the order I am accustomed to practicing and remembering them, labelled in Toro's way⁷⁵. Here is the same with all subdivisions indicated:

Figure 78. The Dotted Notes with All Subdivisions Indicated.

⁷⁵ Toro seems to order them according to the first position of the double articulation, i.e.: 1) from the downbeat; 2) to the downbeat; 3) to the offbeat; 4) from the offbeat; 5) all combinations in succession. I prefer to think of them as: double-single starting from the downbeat; double-single starting after the downbeat; single-double starting on the downbeat; single-double starting after the downbeat; double-double with a space between. Each combination cycles through several positions with regard to the sixteenth note, 2/4 cycle, so names are a personal preference.



Audio Example 38. For Your Hands Only, Eighth Notes with Groups of Three (CD Track 38).

Though I have practiced these ideas for many hours and find them to greatly enhance my concept and playing, I still struggle with all-encompassing pronouncements, such as, 'That's all there is,' or, 'Everything you'll ever play is that.' Greatly impressed by Toro's abilities and commitment to his version of the nature of rhythm, however, I feel compelled to explain the paramount importance this material may hold for the development of a new type of musicianship. This explanation is an important intention of this thesis.

A New Vision

At the foundation of the envisioned perspective on rhythm, I see three fundamental characteristics: 1) The capacity for one person to present a highly multi-dimensional rhythmic framework, as is normally heard in various, especially African Diaspora AT/Music traditions; 2) The capacity to also play complex, linear combinations, in the manner of especially Indian Classical music; 3) To work at this level with a high degree of analytical, conscious understanding of what one is doing, hence the ability to always vary the possibilities, not only play from one's tradition. Toro often referred to doing 'rhythm,' (from/open to all that is possible) as opposed to 'music,' (from certain traditions) and I believe this summary approximates his intention:

And so, the Hindus have thought of rhythm in a fundamental way. They've studied this stuff, and...but their interpretation of it is linear. You see? Where the Africans' is harmonic. And so why not mix both? And the Hindus, you know, Swapn (Swapn Chaudhuri, *tabla* guru, who gave Toro several *tabla* lessons) didn't want to hear about that. And so, it's that kind of stuff. The mixture of both is best! Really, to be able to...and in *tablas*, I can do both things. I can do this linear thing, and I can do this harmonic thing. This is the next step. But, you know, this idea, it's beyond intuitive because this (the harmonic series) is intuition. And the Hindus, not intuition! It's learning. And the combination of both philosophies is the best! One is not better than the other. Those together is the best. You know? And so we're missing that. We're missing that completely, and that's where I'm at. This (the downbeats, upbeats, and dotted note) is a Hindu idea, on a harmonic basis. And I saw that. I saw that immediately. It's quite simple. Downbeat and upbeat and dotted note. It (dotted note) doesn't exist, but here (two and three in harmonic series), this is the same thing! (Toro 2012n)

Most people just copy one dimensional patterns. Or they get it but don't understand. In the modern world, you need both. You need to do it and you need to understand what it is. (Toro 2012h)

At the foundation of that foundation, then, are skills that, in Toro's view, are best developed through something like the aforementioned method. If the downbeat and upbeat are absolutely solid, grounded and thoroughly assimilated in the player's body, the next step is something that challenges and therefore strengthens that centred-ness. The first series of exercises goes 'against' and all around

the downbeat at the beat-specific level. The next series, those involving the dotted note, do so at a cycle-specific level, or rather, the level of several cycles. To fully digest the dotted note involves going 'in' to it and being able to 'look' back at the downbeat/upbeat cycle, and vice versa. This is the foundational exercise for developing a multi-dimensional awareness. But why the dotted note specifically?

Into the Dot: Playing with Perspective

A dotted note figure does not rest in the downbeat or upbeat, but alternates from one to the other, all the while moving its placement within the larger metric cycle. In the exercises above, if we take the last line we see that with respect to the quarter note, the articulations occur from the downbeat, to the next beat, from the offbeat, then to the next offbeat, before repeating. The repetition occurs however, in the middle of the second bar, so that sequence has to be repeated to come back to the proper, 'downbeat', or the 'one.' But the goal is to internalize this movement, not as a pattern or a counting exercise, but as its own entity, and especially, with *its own motion*, and, ultimately, its own perspective from which the player may choose to view its interaction with the downbeat/upbeat cycle⁷⁶.

One must be able to hear either as the base and either as the complement. From the dotted note point of view, then, we have this (note the bottom line is the dotted note):

Figure 79. The Dotted Point of View, with Eighth Notes (Downs and Ups) in *Two*.



Audio Example 39. Dotted Point of View 1 (CD Track 39).

This is four dotted notes to one and a half down-up cycles, thus it needs two bars to complete. Seen another way, it is four with three:

⁷⁶ Note I am using the terms 'down beat' here, as Toro often did, to indicate strokes with a down motion, usually this also means just on the beat. This is not to be confused with the conventional meaning of downbeat as the first beat of the bar.

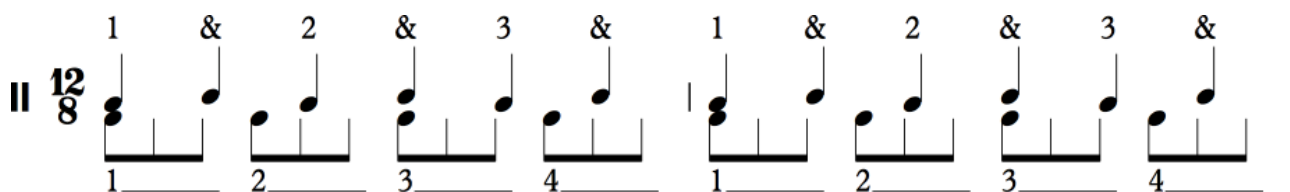


Figure 80. The Dotted Point of View, with Eighth Notes in *Three*.

Here the cycle repeats in one, 12/8 bar, but the top line, and any normal phrase within it, is actually in two, as in the previous figure. The repetition is heard but the two artificial 'metres' don't align until two bars have passed, as above. Here is yet another interpretation:

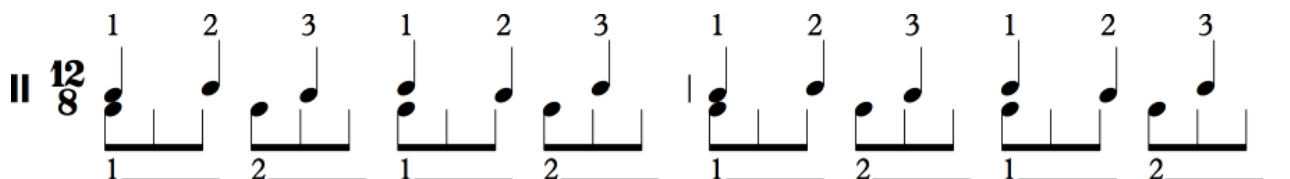


Figure 81. The Dotted Point of View as *Three* and *Two*.



Audio Example 40. Dotted Points of View 2 and 3 (CD Track 40).

This time we see the same figure organized as three with two. The pattern of repetition, down or up motion notwithstanding, is now one and a half original beats (top line) to two dotted notes. But, as always, we must not give in completely to either perspective. These relationships are heard and receive partial focus but without losing the overall cycle of repetition: As seen here in two bars of 12/8, or originally in three bars of 2/4. The cultivation of this multi-dimensional, multi-cycle awareness is the power of the dotted note. It is the same two with three seen throughout this chapter, but the three is a regrouping of a binary structure. Thus, the whole picture and our awareness is 'turned on its head.'

Because the dotted note introduces a factor of three, we always end up with threes and twos in various relationships. As Toro put it:

ET...by going back to three and two. Of course...You can hear *two* as a dotted note from *three* and you can hear *three* as a triplet from *two*. It's just a perspective. What's the relationship between one and another? Just down beats and upbeats. Gggghh (exasperated sound). Very simple. But it's so heavy, it's difficult to see. When I saw the downbeat and upbeat and what it did, and coordination...one thing led to the other, but very fast. It makes a lot of sense. And it's so simple. It's really ridiculously simple. But you must have a point of view. You must understand it.

JD: You have the experience.

ET: Yeah. You have the experience. (Toro 2012a)

Toward What End?

For Your Hands Only goes on to work the same material against a sixteenth note ostinato, then works from ternary ostinatos of triplets and sextuplets and puts binary ideas with those. It then moves into a practical section where various Afro-Caribbean and Afro-Brazilian foundational patterns are put through a similar process—they act as ostinatos while the downbeat and upbeat combinations and then the dotted note combinations are learned with them. Finally, the 'standard pattern' that we saw previously is the repertoire derived, ternary ostinato that is combined with ternary and binary patterns. All of this is meant to be useful for the development of a multi-dimensional, primarily 'Latin' musical approach, but also as a model that can be used with any motivic idea against which one wants to learn to improvise freely, within the barline/metric cycle and beyond. Toro gave me an insight into this as an epiphanic process in his own development:

At the beginning, it would take me two or three weeks to get an exercise. One day I came out and it took me only a few minutes and I said, 'I got it.' I saw that in the motion of the down beat and the offbeat. I saw that it was the key to coordination. I saw it was the key to the whole thing. And of perspective. The dotted note that I was practicing became very clear. Because it's a down beat followed by an offbeat. Instead of down beat, down beat or offbeat, offbeat. It's down beat, offbeat, down beat, offbeat. And it became really clear. Any way you look at it it's the same thing. It's a down beat and an offbeat a third faster, or a third slower. Or just a down beat or an offbeat. And I couldn't believe it. I said it can't be that easy! It is that easy. And I went to the drum set right after that. And I said if this works, it must work with things that I can't play, like *five*. I'd never been able to play in *five*, in my life. So, I sat down to practice *five*. I thought of "Mission Impossible," because that pattern's very popular⁷⁷. I didn't know the implications of that pattern. I did it with my feet, simply. Something like (see below) and I applied the same idea.

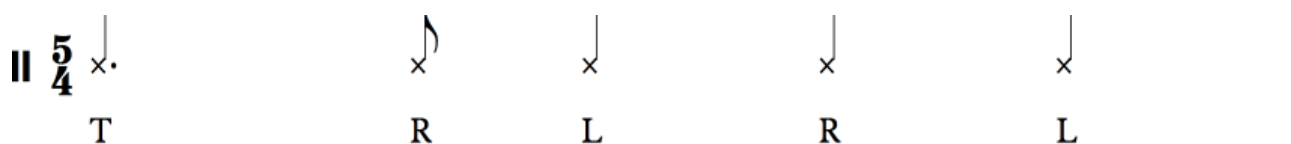


Figure 82. "Mission Impossible" Feet Ostinato.

I did down beats and I went (claps the *five*)...that felt comfortable. Then I did offbeat, both hands (shows), and I went 'Wow. This is great.' Then I tried dotted notes, and I kind of stumbled, a little bit. But in five minutes or maybe a little more, I went through. I went (demonstrates) and I got it! Then I tried something (plays doubles on dotted note-skipping pattern; fifth dotted pattern above (figure 7.77) and I could do that! Then I started playing things that I knew and I could do it. Then in about ten, fifteen minutes, I'm playing in *five*. I said, 'My god.' (Toro 2012a)

This is an example of a transformative process at work. Here Toro seems to be jumping the language analogy so appropriate to learning in a traditional and/or intuitive fashion. That is, instead of

⁷⁷ The theme from the popular television and movie series, composed by Lalo Schiffrin.

taking many, many patterns—by example or intuition—and working them out one by one, as we all did learning our mother tongues, he is working out archetypal, structural patterns. By forming a deep experience of their aural and kinaesthetic essences, he was able to see how they are the basis of much, much more. Once the background work is done, of course, much of the repertoire for the background ostinato or foreground contrasting pattern might come from learned and heard examples, as with early language formation, but the number of examples required to achieve (interdependent) mastery is relatively few.

Manifesting the Vision

And what intrinsic value does the product of this sort of work have? The conception and presentation of a multi-dimensional rhythmic soundscape...and the freedom to be very inventive within it, without getting lost. This multi-dimensionality arises not only from intellectual constructs, but from movement. It is supported by a clear, internal, multi-dimensional grid of time. And again, it is present in one person, not dependent on a group experience.

But they (Indian classical musicians) don't know the implications of what they are saying. You know? They don't know that. But, the Hindus discovered with the dotted note, it opens up the thing. They don't know why, it just does it. And I discovered the same thing...that all you need to do is just play the dotted note. But the dotted note must have its own motion. It's not a subdivision of this. (Plays briefly) It has its own motion. It has its own thing. And once you can do it, you can gravitate towards it just by letting yourself go to it. And that becomes metric modulation. But, in my idea, my concept, you don't lose one. If you lose one then you're lost. You see? And that's why what you want to develop more and more and more is the feeling of down beats and upbeats. That's where your gravity is. And that's your point of view. And that's Einstein. With a point of view, and before Einstein, with a point of view, you can measure things. You know Newton was there. You have a point. A planet or a star. And so that's your point of measure. How do you know that an orbit's elliptical if you don't have a point of view from somewhere? Where would you start measuring? So, the concept is to have that point of view very, very, very clear. (Toro 2012a)

Toro is clear, however, that this perspective is not essential to be a good or working musician. Rather, it is a new frontier, rooted in the experience of the various, centuries old AT/Music traditions.

That doesn't mean that people that have (a) point of view very clear can play. I can mention many drummers that have (a) very clear groove and point of view but they can't play around it. That's not their interest. Their interest is just to play the one. And that's ok. But if you want to do more, then you must develop a (larger) point of view. And a point of view is to go from that, and what we do in the western world is to learn patterns...and pattern and pattern and patterns...you haven't done anything! Because if you work out the downbeat and the offbeat and the dotted note, it gives you a perspective, so that you can move on, or around with this perspective. And you apply (it) to anything you want to be proficient at, or be able to play...or to play from, or to play with. If you don't want to develop that, you don't need to do that at all. All you need to do is to play patterns, and you'll play linearly correct. See? The thing about it is that all ethnic music is dimensional. And it's composed of different motions at the same time. That's why it sounds the way it does. If it didn't, you would put all the patterns into a drum machine and when they spit it out it would sound good. But

it doesn't! Why? Because everything has its own motion! And those are different times and that's Einstein. And that's the whole basis of the concept. (Toro 2012a)

Linear Freedom

Being very clear on the dotted note, downbeat and upbeats allows one to mix them up, of course.

This is what all patterns are made of—twos and threes—as mentioned elsewhere. Therefore, to play groupings of five in a binary rhythmic structure, we just think, dotted, non-dotted, dotted, non-dotted, etc.



Figure 83. Sixteenths in *Two*, Grouped in fives (dotted + non-dotted).



Audio Example 41. Linear Fives in *Two* (CD Track 41).

Now, we must suspend our need for resolution, and keep each motion on its own trajectory, for five measures instead of three.

To take a slightly more practical example, here is the *tresillo* on, presumably, one foot, and the *two* to a bar beat on the other (feet/ostinato stems pointing down), with 'down' eights in the hands (hands'/variable patterns' stems are pointing up). The limb/digit combinations are a matter of preference, but this is an obvious starting point. It should be easier to feel the motions of whole limbs versus fingers.



Figure 84. *Tresillo* and *Two*, with 'Downs'.

By learning it well, then proceeding to this, the upbeat motion,

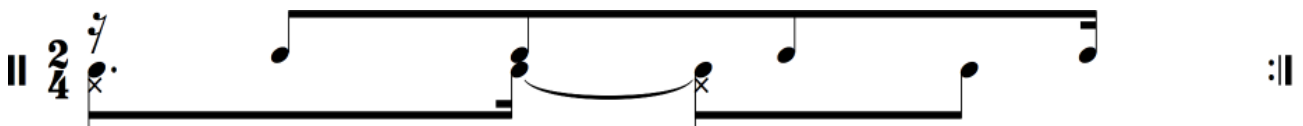


Figure 85. *Tresillo* and *Two* with 'Ups'.

and then, the dotted note motion,

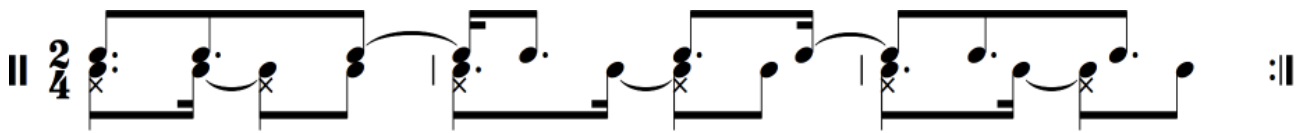


Figure 86. *Tresillo* and *Two* with Dotted Notes.

without a great deal more effort, one can progress to the pattern below: linear groups of seven with the same *tresillo*/two beat ostinato.

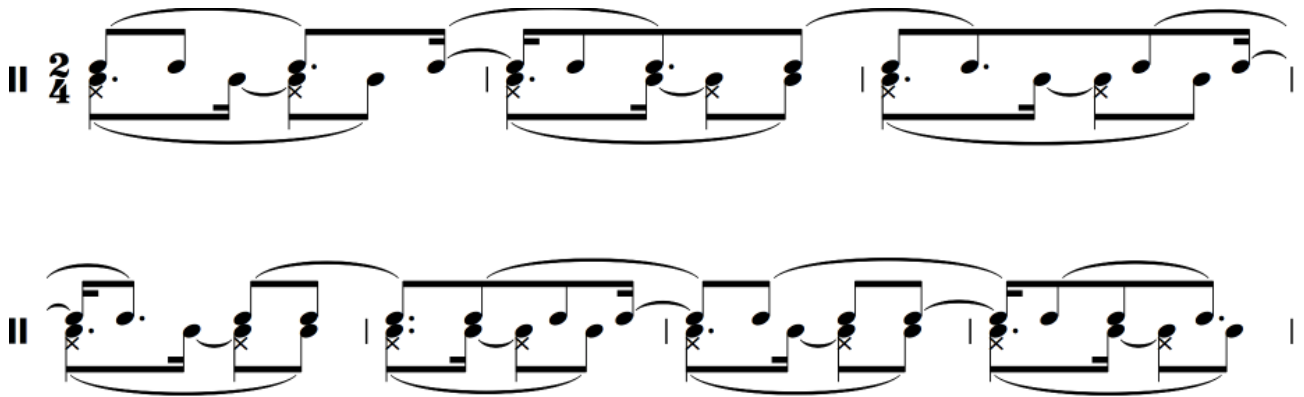


Figure 87. *Tresillo* and *Two* with Groups of Seven.



Audio Example 42. *Tresillo* Downs, Ups, Dotted, Linear Sevens (CD Track 42).

Incidentally, I learned this at my desk while writing, just to make sure I could 'walk the talk.' Having practiced the preliminary exercises before, it took just a minute or two to work it out. Then, after notating it, I tapped the seven with my finger, my foot keeping 'normal' time, my eyes on the notation. Then I realized I had left out the *tresillo*. I added that to my feet and then, I struggled. Perhaps my mind was distracted by the notation, I thought, then I realized I was not using motion; I was not consciously generating the different elements each with their own kinaesthetic sense, tied in the middle by a wider awareness. I was focused on the details. Once I regained the motional approach, it fell (happily) into place again. This is one of many experiences that for me points to the potential conflict between corporal (assumed in this case to be synonymous with 'natural') and intellectual understanding. Toro told me on several occasions that he sees no conflict.

“There’s no conflict between intellect and the natural world...at all! There’s no conflict! And intellect adds to the natural ability. Intellect it just doubles...it just doubles your understanding of what is natural, and it adds, it embellishes, it enhances the natural.” (Toro 2012m)

Nevertheless, I maintain that the potential is there. Even some of his observations seem to point to this but his vision is that these potentially separate aspects function in interdependent harmony. The

positive aspect of this gradually emerging realization is that, for me, the enabling mind state is very much akin to that used in meditation. It is an open, broad awareness, centred in the body, not in any one part or limb. I believe the implications of this realization go far beyond musicianship, into the realms of health, psychology, spirituality, neurobiology, perhaps even the elusive evolutionary basis for the development of music.

Toward Harmonic Freedom: Healing the Body/Mind Schism

This approach and perspective can also act a precursor to the harmonic perspective of rhythm discussed in other sections (“The Harmonic Perspective of Rhythm Revisited,” page 84; “Polymetre,” page 84; “The Harmonic Approach,” page 89). In playing linear combinations whose period of resolution extends well beyond the limits of one measure of the predominant metric cycle, we must reconcile divergent rhythmic trajectories. If we manage this with the body and mind simultaneously—with comprehension and motion—we have set the stage to begin working with multiple, simultaneous metric conceptions. Of course, as we have seen, the dotted note within a binary feel produces *two* with *three*, or *four* with *three*, in the larger cycle of resolution. This is akin to the linear approach of generating multiple metres discussed in the section called, “The Linear Approach” (page 88), where we examined the process and limitations of counting and regrouping subdivisions. However, with careful attention to the development and application of motion, the limitations of intellectual processing are distributed to the body. This is reminiscent of the physics/kinaesthetics/sports lesson challenging us to imagine how many calculations and re-calculations would be required for a baseball or cricket fielder to catch a fly ball, all in the second or so it takes from him/her seeing it leave the bat to its arrival in his/her hands. It is, literally and figuratively, 'mind-boggling'. It also brings to mind the observations of Robert Jourdain that, despite our notions to the contrary, the primary, evolutionary, purpose of the nervous system (including the brain) is movement.

One of nature's most basic facts is that animals have brains and plants don't. Animals need brains, and much more, because they gather energy by searching for things to eat; plants just lie around sunbathing all day. There's no point in evolving a brain just to look at things and think about them. The whole point of a brain is to move. This isn't very intuitive from a human perspective. We can use our brains intensely without budging, as when we listen to a favourite recording. But ultimately there is no aspect of our mental life that is not founded upon, and devoted to, motion. Movement is the concern of the whole brain. (Jourdain 1998, 206–7)

We tend to think of our great human achievements in mathematics or art or rocket science and other such brainy stuff, but, despite the ease with which a simple computer can beat world champion chess players, we would be hard pressed to design a robot that could keep up with a six-year-old in a forest (much less an antelope or leopard!). Movement is arguably more cognitively demanding

than calculation and analysis, though we often do not realize it because we are extremely well adapted to movement challenges. That the lion's share of our evolutionary development favours this conclusion seems obvious enough. I believe music—especially music that requires study and the digestion of cognitive structural patterns, be that learning to read, memorize and improvise on chord progressions, compose, etc.—presents one of the most complete marriages of the corporal and intellectual realms, or, if you will, modes of being. Toro's work is an attempt to bring this marriage to the practice of rhythmic multi-dimensionality. It uses universal technique as the basis for a more universal understanding.

ET: You see when I started doing this I noticed the two...I'm doing two motions. And I noticed...what people call independence. You see? Because right here, there's two motions. This hand is going like this, a third from the pulse. It's its own motion. And now I could see the one clearly! Very clearly! And I could see two motions. That's...they're like two different tempos. That's Einstein. They're two different times within you. Clearly! And I... it's just very clear to me. I understood. Bingo. The dotted note takes you to a place...that if you do it correctly, using the downbeat and your offbeat, it has its own time! And it gives you the feeling of independence. You see? Where, the other way, you are a subdivision of this. And that's linear. Ggghh. That's gravity, heavy gravity! This other way, there's no gravity! All of the sudden, there's no tension! It goes 'thghhh' (makes a sound of connection, suction, docking). If you develop it further, you can do four. Because you're doing two. If you bring out the offbeat, in this hand (RH), like you're doing here, you're immediately doing four and six! With its own motion. No tension. Do you understand? Heavy for me. Very fundamental. Very heavy.

JD: And what if the approach was to figure that out somewhat intellectually but then to just rest with it and to let your body find these motions?

ET: No! That's not my experience. My experience is that I did it...

JD: You have to have the right motion from the beginning...

ET: If you have the right motion (repeats), this (shows hand) is your *one*. Once you develop that, you can do things with it—people say against it, but it's the wrong concept—you do things with that, but, with its own motion...ahh, you could do whatever you want. But, once you do this, as a subdivision of this (indicating the two hands), it takes this, and it becomes linear, and you can't do anything. It becomes very difficult. With a lot of strength, you can manage to do certain things...it's not the same thing. It's not what I'm talking about. It's not the realization. You can eliminate and don't use motion at all. Just go 'dadadadada' (holds up arm moves wrist) this from here (wrist) you know? Like single motion, not dimensional motion. You can do things but it's not...it's not what you want. You want to have a body that is going with its own motion because the offbeat is a support of the downbeat, you see? And it creates its own thing. (Demonstrates, points at right arm, smiles.) That's its own motion. And it has nothing to do with this except that it's a third from this. That's not the way we learn to do things. You know? This is a way like...naturally, to split the thing. So I stumbled onto this all at the same time. And I could see it clear. And so, I know that it works. I know. (Toro 2012a)

I am reminded of a story I have told many times. A friend and I were in a large, open park-like section of the Arcata Community Forest in Northern California, on a beautiful spring day. We were

talking about rhythm, enjoying ourselves, and working out some West African phrases we had recently learned in a workshop with some 'master' drummers from Guinea or Senegal, I believe, when another drummer turned up wanting to play with us. He was a quintessential 'hippy' type—young, lots of colourful clothing, long hair, perhaps some dreadlocks, necklaces and bangles, and an open attitude, ready for a jam session. He made a few attempts to play along with us, but we were adamant to continue our work, with a possible undertone of rhythmic snobbery. We started and stopped several times, working out the complicated phrasing. This obviously frustrated him, because he finally said, with an exasperated teacher's air: "Dude. Just swing your arms! It works! Really!"

I have told this story on many occasions while teaching, the lesson being that whatever you want to do in music, you must hear it in your mind first; we work toward perfecting the connection between the inner voice and the hands (or feet or fingers or voice) so that we play what we intend, and do not 'just swing our arms,' to see what comes out. Another intended message is that African traditional rhythms are serious, intricate music, not just (random) jamming in the park, as some people seem to think. This is still my position. However, since working with Toro I have come to see that there is another wisdom in listening to the body and striving to let it move as freely as possible. I see now that we were both right, or both half right. I knew the importance of relaxed technique long before I had ever heard of Toro. The message was there, knocking on the door, especially in piano lessons and books on technique, and even my own reflections, but I was too consumed by information and information processing, to pay it full attention. I now see in finer detail that the natural movement of the body in the execution of music is an awareness that never stops deepening, and is never to be taken for granted, if one wants to continue to progress. The first line of my first transcribed lesson with Toro reads, "Start from zero every time is the way." (Toro 2012a) This means to check your motion, to check the connection between your core and your fingers (or hands or feet). If you give the signal for a certain movement, does the body come near to executing that movement itself? Can it be more so? If you give the signal to go one third faster in another limb, does it happen naturally and freely, with awareness in between, not with one as a calculated result of the other? This may sound esoteric to some, but with experience, these questions seem more and more normal. At my level, there are no pure answers to those questions, only observations and intentions. That is, old habits die hard. I still do rely on calculation, sometimes, to figure out difficult combinations. But my capacity to perceive and direct independent, interdependent motion is becoming clearer. The motion feels independent when comparing limbs but interdependent in the core of the body, where the motions must, by necessity, interact. It is more than necessity, however, it is a great pleasure. When it works—and the difference between working and not often depends only on remembering

to use my awareness in this way—it is dancing. It is the best kind of dancing, from the core outward, but then I have always been an Africanist at heart.

Helpful Signposts and Observations

Before leaving the linear perspective, however, I would like to discuss a few more points. In developing the capacity to diverge from the predominate metric cycle through a subdivision regrouping exercise, such as the dotted note, I found it interesting and helpful to realize that several distinct perspectives emerge, independent of the actual combinations. This was touched on above. To take a common example, if we work with groupings of four and three subdivisions at the same time, we can conceive of them this way:

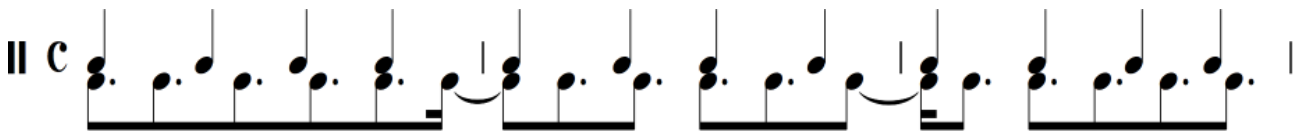


Figure 88. Subdivisional Groups of Four and Three.

The top line can be counted while played, without subdivisions, as:

ONE, two, three, FOUR, one, two, THREE, four, one, TWO, three, four, ONE, etc.



Audio Example 43. Groups of Four and Three Subdivisions, Counting on *Four* (CD Track 43).

The numbers keep the metric cycle, the emphasis, shown in all capitals, the smaller repetitive cycle, or, where the two lines meet in rhythmic unison. To make things more consistent, I will call this the **cycle of relation**, as this is where the relationship between the two lines repeats, regardless of their positions in one metre or the other. This cycle of relation is a three with four polyrhythm/polymetre. With subdivisions, we'd hear:

ONE, e, and, A, two, e, AND, a, three, E, and, a, FOUR, e, and, A, etc.,

nested inside the previous count. This time the capitals emphasize the bottom line articulations, or the dotted note.



Audio Example 44. Counting Subdivisional Groups of Four and Three (CD Track 44).

From, 'the other side,' with the dotted note in our foreground, we could perceive it as this:



or, simply this:



Figures 89 and 90. The Dotted Perspective: Subdivisional Groups of Four and Three, Repeating in One Bar, or, The Cycle of Relation.

This can be counted almost the same as above, but repeating after three beats:

ONE, e, and, A, two, e, AND, a, three, E, and, a, ONE, etc.,

or, looking from the bottom line and emphasizing the top:

ONE, trip, let, two, TRIP, let, three, trip, LET, four, trip, let.



Audio Example 45. Subdivisional Groups of Four and Three, Cycle of Relation from Both Perspectives (CD Track 45).

This is, of course, the very same cycle of relation. It repeats four times before the larger, cycle of repetition has run its course. This happens when both lines have beat one on the downbeat of both 'metres', i.e., when the cycle of relation meets the original, 4/4 metric cycle.

In summary, we can hear this dotted note example or other similar 'crossing' pattern: 1) As the original metric cycle with a dotted note complement; 2) As the cycle that results from the subdivision regrouping exercise (here, the dotted note); this now becomes the foreground (here, triplets), with the other line in a 'crossing' relationship; 3) As the cycle of relation, which will be a smaller poly-rhythmic cycle, which repeats x number of times within the larger cycle, x being the original metre.

More Than the Dot? Perspective...

So what if, as we have seen in the examples drawn from Indian Classical rhythmic practice in Kippen and Montfort, we use a higher order regrouping factor than three? (Kippen 1988; Montfort 1985) Say, five and four? Does the dotted note still somehow apply? I would say it does, in at least two ways: One has to do with perspective and the other is a creative, technical trick (though far from original). In terms of perspective, the dotted note, like the two and three relationship at its essence, is a bridge to multi-dimensional, rhythmic perception. It is a bridge because on the one hand

it is easy to derive and execute, as in simpler examples it is based on downbeats and upbeats only; as mentioned in the section, “Two and Three: The Foundation” (page 95), we have only to divide the beats in half. On the other hand, to play it and stay with it until its full resolution while keeping track of the original metric cycle or pattern, requires—and develops—the ability to perceive both at once, and to feel the motion of each, coexisting within you; to realize that they are both related and independent.

ET: This confronts you with that problem that these must be two different...(gesticulates)...they must be two different things within you.

JD: So that's what you're training: To have a split awareness.

ET: Not a split awareness! To have perspective. And to be able to understand that there's pulse and that there's motions; there's different waves, that are part of this thing. But they're their own, even though they're generated by this (hands move to show pulse). The linear way is to subdivide this...doesn't work! The harmonic way is the way. Where things...the three...there's no three in any waves. Waves are just downbeats and upbeats. So the three comes from the third frequency. And that third frequency is not a subdivision of this. It's its own monster. And that's a concept, that must be understood. But what it is that every wave is part of a harmonic system. It's its own monster. Because it has its own downbeat and upbeat. And I noticed that by playing. I said 'Ahh. Fantastic.' You know because you get the feeling, you know? (Plays *For Your Hands Only* page 18: a triplet ostinato with the last line, which is offbeat sixteenths, i.e., even numbered 32nd notes, four to the beat.) Those are those two frequencies. And when I played that, I went, 'Bata music.' Ok? And then I heard all the music that has that, that I know. I go, 'Of course.' But to get here, the first pages were grueling. (Toro 2012a)

And Additive Rhythms

The other way I have found the dotted note to be helpful, especially when the subdivision or re-grouping unit is of a higher order like five or seven, is its use as a building block for those larger structures. This has been mentioned several times throughout this thesis; all rhythms can be broken down into two and threes. It was seen above in figures 7.82 and 7.86 (groups of five and seven with sixteenths and tresillo, respectively). This additive perspective is inherent in *Konakol*, the Indian, syllabic, rhythmic counting method as well. (Montfort 1985; “Konnakol” 2014; “Konnakol-The Art of South Indian Vocal Percussion”) Three subdivisions are counted, 'takita', four, 'takadimi', five, 'taka-takita (two and three), seven, takadimi-takita (four and three), nine, 'takadimi-takatakita', (four and five), and so forth; odd numbers are always reconciled with the 'takita' three grouping unit⁷⁸.

⁷⁸ Toro would take issue with some of these, stating that the proper, 'natural' way to render them is with the larger number first, i.e., takatakita-takadimi. This way the symmetry about the two/global upbeat remains intact. Pillay did teach me a *tabla* phrase of nine subdivisions this way: na ki na num ki--na ki num ki. (Pillay 2011)

To look at the linear, regrouping principle with a few familiar and a few more complicated examples, I put some of the key elements in table form as an aid to grasp the various analytical perspectives. The most important rows are shaded.

1	Example	A	B	C	D	E	F	G
2	Beats per Cycle	2	2	3	3	4	4	5
3	Subdivisions per Beat	2	4	4	5	4	5	3
4	Regrouping (sub)	3	3	3	3	5	7	4
5	Subdivisions per Bar	4	8	12	15	16	20	15
6	Cycle of Relation (sub)	6	12	12	15	20	35	12
7	Cycle of Relation (beats)	3	3	3	3	5	7	4
8	Cycle of Repetition (sub)	12	24	12	15	80	140	60
9	Cycle of Repetition (bars)	3	3	1	1	5	7	4
10	Cycles of Relation Within Cycle of Repetition	2	2	1	1	4	4	5
11	Cycle of Relation Polyrhythm (beat: regroup)	3:2	3:4	3:4	3:5	5:4	7:5	4:3

Table 15. Some Helpful Perspectives on Subdivision Regrouping.

The first three shaded rows are the choices that determine the form of the regrouping exercise. The next shaded line (7) tells us how long the cycle of relation is in beats. Note it is always the same as the number of subdivisions in the regrouping. The next shaded line (9) shows how many bars the whole cycle will take. Note that this is also equal to the number of subdivisions in the regrouping unit, except in examples C and D, where the regrouping unit has the same number of subdivisions as the bar has beats. In these cases, the cycles of relation and repetition are the same length. A dotted note does not bestow linear, bar crossing dimensionality in three, but one bar of polymetre. Finally, the last two are perhaps the most useful, especially for the longer, more complex examples. These show how, as suggested previously, we can think of the whole cycle as one or several repetitions of the polyrhythmic cycle of relation, whose ratios are shown in the last row. These ratios, as

indicated in parenthesis, show how many main beats occur per each regrouping unit; this is the inverse of the main subdivision value to the regrouping value. In other words, if we take 5/4 time—five beats with four sixteenths each—and regroup in three, we get a three:four polyrhythm (re-group:subdivisions) that repeats every three beats (regroup). Five of these cycles (starting on each of the five beats) will happen in the three bars it takes to complete the cycle.

The following are illustrations of the examples presented in the table.

Example A: Two beats of two subdivisions grouped in threes; 3:2 polyrhythm happens twice in three bars:

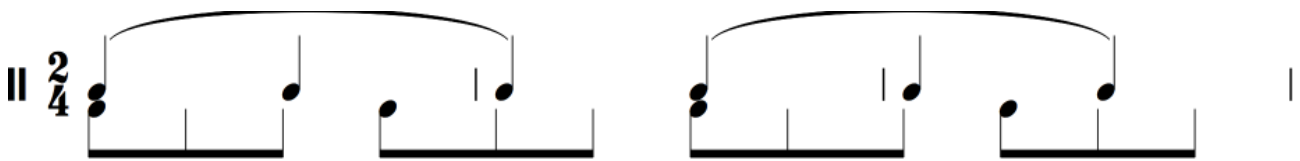


Figure 91.



Audio Example 46. Linear Example A (CD Track 46).

Example B: Two beats of four subdivisions grouped in threes; 3:4 polyrhythm happens twice in three bars:



Figure 92.



Audio Example 47. Linear Example B (CD Track 47).

Example C: Three beats of four subdivisions grouped in threes; 3:4 polyrhythm happens once (resolves in one bar):



Figure 93.



Audio Example 48. Linear Example C (CD Track 48).

Example D: Three beats of five subdivisions grouped in threes; 3:5 polyrhythm happens once:



Figure 94.



Audio Example 49. Linear Example D (CD Track 49).

Example E: Four beats of four subdivisions grouped in fives; 5:4 polyrhythm happens four times in five bars; note additive 3+2 grouping:

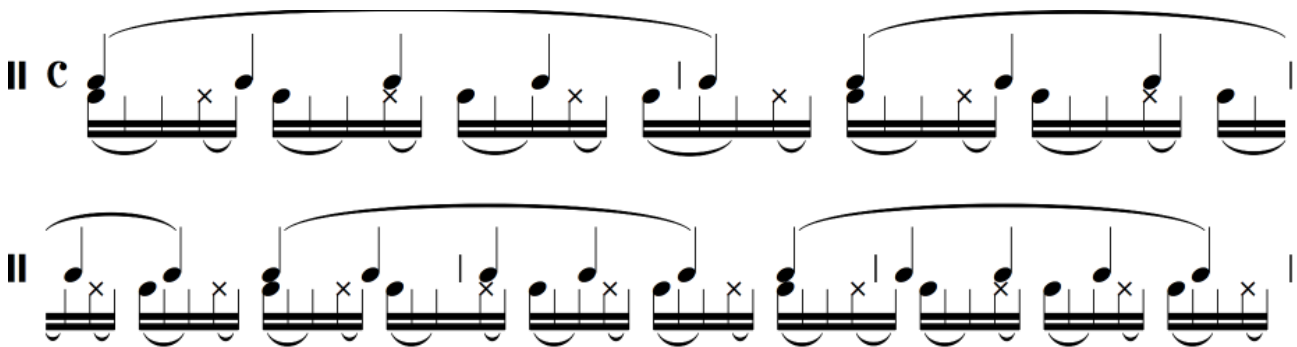


Figure 95.



Audio Example 50. Linear Example E (CD Track 50).

Example F: Four beats of five subdivisions grouped in sevens; 7:5 polyrhythm happens four times in seven bars; additive grouping is 2+2+3

Figure 96.



Audio Example 51. Linear Example F (CD Track 51).

Example G: Five beats of three subdivisions grouped in fours; 4:3 polyrhythm happens five times in four bars

ONE trip let 2 TRIP let 3 trip LET 4 trip let FIVE trip let

|| 15
8

ONE e & A 2 e AND a 3 E & a ONE etc.

1 TRIP let 2 trip LET 3 trip let FOUR trip let 5 TRIP etc.

1 TRIP let 2 trip LET 3 trip let FOUR trip let 5 TRIP etc.

1 TRIP let 2 trip LET 3 trip let FOUR trip let 5 TRIP etc.

Figure 97.



Audio Example 52. Linear Example G (CD Track 52).

Once again, the experiential perspective comes into play and some of these examples, especially example F, are quite difficult to play. The chart and the examples, in providing a few structural signposts, are meant as an aid for someone willing to put in the effort to work through these types of rhythmic challenges. They are also intended as a partial codification of the largely intuitive process that might go on in the mind of someone who is skilled at these types of manipulations, perhaps an Indian Classical rhythmic specialist, though in that case the rhythmic structure would likely be rendered and manipulated in *konakol* syllables or *bols* representing the sounds on *tabla*, *mrtingam* or other instruments.

The foregoing has been about the method of deriving polymetric relationships based on subdivision, here as linear grouping patterns within another metre. The cycle of relation, by itself, with its accents considered as beats in themselves, is polymetre. And, as warned, it can become quite difficult to derive and manipulate complementary metric structures from this perspective. Fortunately, there is another way, which leads us to back to *The Odd in You*.

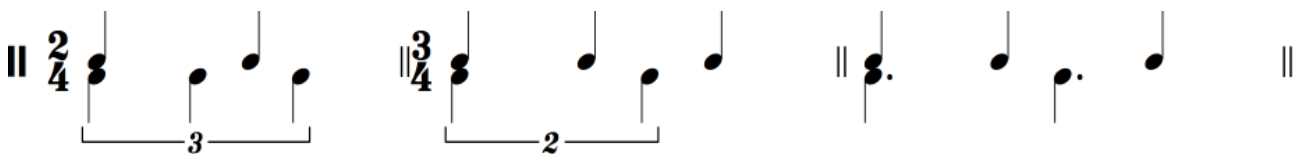
Polymetre

It should be clear by now that motional 'down' beats and 'up' beats occur on many levels of the rhythmic hierarchy. An illustration of this phenomenon was presented in figures 7.74 and 7.75, the

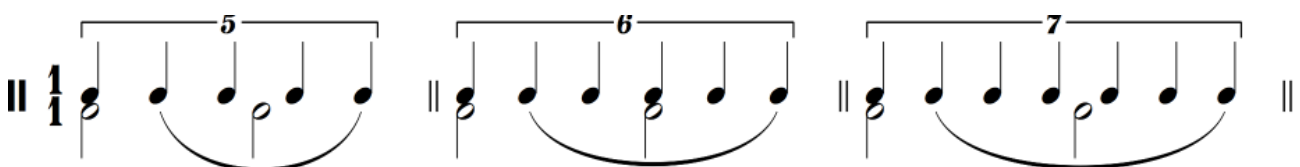
preliminary exercises of *For Your Hands Only*. The first line of 'downs' is followed by the second line of 'ups'. Those two are then combined to make 'downs' at double the pace, which are followed by their respective 'ups', and so on, until practically unfeasible. Key to rendering this sort of exercise valuable, once again, are aural and motional awareness. Down strokes can be played on the 'down' beats at a particular hierarchical level of the rhythmic structure; they can be played this way with up strokes in between, so that motional and aural/structural awareness coincide; or, they can be played on the 'up' beats, in which case motion and hearing are opposed. With all these capacities firmly embedded in our approach, we can consider their value in approaching polymetre.

Always the Wave

At the primary metric level, where there is just one downbeat (beat one), there is also just one up-beat. This perspective can be applied to any metre. It is thus, in Toro's view, the key to combining metres, in lieu of the linearly conceived counting methods covered in the last section. If we take the cycle of relation from any of those exercises, we will see that the accented subdivisions representing each of the two grouping structures repeat in a symmetrical pattern around the primary upbeat of that cycle. In the case of *three* and *two*, the second articulation of *two* is the primary upbeat, marking this as a primordial polymetric pattern, at the foundation of multi-dimensionality.



However, the symmetry exists, no matter the combinatory second metre.



Figures 98 and 99. Symmetry About the Primary Upbeat.



Audio Example 53. *Five, Six and Seven with Two* (CD Track 53).

Note the new time signature. Although not functionally different from common time (4/4 or 2/2), it nevertheless carries the implication that neither the five, six, seven or two are the 'main' unit of counting. They all relate to one, and its upbeat.

This symmetry can thus be used as a reference when combining metres, or superimposing them on the same *one* cycle.

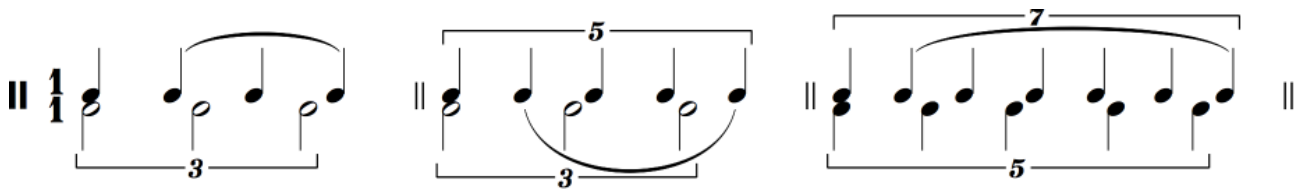


Figure 100. Downbeat/Upbeat Symmetry without the Upbeat Reference.



Audio Example 54. *Four and Three, Five and Three, Seven and Five* (CD Track 54).

It is as if their durations about the primary upbeat, and therefore each other, are in rhythmic retrograde from one half to the other. This perspective helps to simplify the relationship even in complex combinations such as the five and seven above or, here, five and six:

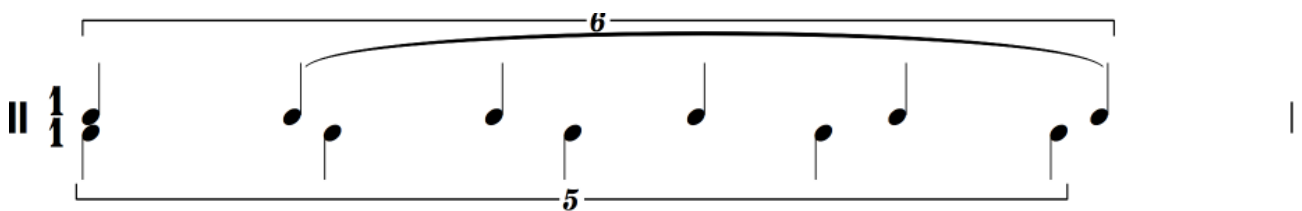


Figure 101. Symmetry in *Five with Six*.



Audio Example 55. *Six and Five* (CD Track 55).

It as if we hear, 'together - - - - six five - - - six - five - - six - - five - six - - - five six - - - - ; or, after hitting together on the downbeat, they strike very near, with the faster one (six) preceding, less near, then six in the middle, surrounded by equal space, then the reverse: Five preceding six, less near, then very near.

Here is seven and five again. I have spread the empty, upbeat area, indicated with an up arrow, in order to make the downbeat and upbeat halves stand out.

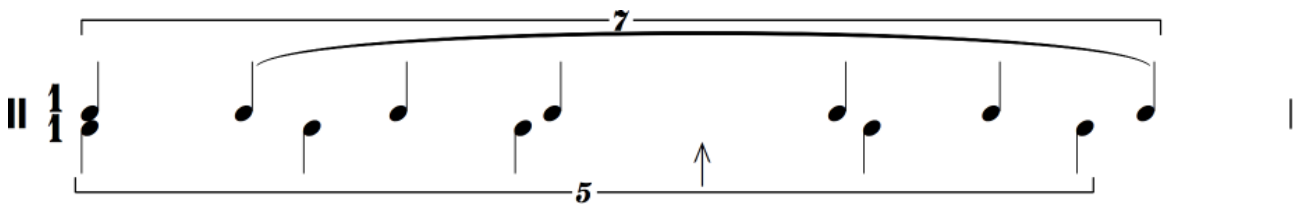


Figure 102. Symmetry in *Five with Seven*, Notes Spread About Upbeat Mark.

Jogging the Memory

Symmetry is one of several perspective enhancing shortcuts I use to hear or remember the interactive melody between the two metres. Other ideas I find helpful are:

- Deriving the order of interaction from the metric relationship: Using the difference between the metre factors, we can get a quick picture of their interaction pattern. For example, *three* from *four* leaves one extra articulation to be distributed in the *four* line. It will occur in the first interaction and the rest will alternate—four, four, three, four, three, four (also see *six* and *five*, above).

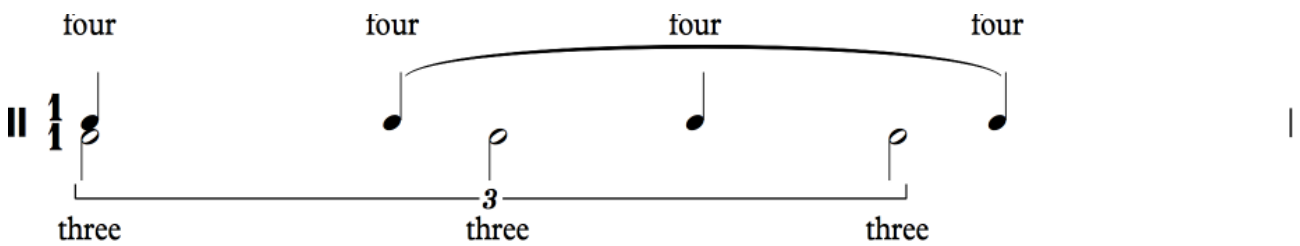


Figure 103. *Four and Three*. Interaction Pattern: 2:1, 1:1, 1:1.

If the difference is more than one, the next instance of two successive articulations of one metre will occur in the middle, around the upbeat (also see *five* and *three* above).

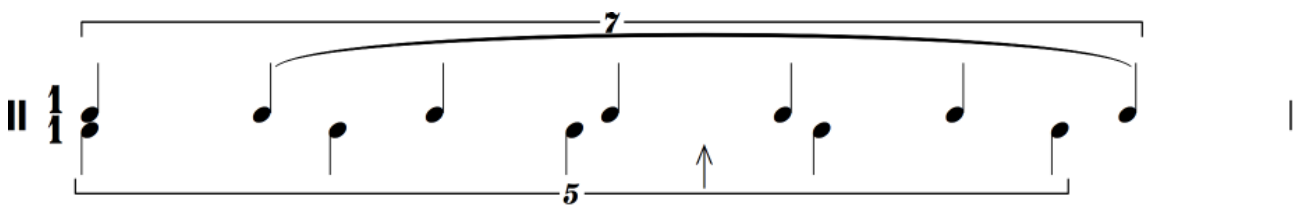


Figure 104. *Seven and Five*. Interaction Pattern: 2:1, 1:1, 2:1, 1:1, 1:1.

As the difference gets greater, the interaction pattern will proceed toward a simpler ratio; in *seven* and *four* we see a 2:1 ratio for all but the last interaction:

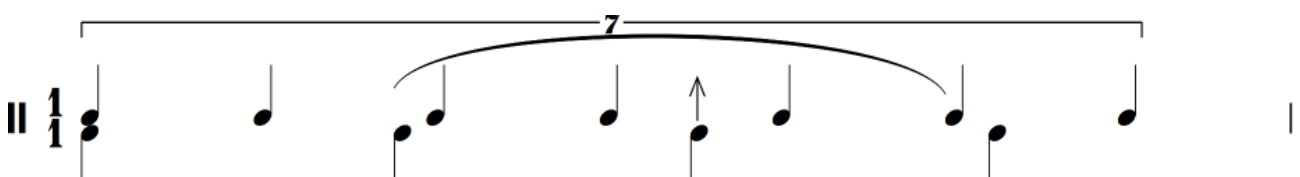


Figure 105. *Seven and Four*. Interaction Pattern: 2:1, 2:1, 2:1, 1:1.

And with eight and four everything is evened out:

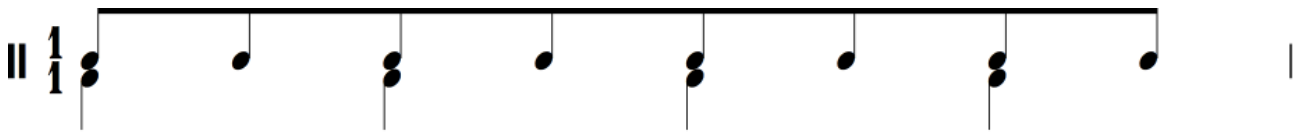


Figure 106. *Eight and Four*.

Proceeding to a still greater difference, the process begins again, adding to the first interaction to make 3:1, 2:1, 2:1, 2:1:

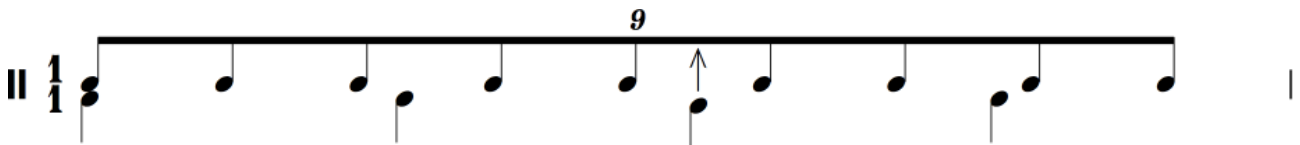


Figure 107. *Nine and Four*.

Then 3:1, 2:1, 3:1, 2:1, which can be conceived of as five and two twice:

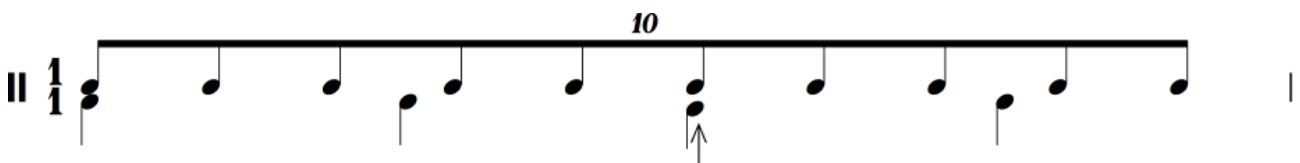


Figure 108. *Ten and Four*.

And 3:1, 3:1, 3:1, 2:1:

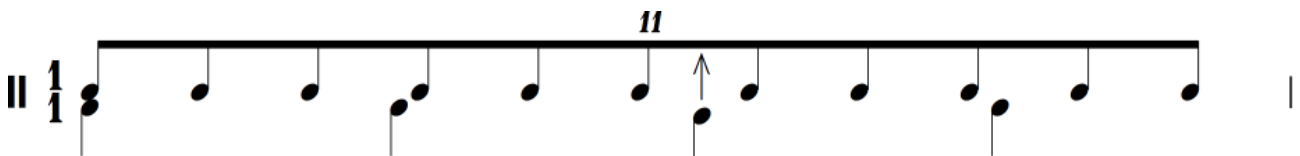


Figure 109. *Eleven and Four*.



Audio Example 56. *Seven, Eight, Nine, Ten and Eleven with Four* (CD Track 56).

These are not actual ratios, of course, but patterns of interaction. Some help with the timing of the interactions follows.

- Subdivision size: The differences between the adjacent beats, from the perspective of one metre, is some factor of subdivisions equal to the other metre. This is especially helpful in smaller metric combinations such as three and five, where we might think, 'ONE, two, (trip),

LET, three, four, TRIP, (let), five.' This is a combination between linear regrouping and harmonic hearing; the interaction pattern of the articulations from the respective metres being known, the timing is taken from knowledge of their mathematical relationship. This is obviously less helpful in combining two higher order metric structures with correspondingly smaller subdivisions, such as seven and five or higher.

- Mnemonics: Although less than precise and with their own potential for bias or rigid thinking, verbal phrases can nevertheless help to jog the memory. I first learned this technique from Frank Bennet, a South Indian and jazz drummer, in a class he taught at UCLA, entitled 'Cross Cultural Perspectives in Jazz.' Examples are: 'Pass the butter,' for *three* and *two*; 'Pass the Gosh Darn Butter,' (expletives tamed by me) for *four* and *three* (for me, the *four* comes out more), or, alternatively, 'Hot chillies hit the spot,' (in which I hear emphasis on the *three*); 'Hot chillies sure do hit the spot,' for *five* and *four*, and so on.

Wave Interactions, Tricky Surf

The preceding ideas were some of my observations gathered during the process of learning and remembering various polymetric combinations. The next idea is Toro's approach to this process. For him this is the essential concept that sheds light on these relationships of contrasting metres. It is the direct application of the downbeat/upbeat concept to the combination of metres. As mentioned previously, when odd metres are seen about the upbeat, they occur part before, part after⁷⁹. Even numbered metres repeat on the upbeat. When dividing odd metres in two then, the first half will have one more count than the second half⁸⁰ (though the extra count is only one half long, see footnotes, below). Thus, *three* will divide 2 + 1 (on-beat articulations). *Five* will divide 3 + 2. *Seven* is 4 + 3, and so on. Therefore, when combining metres, the process is greatly simplified by considering how their halves combine. Four and three is like *two* and *two*, then, *two* and *one*. *Seven* and *four* and is like *four* and *two*, then, *three* and *two*. *Seven* and *five* is like *four* and *three*, then, *three* and *two*.

The reader will note the word 'like', in the above statements. The timing is not exactly those ratios. If it was, the cycle would start over in the middle and would effectively be the doubling of a reduced ratio; for example, we saw previously that *ten* and *four* is really just *five* and *two* twice. Alternatively, the cycle would consist of two ratios in a row with one of the component metres kept steady (isochronous) and the other adjusted as two, independent halves with different timings (e.g.,

⁷⁹ Only the central offbeat of an odd metre coincides with the primary upbeat of the *one* cycle, but to consider it is akin to doubling the odd metre in question thus making it even.

⁸⁰ The offbeats are the reverse, making the two halves even in length, e.g., $2\frac{1}{2} + \frac{1}{2}2 = 5$.

seven and *five* as *four:three* then *three:two*; if one metre is isochronous the other is dependent and non-isochronous). Nevertheless, the concept, with a keen ear, helps to reduce the task into more sizeable chunks. A keen ear is of paramount importance all through this discussion, as is the awareness of steady, interdependent motions as all but the ponderous method of subdivision regrouping gives but approximations of the timings involved. Thus, once the relative interaction pattern is well established by some combination of the above methods, the ear and the motion of the body must take over to refine the different patterns into more or less even (isochronous) renditions of their respective counting structures. I say, 'more or less,' because as we've seen in the discussion of feel, multi-dimensional music, as produced by human bodies in motion, is not calculatedly 'perfect.' If it was, it would not sound right to most of us. It is the 'perfection of the imperfection' which we seem to find more profound.

A Walk Through

As an example process from my experience, to play *seven* and *five*, I might do the following, not necessarily in this order:

- Having played this combination before, I would think of the two half, downbeat/upbeat interaction pattern. This is *four* with *three* then *three* with *two*.
- Knowing that the second half does not start together, I would play the *four* and *three* then the *three* and *two*, but on this second ratio I would use a slightly staggered start, the articulation of the *seven* limb in front of the other, *five* limb.
- I would now try to listen to the two, count each to make sure they are right and attempt to adjust them to be more or less even.
- Remembering that the timing of the interactions in the second half is a mirror image to those in the first half, I would try to hear and adjust my strikes to hear this quality.
- If and when it feels pretty good, I might check with a metronome⁸¹.

At this point, I imagine an observer might have several nagging objections, for example:

- What is the use of all this? Is this just rhythmic 'gymnastics' or is this relevant to music?
- Why not use the permutation regrouping method? I prefer to be organized, didactic and accurate in my studies.

⁸¹ There are also polymetric capable, computer based metronomes such as the Bounce Metronome. ("Check Out the Astonishing Bounce Metronome Pro")

Why?

I will address the second of these questions first. Remember that the process/training methodology of *The Odd in You* considers, from the beginning, not two metres at a time but three. (Toro 1994) If keeping track of the subdivisions and regrouping patterns of *five* and *seven* is difficult, then *five*, *seven*, and *four*, seems to my mind at least, near impossible. If it is possible, it would involve a tremendous amount of practice. To do *two* and *three* with my feet and then be comfortable and feel playful with *two*, *three*, *four*, *five*, *six*, *seven*, *eight*, *nine*, *ten*, (sometimes) *eleven*, *twelve*, (sometimes) *thirteen*, *fourteen*, *fifteen* and *sixteen* in my hands took me a few months of semi-dedicated practice. But that is only the first page (with my own extensions; the first page goes to *nine*). The first section of the book, dubbed a 'widow-maker' by *Drummer Talk* host Dave Kropf, (Kropf) goes on to present the same method with the feet doing *five* and *two*, then *seven* and *two*, then *three* and *four*, *five* and *three*, *seven* and *four*, and so on, through twenty one exercises in total. At first inspection, it seems difficult or impossible to get through all of this material. However, the new challenges presented in each exercise are manageable because they present the same material over and over in different combinations. Manageable, that is, when approached from the aforementioned perspective; by hearing and feeling the metric combinations, not by calculations of subdivisional groupings. The challenges themselves can be surprising; just because I can do *three* and *four* with the feet and *five* in the hands, for example, does not mean I can automatically do *five* and *three* in the feet with *four* in the hands. The method is a clever way to investigate the harmonic series and its relationships, over and over, from many different perspectives. But, each time I work one of them out, it becomes clearer that I know these relationships already, and, they become yet more familiar. Toro noted on several occasions that if you study the harmonic series long enough it starts to talk to you.

If you don't look at the harmonic series...if you don't spend a lot of time looking at the harmonic series, you'll never understand, and you'll never see it. Because everything is in the harmonic series. And that's the platform. And if you get off the platform then nothing is happening. You have no basis. No point of view. A point of view is...the grid. And if the grid is present always, you will always develop a point of view. (Toro 2012m)

And What For?

But to what use is all this study? Certainly, it provides general mental and technical challenges. It also allows the player to hint at or use these various harmonic dimensions in improvisation. For example, with *two* and *three* in the feet and the 'standard' pattern or other foundational pattern in the hands, it is fairly simple to keep the feet steady and then play phrases in *five*, *seven* or *nine* over the top, then return to the original, thus suggesting the much wider spectrum of the rhythmic grid. One could learn to play multi-metrically over other foot ostinatos, or use the feet to do so over ostinatos in the hands.

Perception

The primary reason for working on this material, however, according to Toro, is to increase *perception*. According to him, as suggested in the previous discussion about the offbeats of five being the 'most used melody in Latin music,' ("Multi-Dimensionality 1," page 78) these other metric references are all over the place, especially in AT/Musics. Of course, being familiar with the material in *The Odd in You* will certainly help someone to play in unusual metric structures like *five*, *eleven* or *thirteen*, but according to Toro, these structures are heard plentifully in more common metres like *two*, *three* and *four*, but for melodies, improvisations, and vocal lines, not for the base metric structure.

ET: And little by little, you'll be able to hear *five* in *two*, if you do this long enough. Clearly! And then little by little, you will hear *five* in *three*! Clearly! And then, if you listen to music and you know music, you will know music that has *five* and *three*. (plays them a bit) That Adama Drame (Jembe drummer from Burkina Faso) tape has *fives* all over the place. He loves *fives*! And it has *sevens* too. But *five*, more. And they play it all the time! *Five*. Every (one) in Cuba, in playing *rumba*, plays *five*. And we play *five* in Puerto Rico, all over the place. And it's in all music, all ethnic music, a lot! A lot. It is as a melody. It's not as a pulse. We don't use *fives* for pulses. We use them for melodies. And it's quite interesting.

JD: But are those melodies that a drum soloist might play or just a singer?

ET: Singing. When a singer sings in *five* it sounds like it's out of rhythm. Because it sounds like speech. (Plays *five* with *tresillo* bass pattern) Those are *five* on the downbeat and on the offbeat. (Sings some nonsense syllables similarly, sounds stretched, loose, free). Beautiful.

JD: But might the soloist play like that too?

ET: Of course.

JD: Imitating singers, I'm mean, a *quinto* player or...

ET: We all do those melodies. That's music! We use them for melodies. We don't use it for pulses. For basic pulsations of a structure, we don't. We use *one*, *two* and *three*.

JD: So when you say that you mean we don't use it for the groove, the continuous rhythmic groove.

ET: We don't use it for the base.

JD: But when you say it's a melody it could be the drummer or soloist.

ET: Anyone. Everyone. Anyone and everyone in an ensemble will play those things, because it's part of...the thing. Unknowingly. In Western culture, we have taken that out of the picture. It doesn't exist. And then, in a conservatory, or, in any other weird place we try to put *fives* in music, like it was an esoteric idea, and somebody invented *five* and put a *five* into it. It's crazy! It's a crazy point of view. It's nuts! (laughs)

JD: They invented it from probability, and said...

ET: It's just nuts!

JD: "No one writes this down. I'm going to write it in mine (composition), and it'll be cool."

ET: But it just doesn't work that way. It's just a weird point of view. It's a weird point of view. It's just being weird. It's just forgetting your nature and all of the sudden doing something, you know, that's actually natural, and all of the sudden you say it's my invention. Your invention? Nature's not an invention of anyone. (Toro 2012m)

It would seem wise to leave out Toro's prejudices against conservatory education—though he and his approach are significantly the result of his own conservatory training—but I decided to retain these comments as they make an important statement about his perspective that emphasizes the vital role of the experiential perspective in his outlook. In other words, until a musician or composer hears how these alternative metric structures are already being used in music—until the perception catches up with the intellect and the will—the understanding and therefore the usage of them will be less than ideal. He also uses a 'loaded' term—'natural'—to qualify this fully attained state of rhythmic perception. I struggle to find a better one, but I find that if the meaning is taken as 'well-balanced', and, 'following from experience', the term is not so objectionable. To be a 'natural' artist, speaker, leader, mechanic, etc., implies this same sort of sublime mastery of a discipline. It is to have an intuitive grasp that extends beyond one's knowledge of the components as bestowed by their formal training. The hypothetical composer he speaks against would be using intellect without intuition, without an aurally, experientially inspired notion of where the *five* is just right for his or her composition. This idea still bespeaks a good degree of prejudice concerning the 'correct' origin of music. In a world free of artistic prejudice there is room for any composition, intellectual, random or silent. Nevertheless, his vision is compelling, and his suggestion is that many people are missing this multi-dimensional perceptual landscape which he claims forms the backdrop for 'natural' music making.

It's not to be better or worse. You're either connected, or you're not. And so, when you know nature, and you know how natural things sound, you know who's connected! You just know. You hear it and go, 'Ok.' (Toro 2012m)

The preceding interaction also points to Toro's view that—perhaps through our tendency to venerate notated music and our music notation system—we have been missing these other metric references that, according to him, are, 'all over the place.' Probably there are other performers and composers who realize this phenomenon; certainly in the case of feel, it has been well documented that a Viennese Waltz, for example, is not to be played with the isochronous triplet found on the page, as jazz swing is not played in even eighth notes. (Bengston 1977; Benadon 2006) This is partly why a performer studies with an experienced, live teacher, potentially for a decade or more: To learn how to interpret the notation.

But on the level of metric structures, and multiple, coexistent metric structures at that, perhaps the bulk of trained musicians *are* missing these realizations. To indulge in the generalization, it is as if

we take the map to be the terrain, rather than a greatly simplified reduction. Notation is a set of instructions, invented before recording technology, to help us find our way to an experience of music. Perhaps it is because the great Western masters from the Baroque on left such detailed, intricate maps, rendered only by highly trained and talented readers, that we have tended to honour and respect them as *music*. There is no great crime here, but (still under the assumption that Toro is hearing what the rest of us are missing) other musical and cultural systems have found profundity in other approaches. The harmonic perspective of rhythm attempts to unify some of this theoretical terrain.

From another perspective, looking from Western pedagogical model, how can it be that many of the cultures in the world who have developed a fine level of rhythmic perception have done it without learning to read or in many cases even count to their music? I overheard a piano teacher who plays in an orchestra tell a young pupil just the other day that a piece with a swing feel indicated needs to be played, 'out of time.' It is good that she recognizes the difference between the notation as strictly interpreted and the swing feel indicated, but does this not also expose a subtle concept that notation is the real measure? It is *a* measure, and a very useful one, but nowhere near the model of rhythm. Have we in the West ended up taking orders from our own invention; our Frankenstein's monster?

A Way Forward

As previously mentioned, I don't advocate abandoning Western music notation (and I believe I speak for Toro here as well), merely expanding its concept, and placing it alongside other conceptual and pedagogical modalities, in the development of the new generation of 'world class' musicians. For one vision of what this might look like, we have the disciples of *El Sistema*, in Venezuela, thoroughly grounded in the folk music of their country (as suggested by Toro) and very well-trained in Western Classical music as well. They play to acclaim for their energetic interpretations, and seem to be in some sense revitalizing the European tradition⁸². (Wakin 2012; "El Sistema" 2014) Their percussion ensemble, for its part, seems comfortable and intent on representing Afro-Venezuelan rhythms while touring outside the country. ("El Sistema's Percussion Ensemble Visit in Harmony Lambeth") Toro, who was due to give lectures in Venezuela through *El Sistema* before coming to South Africa for our research encounter, says that the Venezuelan ethnic music is "happening and extensive," and that you can hear it when the *El Sistema* musicians play; especially, 'crossover' pieces like Leonard Bernstein's mambo (from the musical *Westside Story*). On the web

⁸² This idea is not without its distractors, however. For a scathing review of *El Sistema*, from the author of a book on the subject, still unpublished at the time of this writing, see Geoff Baker. (Baker 2014)

forums of El Sistema USA (the program has reportedly been replicated in 55 countries (Malek)),

David Malek posted:

This week we are working with drumming master Jerry Leake (cited elsewhere in this document) as he introduces us to rhythmic patterns from Africa and India. As I listened to and performed these rhythms with my colleagues I became aware of the power of this rhythmic language and the part that it plays in musical literacy. Understanding these rhythms and forms opens up many musical worlds including jazz, fusion, rock, Latin and even the classical ostinato as they relate to feel or groove. I can image how much richer my own musical life would be by having integrated these rhythmic forms into a musical vocabulary for myself and can't help but imagine the creative implications for our students if they were to learn this rhythmic language from a young age. This is truly a core element of musical literacy.

And in a reply from a violin instructor:

I start all of my PreTwinkle classes in both programs with a lolly-pop drum and short rhythm sticks. The children that really blow me away are the ones from South Asian Families. They've already been listening to the Classical music from their countries from birth. The Twinkle Rhythms don't impress them at all. They finish them off in a few weeks as Preschoolers. They leave my occidental students in the dust for several months. Blame it on those tabla players. (Malek, 2010)

These two comments, along with Toro's opinion of the El Sistema approach, are just a few anecdotal suggestions that learning rhythmically sophisticated, AT/Music at a young age can have a significant impact on musical skill and engagement in other genres of music making. The more specific question for this study, to be addressed in the conclusions section, is whether Toro's approach is a significant or even superior substitute, perhaps especially for learners who are not blessed with a multi-dimensional rhythmic experience from early childhood.

Following are more examples of Toro explaining his intended purpose for multi-metric exercises such as those in *The Odd in You*.

...you know this is an exercise of perception. It has nothing to do with music. This is an exercise in perception...of rhythmic perception. Music is not involved. Once you talk about music...and so the connection of this to music...is how to hear how these frequencies manifest in music. Not how you play this into a musical pattern. That's wrong. That's completely wrong. So, you listen to music, and if you can't perceive how this happens in music, you have no point of view. There's not a way like you understand this, and then play it. It doesn't work that way. You can only play it if you hear how it happens in music. Because you go, 'Ahh! That's a *five*!' You see? You hear it, and you go, 'I never thought that was a *five*, but it is.' And then...but you hear *five*, in the context of what's going on, and you hear it! Clearly! And so, it's your epiphany, it's your point of view, and your point of view is unique...

...All I'm trying to do with my books is open perception to the possibilities of playing music. and so, this (indicates the harmonic series on a white board) is what it is, really. This (down, up, dotted) is the basis, linearly, of what this is, this monster. But everything is here (one, two, three). Everything is there. And then if you, by those exercises, begin to hear this very,

very clear...and if you want to play music other than rhythm, then, the question, if you have students, and the question of the student is how do I put this into music, you know that they're looking at things backwards, because you don't put this into music. Music has already been invented, and only you can discover this. I mean the only way you play this, is by discovering how it is done, not by inventing. And what you can do with that discovery is that now you can have a point of view on your discovery, and if you have a point of view, you can take this (harmonic series), and do what I do with this stuff, which is...I can go anywhere. Do you see? Because I have perspective. I know where it is. I know how it is done naturally. I can do it how it's done naturally, and I have a point of view, so I can take that nature and put it in the next galaxy. You see the hierarchy of events? Yeah. So, this (harmonic series) is not music. This is just nature. You learn those things for perception. To play music, listen to music. If this doesn't come, you still don't hear it. You can't force it. It's like you can't force harmonics (points toward the piano, suggesting other discussions about hearing the harmonics that are part of each note). You see? And this kind of learning...I saw a school immediately...twenty some years ago, I saw schools should be this: It should be a place where they show you this (harmonic series), and they show you how to use your ears, naturally. When you develop naturally, then you're ready for the next step! But not...you can't force somebody to play *five* and *three*, just because you want to, not! That's against the law, in nature. It doesn't work. And in Western culture, we want to do that. (Toro 2012n, 22)

Pedagogical Applications?

Here again the vision of a new educational paradigm crops up. Music teachers and school administrators alike might balk at the impracticability of putting intense focus on something as 'natural' as rhythm, when time and funding are scarce in many curricula to include any music at all. Still the idea is of a new paradigm, in which aural training geared toward an open, intuitive, highly inventive rhythmic sense is married with theoretical understanding; a broad, thoughtful and intentional pedagogy, producing people who can hear *and* play with a multi-dimensional rhythmic perspective. The method proposes the marriage of East and West, intuitive and rational. Here is Toro musing on his ideal school music offering:

ET:...To do classes for a music department where you teach everyone rhythm, for a year. You teach everyone rhythm. Not just my way, but the western way and Indian way, and others. And teach them how to read music and just the basis of rhythmic structure, whether it's the western idea...whatever...metres and how to play metres and how to understand rhythm....at a universal way...and not once a week but five days a week...is this thing, for a year.

JD: That would be amazing.

ET: Well yeah. They would learn to read and they would know rhythm. They would know in a year, every day, they would do that.

JD: Yeah, they could do just three months or something, just on Indian rhythm.

ET: Yeah and singing, just the basis of rhythm and then western...just that. People would learn something. But it would be a little thing of the department. Rhythm is taught. Rhythm is researched. How is it that this thing, this rhythm manifests? (Toro 2012j)

Toro is not without support in academia, but he resists the forceful perspective with which institutionalized music education can be conceived.

ET: You know, my teacher at the conservatory, they wanted me to go and do a workshop, so kids can learn how to play *nine* from *four*, and that kind of stuff, or *five*. This is very difficult stuff. If you can't hear *two* and *three*, how can you hear *nine* and *five* and *four*? That's quite difficult. Do you think he understood? He didn't understand (laughs). And so, people don't understand. This stuff cannot be forced. All you can do with this is live with it until you one day go, 'Oh. I hear it.' The first time I heard *nine*, I was...I told you the story...I'm jogging...I'm going to jog, early in the morning, and I'm in the park, putting my shoes on, and I'm hearing *nine*! I'm hearing *nine*. I've never heard *nine* in my life before, and I hear *nine*, how it sounds with *four*! But clearly, clearly! I just sang the melody, and I went like that (counts fingers), and I said, '*Nine and four*.' Have I heard the melody? All my life. The melody's been in my face all my life. But it took one morning to hear it. Do you see? I didn't force it. I didn't force hearing this thing. It happened. And I heard, 'da gi ga ga gon gon gon ga don' (piano *montuno*). I kept repeating that, and I said, 'What am I singing this for?' This is a melody I know since I'm a little kid. And so, I kept singing it and counting it, and I said, '*Nine and four*.' (pause) That's where *nine* and *four* is in my music. And then I sit down to play and it's there. And I go, 'Ok.'

JD: Piano *montuno*.

ET: Yes! But when its done in Africa, when you see Papin (Cuban *rumbero* ("Los Papines") doing it...which I had a tape of Papin, doing *nine*...in a rumba. He liked to do those kind of things. And if you hear Dudu Rose (Sengalese *sabar* icon ("Doudou N'Diaye Rose" 2014)) and those guys, they do it, clearly! It's right in your face. And so, we go, 'da dee da da dee da da (straightening the time somewhat now). Those are nine. Da da da da da da da da Da. Not faking. I can hear the music. It's very clear. This is the process. How long does that take? It depends on the individual. (Toro 2012n)

Concerns

This brings us to a few points of interrogation:

- Can this methodology be institutionalized at all? If progress depends on progressive, subtle, temporally un-plannable realizations concerning the nature of rhythm, might it be more suited to a mentor/disciple relationship?
- Can the nature and existence of Toro's aural experience be substantiated, quantitatively or otherwise? Herein lies an advantage of the self-reflexive approach. If I can generate an experience that seems to corroborate with his own, I can then attempt to describe the existence and nature of my own experience, lending support and description to Toro's. The problem here is that, though I have had a great many realizations while practicing and considering his methods, I still don't hear nine and fives and sevens all over the place. Once in a while, they do jump out at me, usually prompted by intellectual inquiry, but the experience *is* becoming more common.

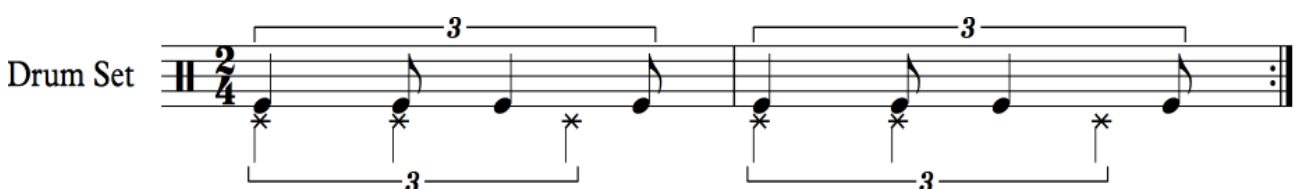
- One of the more controversial aspects of Toro's perceptual landscape is his categorization of rhythmic structures that can be heard and written in common time, such as the piano *montuno* referenced above, as related to more unusual metric structures, such as *nine*. This is akin to the previous discussion lending strong support to the idea that the *tresillo* pattern functions as a proximate three that has been quantized into an eight-subdivision cycle. But does this idea hold for many other such transmutations? If we just count the number of articulations in a relatively even melodic flow, such as *cascara* or the standard pattern, are those then representatives of the implied metric structure of the same number, or does this only apply to some, singled out by Toro's extra-normal rhythmic sense? I will delve into this question first.

(Your) Odd Connections to Everyday Music

The first section of *The Odd in You* has been briefly described. The second section of two, dubbed 'Combo Section', consists of seven sub-sections, corresponding to seven polymetric rhythm cycles. At the beginning of each of these, Toro gives an example drum set groove illustrating this alleged connection between the 'odd' metres and more conventionally used ones. Of these examples, one is written in 2/4, two in 3/4, three in 4/4, and one in 6/8. After the example groove and a few words about it, he presents several pages of exercises not with the groove in question, but with its more obviously polymetric counterpart, as ostinato. Some of these are straight polymetres as seen previously, others are embellished with added notes and/or rests. For example, in the first sub-section, 'Set 2/3 Combo', instead of the basic *two* and *three*:



Toro now prescribes this for the feet:



Figures 110 and 111. Straight *Two* and *Three* and Drumset Feet with Shuffle Bass.

The preceding pattern is quite common in African Diaspora music; it is very commonly heard, for example, played between the two hands in the *Mbira Dzavadzimu* repertoire of the Shona people of Zimbabwe. (Berliner 1978; Burns 2010; Scherzinger 2010) It is also a shuffle, albeit with the *three*

dimension included. This relationship is a common adornment in blues and jazz music as well, especially with *three* in offbeat position; this relationship can be seen above if we pretend that beat two of *two*—the third bass drum hit—is really one. Now, the *two* and *three* cycles line up not on the one but on the two of *two*, or the backbeat, an ever present accent in those styles. (Smith 2003) Note the offbeat *three* is also in the exercise below.

Normally, this would be notated in compound time—I would prefer 12/8. Toro chooses 2/4, with imposed triplets on each line, I believe, because most of the accompanying patterns he proposes relate to the *two* cycle. Here, as in all the sub-sections in the second part of the book, he brings in the idea of upbeats, from two metric points of view, and dotted notes. This is where the linear and harmonic conceptions come together; from a harmonic base, he takes one metre and explores it with downbeats, upbeats and dotted notes, to 'open perception'; practically, this enables the player to make phrases across bar lines, as discussed previously (“Linear Modalities,” page 153) while maintaining the harmonically conceived ostinato. Here are the first four examples from the first sub-section, to be played with the ostinato above.

Figure 112. *The Odd in You* Combo Section: Downs, Ups, and Dotted.



Audio Example 57. *The Odd in You*, Combo Section, *Two* and *Three* (CD Track 57).

He goes on into the other groups of three, with harmonic *five* and then *seven* at the end. This then is the basic format of the Combo Section of the book (though not the exact material). But what about the connection between common and odd or unusual metres? The first sub-section, discussed above, gives the tresillo, here called 'Spanish Rumba' by Toro as the example groove. The relationship of tresillo as a proximate three has been explored previously⁸³.

⁸³ It is also interesting to note that the dotted note on *two*, with *three*, as in the exercise, gives *nine* and *eight*, albeit over three bars. This is somewhat of a linear and harmonic perspective combined. Harmonically, this would happen if someone—probably a soloist—played triplets on the *three*, along with eight as a quadrupling of the basic *two*, i.e.,

In the third sub-section, Toro states, '4/3 on a Rock Groove,' and gives this:

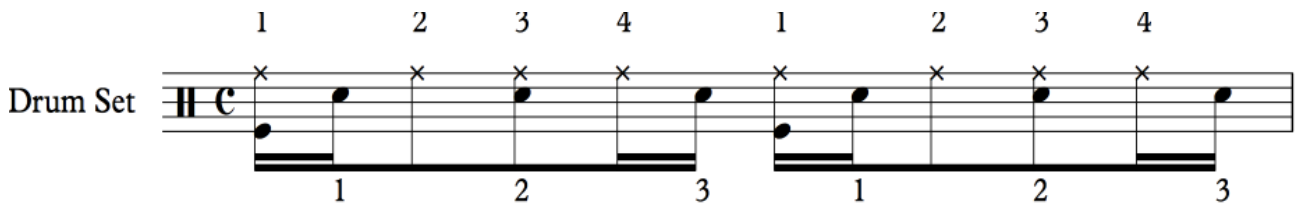


Figure 113. Example Rock Groove, *The Odd in You*.

In the description we find, “This is one of the first patterns that most drummers learn. Notice the 4/3 combination where the 3 starts on the upbeat.” (Toro 1994, 35) From the exercises that follow then, presumably the simple groove above is equivalent to system number 3, the upbeats of *three*, played against the *four* of the *four* and *three* ostinato:

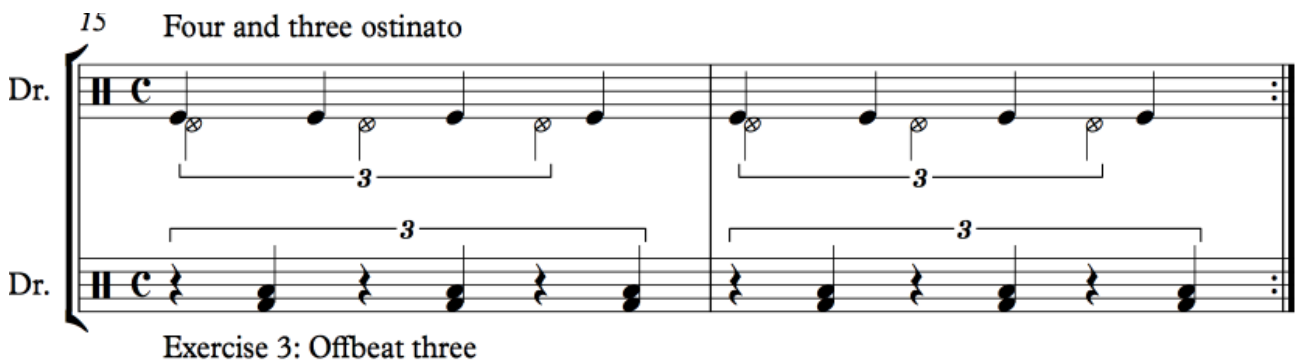


Figure 114. Equivalent Polymetric Exercise.



Audio Example 58. *The Odd in You*, *Four and Three* Combo with Number 3 (CD Track 58).

I've rearranged this exercise to match the previous Rock Groove in tempo and texture and repeated each a few times in a computer-generated sound file, as an example, unbiased interpretation:

sixteenth notes. Toro, referring to this combination, remarked simply, “Africa.” And, later, “So that's linear and harmonic at the same time. And that happens in Africa. You'll find that pattern. Unbelievable.” (Toro 2012b)

Figure 115. *The Odd in You* Rock Groove to Polymetric Version.



Audio Example 59. *The Odd in You*, Rock Groove to *Four* and *Three* with Offbeat *Three* (CD Track 59).

Now indeed the similarity is clear. The first is like a quantization of the second, the second like a straightening of the first. To my ear, the relationship is akin to those heard between the ternary and binary standard patterns, or between the three with two and the *tresillo* with two. The second pattern above has twelve subdivisions in the bottom, offbeat *three* section, so the relationship is similar to those mentioned. And remember, as with *rumba clave*, if we consider that the feel could be somewhere between these two interpretations, there is not so much an adherence to one or the other as a range. The strict *four* and offbeat *three* end of the spectrum is more difficult to conceptualize for most people; it is not the way we usually write music or program sequencers. Does this mean that the slippery, multi-dimensional, middle ground should lose out to a more linear, weaker intellectual concept of what rhythm should be? Certainly, part of what Toro proposes is an intellectual catch up in rhythm, to bring a more profound, intricate understanding consciously into the foreground, as western culture has done with harmony.

In the fourth sub-section, Toro considers, ' $4/5$ & $5/4$ on a Funk Groove.' He presents this pattern, which he labels, 'Funk, R & B, Pop.'

Figure 116. *The Odd in You Funk Groove.*

He says below, “There are so many ways to play these accents. Although there are a variety of different patterns and feels, what is important here is the phrase. These are probably the most used accents in all kinds of popular ethnic music all over the world. The pattern here is our idea in the U.S. But you can hear versions in styles like Son clave, Rumba clave, Bossa Nova, Samba styles, Candomble and Traditional Jazz from New Orleans, just to name a few.” (Toro 1994, 39) Indeed hearing these patterns in different orchestrations is an important step toward seeing that there is more commonality among the musics of the world than we might realize. Only since working with Toro did I realize that this common, basic, backbeat drum groove plays the so-called 'Brazilian Clave', also a foundational pattern of jazz.

This time, as the pattern is so close to five and four already, I might expect the foot ostinato to be something like this:



Figure 117. *Straight Four and Five Feet Ostinato.*

Toro elects rather to present this ostinato, the 'Mission Impossible' pattern, described above for his 'five epiphany' (“Toward What End,” page 161):



Figure 118. *'Mission Impossible' Feet Ostinato.*

It is over this pattern that he then gives downbeats, upbeats, and dotted notes, as per the previous discussion, then finishes off with the challenge of playing *seven* and *ten* with it. Although this seems to be one of the more straight forward comparisons, the ostinato pattern does not much resemble the groove pattern as in the previous example. In this case, I think the object is rather familiarity with playing in *five*, which can then be extrapolated to different limb and/or sound combinations. As seen in Toro's discussion section, this pattern comes in many guises. By understanding its *five-ness*, and being very familiar and free playing in five, it is assumed one would be able to adapt the feel and the choice of articulations to the common time version.

The last example I want to look at gives a similar presentation; that is, the groove presented is well known, arguably archetypal, and is somewhat different from the ostinato to be practiced. I find this

one yet more controversial, but worth investigating. The sub-section is titled, '7/4 on Afro-Caribbean Groove.' The groove is the same 'standard pattern' discussed in detail earlier.

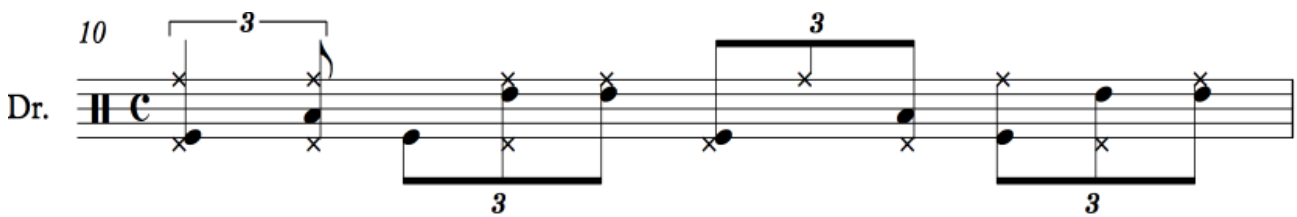


Figure 119. 'Standard Pattern' Drumset Groove.

In his brief discussion, Toro says, “Seven and five are accents often used in melodies because they do not represent the fundamental pulse of rhythm. In some cultures, like (those of) India and Greece these accents have become rhythms for reasons that are discussed in my book “All of Rhythm.” The pattern above is also multidimensional since it has all the rhythms from 1 thru 9.” (Toro 1994, 47)

As with the *five* and *four* example, the ostinato given for the exercises following this groove is not the polymetre given in the first, 'Basic Studies' section of the book. It is rather a *seven* pattern very much akin to the five, 'Mission Impossible,' or 'Take Five,' pattern shown previously.

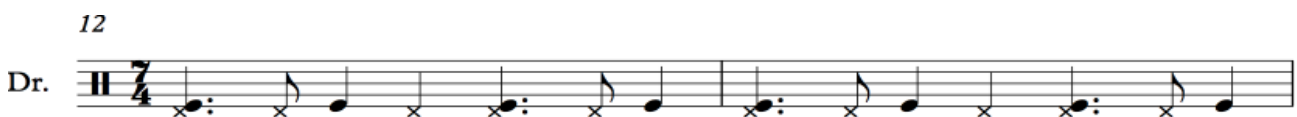


Figure 120. *The Odd in You* Drumset Ostinato in Seven.

More than arbitrary choices from popular songs, however, these patterns are highly significant in their own right, according to Toro. In the same way that we can look at five or seven in two halves, before and after the primary upbeat, he says it is also common, or 'natural' to use the dotted note, or *three* and *two* relationship, within these halves to express multi-dimensionality in an otherwise linear presentation. Notice that both the *five* and *seven* patterns shown above have the *tresillo* and *two* relationship in their first halves. That is if we consider the articulated notes. If we consider the underlying beat, the *seven* pattern above has four with the proximate *three* (*tresillo*) in the first half, then an actual *three* with *two* in the second half. To see it as a *tresillo* with *two* (or hear a *tresillo* with *four*), followed by three quarters of a *tresillo* is another useful perspective for me⁸⁴.

With this ostinato, Toro prescribes the usual downbeats, upbeats and dotted note combinations, then adds the harmonic *nine* and *ten*. This is a good deal of work with many realizations and challenges

⁸⁴ Toro of this phenomenon: “If you have two we put three. if you have three we put two. if you have four we put three. Two and three, two and three...threes and twos...” (Toro 2012b)

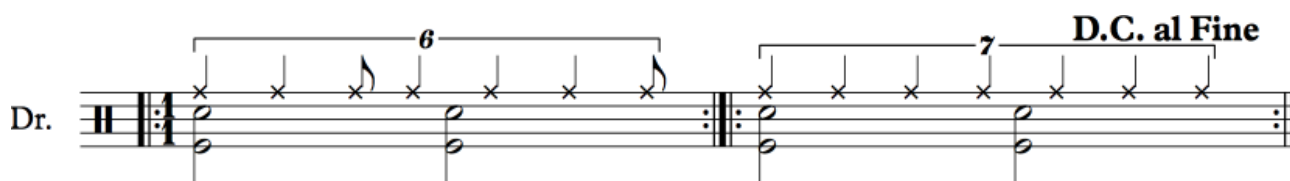


Figure 122. Standard Pattern to *Seven*, Over Primary Down Beat and Primary Up Beat.



Audio Example 61. *The Odd in You*, Standard Pattern to Seven with Downbeat and Up beat (CD Track 61).

Still, it is a stretch—literally and figuratively. As Toro says, it is a bit of a trick. Here is one of our early discussions on the same concept:

JD: Haven't you also said that the (*cinquillo*) is from the *five* archetype?

ET: Yeah, in one dimension. In one melody.

JD: Are those two different ideas that both work or are they the same idea?

ET: They're the same idea and one complements the other. It's kind of like a magician, you know, making one thing into the other, in the archetype. (Toro 2012b)

Dimensionality, Reality: There's No Box

For a long while this was one of those typical Toro responses that left me feeling like I must try to be content with not quite understanding, with having more questions than answers. Is the master just making things up to be mystical and therefore remain forever the master, or is the disciple not ready for the wisdom? It now occurs to me that as the material is multi-dimensional, so are the interpretations. As I get more familiar and capable with these polymetric combinations, I see that one idea can easily morph into the other and back again, as with the standard pattern and the *seven* metric cycle above. As they become comfortable co-existing in near simultaneous awareness (the degree to which they are sequential or simultaneous also comes with the deepening of hearing and physical capacity), it becomes possible to see, hear and understand two such ideas not as completely different patterns but as different interpretations; or, as two relatively near possibilities in the vast harmonic grid.

Verifying Perspective

As my familiarity with this multi-metric material and perspective grows, I do start to hear some of the odd phrases Toro has been talking about. 'Odd' here implies both 'unusual,' from our normal theoretical stance, and, not derived by the doubling of the *two* and *three* foundational metres. Usually, while listening, I get a sensation of flexibility from a good soloist's rhythmic placement or that, 'in

the cracks' feel that has been referred to elsewhere. Though it merits perhaps several more studies, I will include here another short timing analysis.

As Adama Drame was mentioned above as someone who loves to 'play *fives*,' I took a short excerpt of him soloing with his group on a song called, 'A Bissimillah,' from his album, *Live* (from about 1:03 to 1:06). (Drame 2004) I purposefully chose a section where I felt he was playing a continuous five in the space of two beats, marked the beats and the solo strikes and analysed the timing data. By the end, I started to wonder if it was not such an important discovery, the five was so clear. And, he does play them 'all over the place.' But that is the point: Until you have the perspective, you don't hear it so clearly. Here is a graph of that data:

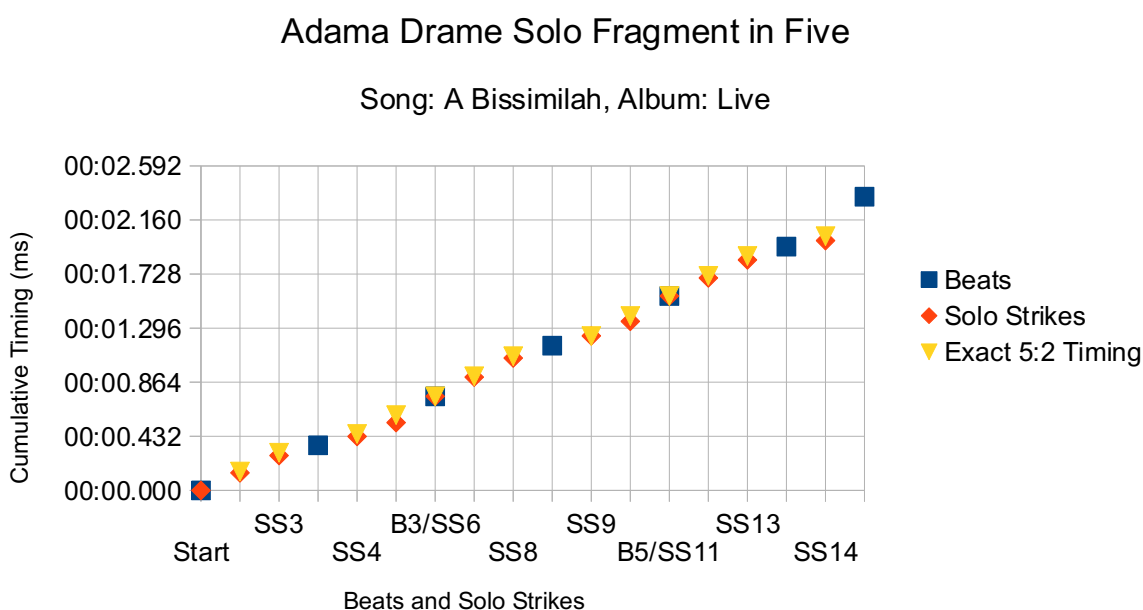


Figure 123. Adama Drame Solo Fragment Timing Data.

What is clear is the order of the solo strikes, played by Drame, and the beats, clearly articulated on a shaker. I did have to arrange them according to their timing values, as I marked the beats first and then solo strikes. The ordering fell perfectly according to the model, however. From the perspective of *five* we find: Together (beat one), two, three, beat 2, four, five, together (beat three), two, three, beat four, etc. The upward trending line also shows the continuous, near even progression in timing values. Also, note the flattening around beats two, four, and six—the 'in between' beats; this is because the difference in timing values is smaller, as expected, where these even numbered beats fit between the third and fourth articulations of *five*. Finally, I derived exact *five* timing values by calculating the length of each pair of performed beats and dividing them into five even units. As shown these values very nearly coincide with each of Drame's strikes, with the expected, slight, 'imperfect,'

human timing deviations discussed in section 7.11. I hope to present more examples in a future study, as this type of analysis accomplishes at least two important tasks: Verification of the harmonic perspective in practice, and fortification of the experiential foundation of this perspective in the researcher and reader.

Elasticity

A final concept I would like to discuss with regard to the harmonic perspective of rhythm is the idea of elasticity. I had felt this on occasion in my own playing, before ever hearing of Toro. It is the feeling that while improvising—whether creating a solo or variations in an accompanist's role—that I simply cannot go off time, or lose the feeling of the metric cycle. This means that I can bend phrases to speed up or slow down during their execution but never lose the sense of the one. I believed I had felt this occasionally because of years of exposure to multi-dimensional music. Also, in my nascent concept of the polyrhythmic nature of music that I liked, I had developed exercises of my own to work on deepening my capacity to switch from one rhythmic base to another. My exercises, however, were based on the subdivisions of the beat (see *gati* in the Indian music chapter). I would practice keeping a steady beat, emphasized with an accent or distinct sound source, and then fill the space of those beats with two subdivisions, then three, four, five, six, seven, eight and nine subdivisions. I had taught this to classes and individuals as part of a lesson on solo development.

The difference between my concept and Toro's, however, is that mine did not have a direct relationship to a particular metric cycle, or, to the *one* concept as the foundation, with a number of other potential metric cycles that unfold in the same space of time, as discussed throughout this paper. I left the metre to chance, usually defaulting to four or eight repetitions of a particular subdivision before moving on to the next, or, if working with a piece or recording, using the cycle implied. As mentioned, I feel this exercise still helped to feel a good deal of elasticity in my playing, and groundedness to the beat and the *one* of my default cycle. However, it left out the consideration of other cycles, which also left out fractional possibilities not covered in that sequential augmentation of subdivision method. My exercise and perspective also left out the fuller multi-dimensional implications of Toro's method. Let me explain.

If I am playing in subdivisions of one, two, three, and so on, as described above, their relationship to a metric cycle of *two* is two, four, six, and so on, or 2:2, 2:4, 2:6, 2:8, etc (beats:subdivisions). However, by thinking instead of a polymetric ratio, and incrementally increasing one of the factors, I practice and experience all the above and more. That is, 2:1, 2:2, 2:3, 2:4, 2:5, 2:6, 2:7, 2:8, etc. So, in between the first two possibilities in the former example, which represents my old subdivision exercise, I now experience 2:3; with reference to the original beat, I experience playing and

hearing a subdivision that is the same as the beat, then $\frac{2}{3}$ as long, and then, $\frac{1}{2}$ as long (doubled), then $\frac{2}{5}$ as long, $\frac{1}{3}$ as long, and so on. In other words, instead of these possibilities:

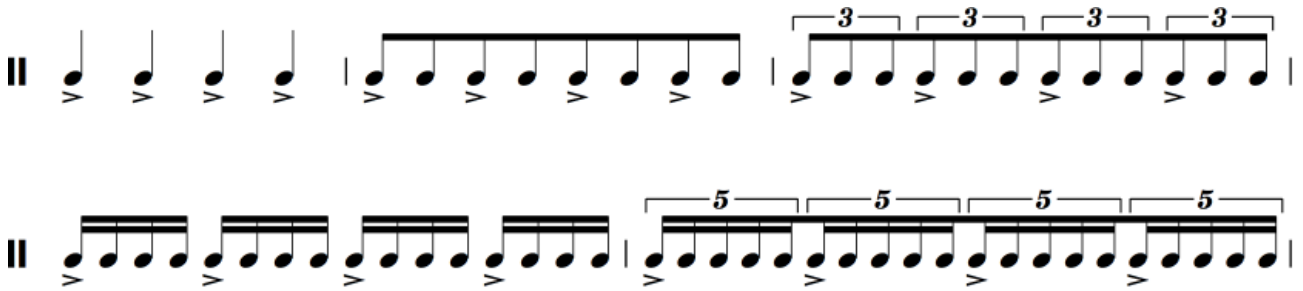


Figure 124. John's Old Subdivision Exercise (excerpt).

I get these:

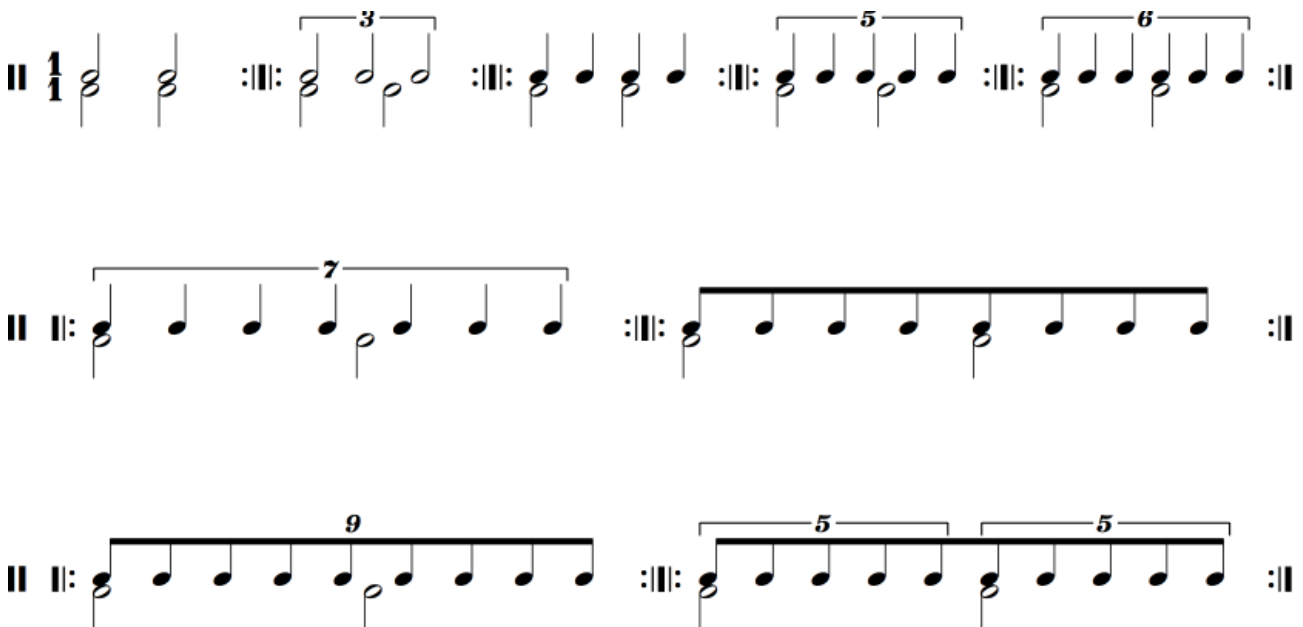


Figure 125. Multi-Cycle Exercise (excerpt).

Though the relationship between the beat (accents in first version, down stems in second) and the 'subdivisions' is the same in the first and last bars of these two exercises, the second exercise has four more relationships in between; these are the ones with *three*, *five*, *seven*, and *nine* on the top, the odd metres. This exercise as conceived by Toro would also have three along with the two as os-tinatos, or could have many other metric cycle combinations in that function, as described in the section summarizing *The Odd in You* ("Harmonic Rhythm: Toro's Approach," page 94). This approach is therefore not only highly multi-dimensional, it presents more possible ways to relate to the beat, even in a linear conception, by increasing the relative speed in fractional amounts. The gradations of 'tempi', relative to a fixed pulse are finer. These gradations are finer still when considering a

higher order base cycle, such as *four*; that is, between *four* beats and *four* beats doubled, we go through, 4:5, 4:6 (2:3), and 4:7.

This, incidentally, is the method preferred by Magadini (all cycles against *four*). (Magadini and Sykes 2001; Magadini 1995) Toro's method, of course, works in more dimensions, from many more base (ostinato) perspectives. This vast conception is made practical by working from motion, by learning to feel more and more distantly related motions by working through down, up, then dotted relationships, and a perspective of the *one* cycle, with its upbeat—*not* by mathematical calculation of subdivision groups.

The preceding discussion and figures might sound like the same information with new words, and in a sense, it is. The operative word is still perspective. Here I have tried to describe another perspective—the gradations in relative tempi—that has occurred to me in my experience with the approach, and I believe this perspective is largely responsible for the growing capacity I feel in being able to play with a strong sense of elasticity. I believe I hear a similar approach in, for example, the slow playing of Zakir Hussein⁸⁵. Toro also mentions this capacity, comparing it to the ability to slide or stretch notes on a fretless instrument, the human voice, the portamento effect on an electronic keyboard, and so on.

So, within that possibility (binary and ternary time), the problem is conceptually, how to do this (shows half note triplets and dotted quarter, dotted quarter, quarter, i.e., triplets and *tresillo*), and the grey area, that's the problem. And most drummers or musicians can't get themselves to do that. But natural musicians will do that, because their music is layered, and they have that. It's in it. I'm not subdividing. I'm not subdividing so I can do that. (Plays binary and ternary subdivisions over the *tresillo*/triplet bass figure. Does it again, faster) A guy like Paco (Paco Seri, Ivoirian drummer formerly with Joe Zawinul and others; ("Paco Sery" 2014)) or these kind of people will be able to do that. No problem. And I was just watching a video last night of him doing that on You Tube. It'll blow you away. Those guys have it. They have the ability to play freely here (shows board), because they can bend, up here (points to head). They don't know this (the board again, the theory). But we do. That's your problem, that's our problem in the western world. That we know this. That we're playing on those subdivisions. And there's no subdivisions. And the less subdivisions, the more colour to the music. (sings a melismatic line) A piano can't do that. Ok. Flamenco does that. Right? But American singing doesn't do that. It's our problem. It's this (draws a diagonal line). Portamento. They put that in an electronic instrument, because we needed to be able to do that. With pitch bend, but there's a feature called portamento, in midi, to accommodate. You can get it on a string instrument. It's the nature of a string instrument and our voice. Imagine if our voice was like a cornet, was like a tube. You wouldn't be able to do what we do. You do baa beee (low high) You see? You can slide, yeah. So, this slide is what I'm doing at the drum set. But my time is solid (laughs). So, you see? This is the kind of stuff that we like to get. And so, how do you get away from subdivisions? It's a difficult thing. To start, it must

⁸⁵ I recommend his *vilambit* playing, such as *Vilambit Impressions*, or *Jhaptal in 10 Beats*. (Hussain 2006, 1998)

bend. If you're playing (sings *tresillo* rhythm) and that's your subdivision (writes eights underneath), you're subdividing in that way (three, three, two). And also, when you do a triplet—da da da, dee da da—and your brain just can't let that loose. It's like water (?). But in mine, it's loose so I can just go from one place to the other. And it bends according to the environment; what I want it to be. It bends. But time doesn't go. It's a trick (sits down and plays the *tresillo* bass with sixteenths, triplets, fourteens as two fast sevens played in subdivisional groupings of two, two, three, and so on, smiles to show it is free and loose). You see? I do things in threes or in twos. And the time is there. But the thing bends. But the time doesn't bend. The time is...you have to let go of those subdivisions, but because you already understand what triplets and sixteenth notes are and you're wrapped (?) on it, I can show it to you. That's the problem. And so, we want to be able to do this (the grey area between triplets and *tresillo*), which is here (the portamento line), to go from one to the other with like...nooo problem. Make sense? So, you can take this idea (plays *tresillo* again) put it with a sixteenth note...see then we go to triplets...a little wobbly...if you try to go between sixteenths and triplets with a metronome you'll find it doesn't fit. You're having a little fight between the bass drum and the hi hat, a little hiccup (stops playing). My whole bass drum pattern changes to accommodate the triplet, so it doesn't disrupt the two. Just dance. So, you just have to negotiate the hi hat with that. Everything moulds, because you're elastic, and it should. A drum machine wouldn't, and you would hear it as flams. (Toro 2012k)

Besides the idea of elastic time, it is interesting in this passage to note Toro's continued, controversial position on the implicit/explicit nature of rhythmic skill acquisition. "They don't know this. But we do. That's your problem, that's our problem in the western world. That we know this. That we're playing on those subdivisions. And there's no subdivisions." What we know is our problem, he says. Yet his method advocates knowing still more—considerably more. And, because the student in this case knows about subdivisions (triplets and sixteenths), he chooses that avenue to present his case for elasticity, then again states, "That's the problem." Still, in the interest of knowledge, and especially, knowledge as our bridge to informed creativity, from an ever-broader palette, I would argue for Toro that this is the sometimes-difficult road to understanding. It requires us to use great discernment and arduous practice, yet the answer, the goal is forever 'in the cracks,' (or gap, see chapter 0, page 5) just outside of conscious, qualitative perfection. Perhaps he should rather say that there are an infinite number of subdivisions, and infinite degrees of shading in rhythmic placement.

Summary

In either case, this brings us to a summary of the method and findings of this chapter:

1. Beginning with a grounded, bodily, motional awareness of down and up strokes;
2. The next step is to explore the dotted note concept, developing a similarly grounded feeling;
3. This introduces, from a linear approach, a multi-dimensional perspective;

4. This perspective is deepened by contemplation—through extensive practice—of the simultaneous execution of multiple metric references; that is, one is not a deferential to the other but both (or more) exist in relation to their common cycle;
5. The multi-dimensional perspective is useful for musical comprehension on several levels of metric structure:
 - a. At the compositional level, it becomes increasingly clear that certain musics draw their aesthetic value by emphasizing more than one metric structure; this happens in the foundational accompaniment material—which for the vast majority of pieces is based on multiples of *three* and *two*—as well as in improvisational or pre-composed melodic material—which *might* include rhythmic structures based on higher order, odd numbers, like *five*, *seven* and *nine*;
 - b. At the level of feel, or groove, the interaction of especially *two* and *three* at the subdivisional level can be a helpful reference point from which to grasp various non-isochronous subdivisional groupings that appear—because of their uneven nature—to not be based on any theoretical, conscious, linear substructure. The perspective that their logic resides in the interaction of more than one structure, though not an exact formula, brings multi-dimensionality to this finer, conceptually undefinable level of nuance.
 - c. In analogous fashion, the assimilation of the multi-dimensional, multi-metric perspective allows one to develop an unwavering sense of the one, or resolution point of the cycle, and to access these various metric levels at will, even 'bending' or 'stretching' from one to another. The result is that time seems not to be divided in discreet units, or subdivisions, as it would within a linear, one dimensional concept, but to be elastic.

Analysis of Results

As was stated at the beginning of the last chapter, much of the theoretical analysis took place in that chapter, in dialogue format, dovetailed with the findings of the investigation. I felt this was a logical format as the 'findings' are mostly concepts and ideas. My interpretations and personal analysis of them has had to serve as the results of this study; given the nature of the material and the methodology chosen to interpret it, this exposition and interpretation of the harmonic perspective of rhythm is the result of long hours spent with Toro, with his books, methodology, ideas and concepts. As explained elsewhere, however, the material and application of it only becomes clear through experience. I cannot expect the reader to have the experience that I do or to interpret it in the same way. I have therefore done my best to explain—to analyse—how the ideas are meant to enlighten rhythmic practice. Put another way, I needed to analyse the harmonic perspective of rhythm to help explain what it is and, whether and in what ways it seems applicable as a theoretical lens through which to understand rhythmic practice.

As proposed however, the hypothesis under scrutiny is whether the harmonic perspective of rhythm will prove of significant value in the rapid acquisition of an extant, relatively unfamiliar, rhythmically complex music system; in this case, Indian music as played on the *tablas*. Evaluation of this practical, specific application is the focus of this section.

A Dual Approach

It should also be clarified that my experience has been of a dual approach. I first worked on Toro's ideas and formulated the study, then began Indian Classical study under Pillay, then had the opportunity to learn from Toro personally. The *tabla* study was concurrent with my lessons with Toro, my subsequent period of transcription, digestion and analysis of Toro's ideas, and throughout the writing of this dissertation. I still have moments of inspiration and confusion with both methodologies, as is to be expected with any profound system of knowledge. In addition, I have been deeply interested in rhythm, especially of the older, AT/M systems of the African diaspora and Indian subcontinent for over 25 years, and have had the inclination, albeit it largely in the background, to explore connections and similarities between repertoires with which I am familiar, and thus potential universal theoretical stances.

Consistent with the views espoused in the section on subject-centred ethnography, and especially self-reflexive ethnography, I have therefore eschewed any suggestion that my results are somehow 'objective'; the value of this section is to be found in carefully developed reflections on the combination of the aforementioned experiences, rather than on some sort of strict hypothesis test. Such a test, theoretically desirable but highly impractical, might involve a large sample of learners, perhaps

of different age groups, that would be divided into control and experimental groups; the latter would be trained in Toro's methods, the former in Western concepts or perhaps nothing at all and then both put through an Indian or other extant rhythmic training. This idea is interesting but inconceivable in my case. I imagine such an undertaking would be flawed by expense, dubious conflicting variables, and even ethical considerations⁸⁶. I have chosen from the outset therefore to reflect on my own experience, and rely on judgement—the readers' and my own—as to which ideas are valuable and worth pursuing in future studies and/or attempts to develop rhythmic mastery.

Parallels and Clarifications

As the chapter on Indian rhythm has perhaps made clear, there are a number of parallels between Toro's ideas and those of the Indian guru. Toro admits as much when he says, “This (the downbeats, upbeats, and dotted note) is a Hindu idea, on a harmonic basis.” (Toro 2012n) So how has the methodology and perspective it imparts helped in my own quest to learn Indian classical rhythm?

The most significant factor that Toro's training has imparted to my *tabla* study is the awareness and pursuit of efficient motion. At some levels, all musicians search for this in order to progress, as I did, but it was Toro who spelled a few things out for me in ways I had not fully comprehended before.

First, the idea that there is a universal concept of proper motion. The movements required to strike a tennis ball and a *tabla* are not the same. However, the idea that a centrally initiated stroke, transmitted to a loose, reactive limb combination is informative at this more universal level of inquiry.

There are those who will disagree, saying that the strength of the intervening movement units such as the wrists and fingers need to be developed for certain movements, especially perhaps, fast playing. There is a plethora of this sort of advice in the internet forums of stick percussion players, for example. It is the method of piano pedagogy still emphasized by some teachers. And, I would not disagree entirely. Even Toro suggested that finger strengthening is ok, but not as a substitute for full, well considered motion. In my lessons with Pillay, we have gone back and forth on this issue. But, in a recent discussion I asked him about strengthening the hand and fingers with a gyroscopic device used by rock climbers and other athletes to improve grip. He replied quite sternly that this is a *bad* idea, and that the hands must be weak and floppy, the strength coming from above. (Pillay

⁸⁶ If I were to work with underage subjects, for example, might I risk cheating them of the best possible musical/rhythmic training at a crucial stage in their development? If I chose those inclined toward alternative approaches as offered by the theoretical stance under scrutiny, I would introduce yet another conflicting variable into the mix. The choices of theoretical outlook and of repertoire/musical tradition—i.e., western classical, Indian, African or other—are, I believe, best left to the individual. This study is meant as an aid in those choices.

2011) This echoes Toro's observations about conga player Giovanni Hidalgo (with no sexist intent on my part):

ET: ...the energy's released on the joints; if it's stiff, there's no way to release that energy. And you can get very strong, even, like that... stamina is very different. I'm sure with a million hours you could get very good stamina with very stiff (motion), but joints are there for a reason.

JD: And you've said Giovanni's super strong.

ET: Ahh, ridiculously strong. Ridiculously strong.

JD: But also super loose? ET: Here, this (forearm), is like a girl. This, there's nothing here. You touch this thing here (shoulder), it's like metal. This (motions over shoulders both sides) is like metal.

JD: So, you think that's because he's using the right technique?

ET: Well he's developed the technique since very young.

JD: He's using the technique that you're describing?

ET: Always. (Toro 2012o)

Leake, in his well-regarded *tabla* textbook acknowledges this controversy in the *tabla* communities as well, and seems to fall on the opposite side:

A major area of discussion (and controversy) for *tabla* technique has to do with how much movement is necessary from the arms, hands and fingers for producing any given stroke. Certainly, within the various *gharanas*, there are subtle differences regarding the physics of actual hand movement. Generally speaking, there is a tendency to use too much arm movement from the right hand... In the context of actual playing, the arm moves in conjunction with the strokes, but ideally, from the elbow down, the hand should move as minimally as possible for producing *bol* combinations cleanly and, most importantly, very quickly. Too much unnecessary movement will slow one's technique. (Leake 1986, 52)

In my experience thus far, I feel that Dr. Paul Renan's advice, mentioned in the motion discussion ("The Power of Motion," page 154), connects these ideas in such a way as to logically support both. He told me that from his Alexander Technique training, he conceives of piano technique in circular motions, but that at speed especially, these motions are internalized—felt and not seen. Renan also emphasized the feeling that one is playing from the shoulders, or even the stomach. (Renan 2002) Thus when Leake says the arm moves with the strokes but the hand should move minimally, I interpret this to mean the movement is internalized as discussed by Renan. This feeling has been key in my progress and allows me to connect with the rhythmic material to a greater degree as my awareness is connected to my centre, for each limb, not limited to my fingers. The most successful approach for me on the *tabla* has been to warm up each finger in succession, concentrating on and exaggerating Toro's version of circular motion at the elbow to produce downward and, with some strokes, sideways motion at the fingers. ("Split-Finger" 2014) I then practice down and up strokes

in finger combinations (finger 1 with itself, with fingers 2, 3, and 4; finger 2 with 1, 2, 3, 4, etc.) This is my own shortcut/preliminary exercise on the *For Your Hands Only* approach, depending on the time available. Key to this warmup strategy, however, is intention to develop continuous awareness of the body/finger connection. As Toro says:

ET: ... What we're trying to do, is get this (shoulder) to move your arm, not this (wrist). This does not generate any motion, at all. This (wrist, fingers) is just a recipient of strength. This strength comes from here (shoulder). Notice the difference? (Toro 2012o)

ET: So the idea of a stroke is this (two hands down in centre, wrists bend and hands come down last), always. It's not like this (wrists anchored on drums fingers going up and down). And that's universal for any drum you're playing. And this (elbows out), you see a lot of Hindu players playing like that. It's just for show. This (forearm) has to go down. Same thing if I was doing that with the stick. It's the same thing. No difference. No different from playing the drum set or a conga drum. So here comes the heel-finger. This is the heel-finger action. Same idea. This is the universal technique.

JD: So could you say the *tabla* does this type of heel-finger but it does sideways as well?

ET: It's not. It's always the same idea, but it's a universal stroke, and if you don't get it, you don't connect. If you're playing *table*, this thing (wrist) is down here. It's down here, resting. This thing is resting, and it just comes up to do the stroke. Like in the congas, like anything. Its resting. You're at rest and there (stroke, stroke). Because the stroke comes from your chest, and not from your fingers. Somebody that plays, somebody from India might tell you, it comes from the fingers. No...you're nuts (chuckles). Strokes come...the energy comes from your chest. That's where one is.

JD: How about from your stomach?

ET: Yeah. From the centre. So, what you should be concentrating on all this time is the mechanics of this, nothing else. You leave everything out and concentrate on the motion. Once you understand the motion, anything that you know...you put motion into it...and the sound. Actually, the motion is inherent in the stuff you're doing. It's just a discovery. Little by little by little, you discover what is, and that's a trip—it's a life—of discovery. Be free. That's why the technique of this (*tabla*) is just...lightyears ahead. If you get this technique, any other technique is like, ahhh. When you play these drums, no matter how small you're playing, that's how it should feel, BIG (full, releasing motion). I would do this kind of stuff, until you feel that there's motion, that there's a groove, that the hands are going by themselves. (Toro 2012b)

Mind

What is more, these ideas, for me, extend beyond technique. The continued cultivation of awareness during practice and performance has offered me a portal to enter into a centred state of mind, from which it is more likely the material I am engaging with, be it conceptual or memorized repertoire, will flow smoothly from the mind. This is akin to the ideas of pianist and writer Kenny Werner and those of numerous other performers about getting into the 'zone.' (Werner 1996) This state of awareness has of course been bolstered by my own engagement with meditation practice, and with Toro's multi-dimensional practice methodology as well. As discussed in the previous section, from

motion we proceed to the combination of motions. The following are some of my own reflections taken from my notes:

March 4, 2013: According to him (Toro), Zakir Hussein, perhaps considered the greatest living *tabla* player inside and outside of India, has said that playing his *tabla* is his yoga. Not an idle statement from someone who grew up steeped in Indian tradition and capable of demonstrating such skill and inspiration at the instrument.

In a complex task such as playing a musical instrument, one tends to think, as I have spent more time than I care to admit in my practicing attitude, ‘How can I think about oneness and complete awareness when there is so much else to think about? This is precisely why Toro advocates working on the awareness state every day, as your starting point. This might necessitate working on simple material. But if in the aware state you can progress to something more difficult, you do so. I am certainly still tempted to progress (sooner than indicated above) after spending some time on simple tasks in awareness; after all, it’s not going to come all at once. I think this is ok, as long as the awareness state is close at hand, which implies close at hand! The idea, at least for me these days, is to be there or heading there more often. By always starting there, you get more experience finding that state of mind and hand, as well as remembering that’s what you want to feel all the time. One could argue that the quickest way is to learn to only play in that state and not progress to complex material until you can do it in the correct way. But there are those of us who must also play in public and therefore rely on a store of learned technical and mental devices to fill in the gaps of aware, timeless music making. Gradually, I am learning to feel more fully even as I play familiar patterns and phrases. Of course, one could stop public music making to complete their awareness training. I believe Sonny Rollins did/does this on occasion?

March 11, 2013: As with previous notes about the union of mind and body, creating the conscious oneness state, the union of awareness of different metres, such as two and three subdivisions as combined creators of groove (feel), engenders this unified but multi-level awareness which makes groove so attractive and powerful. (It) Actually stimulates creative thought—creation being the joining of more than one point of view or mind state, thus embodying the same multi-dimensional concept.

March 19, 2013: Motion today feels like another gear. A slower dance. This corroborates with what ET said very well. You play from above, as he says, because you throw those bigger motions from there. These (shoulders, hips) are like the higher gears. You time them right and the rest follows. When you speed up to a certain point, it’s like you switch gears. Then your motion slows down and you dance between these throws. Then you might speed up until it’s time to shift again, depending on how many gears you have! Don’t take analogy too far, but very useful. (This) Sounds like a drummer’s manual but the autoethnographic point is that the feeling of it is so wonderful. Not only for its inherent healing properties (coordination of muscle groups, like dancing, running, rhythmic breathing in Yoga practice) but for the feeling of another dimension, another gear, where the movements are slow.

...awareness of body is inseparable from awareness of mind. It is the same. Awareness can be elsewhere—on the future or past, on fantasy or calculation—and all these things, in moderation, are necessary. But playing requires the awareness normally spoken of in meditation contexts: What is the mind doing now? What is body doing or feeling now? It is this type of awareness that reaches toward a connected experience, where mind impulse, body response and sound production become one, unified act, not separate thought trains to be pondered. These separate thought trains as well are necessary in moderation. But the re-unification of them is the goal of musical and meditational practice. Theory can distract. (Drace 2013)

Here is a possible strategy to bridge the explicit/implicit knowledge gap. Through keen, purposeful, pointed awareness of actions, perhaps more accessible to children, it might be possible to make the transition from explicit knowledge, or ideas, to implicit knowledge, or skill, more quickly. This indeed is the process of effective practicing. It is not a new discovery. Perhaps in verbalizing it here, however, the idea can help those who do not stumble on the process naturally.

Dance

As for the concept of gearing, Toro said on several occasions, the faster you play, the slower you think. (Toro 2012g) Thinking here refers to the conscious initiation of movement. This opposition of related speed measures (they are measuring the same event from different perspectives) implies some sort of ratio. The ratio, in this case, is created when multiple strokes are generated from well-executed motions. These 'higher gears', or those that move more slowly—shoulders and hips—while driving the subordinate, faster moving hands, wrists, fingers, knees, ankles and feet, interact in the centre. This is not a cognitively driven act but very much like dancing at the instrument. This, for me, feels like the only way to produce a solid groove with good feel and timing, especially with complex material⁸⁷. Here are a few Parallels from Toro's Caribbean perspective:

I have more knowledge than most people, and I don't find it to be a contradiction. Why? Because I come from the root. I come from hearing the music, feeling the music, because I could dance, since I'm little because we could dance! We had to dance. It's the only way to...if you go to a party, you have to dance, if you couldn't dance you were poop. Not only that, you were unhip. You see? You were unhip. "Wha'?' You don't know how to dance? So unhip!" Do you see? You don't want to be unhip, you want to dance! But today, it's unhip to dance. So how can you play styles of music where you don't move to it? It's crazy. The world makes no sense. (Toro 2012l)

Toro has influenced my approach to the *tabla* with his recommendation to always keep time with the feet. He claims that great Indian players do this as well, or with the whole body. (Toro 2012d) This seems cumbersome while sitting in the usual cross-legged position, but I have seen some who manage nevertheless. A normal approach to internalizing the time is to keep *tal* with the hands while reciting compositions. I cannot say that adding the feet is essential or better, but it has certainly helped me to practice a composition, at the instrument, in relationship to the time, as kept by the feet. This I feel should be done in addition to *tal* exercises, as in the "Example Exercises" section on page 65, as well playing to an external *tal* source from a metronome or friend. Playing with

⁸⁷ Toro told the story of a student who made the following observation: "So he says to me that I move too much when I play and that it affects the music. I said, 'Of course! That's why I move!' (all laughing) That's exactly what he said to me, 'You move to the music, so you know, it affects the music.' (more laughs) What an observation!" (Toro 2012k)

the feet also opens up a vast array of alternative performance approaches. Though almost all *tabla* players still choose the traditional cross-legged position, I showed Pillay a wooden platform I created to hold the *tablas* on a snare drum stand, facilitating the use of the feet in a drum kit hybrid setup. He was very open to the idea and enthusiastic about the possibilities. Regardless of individual stylistic focus, the application of motion is an ongoing, lifelong study that figures into all subsequent observations.

The Universalist and the Pluralist

The theoretical applications of the harmonic perspective of rhythm for learning Indian rhythm are numerous. Although I am lately experiencing a more peaceful resolution between the technical/analytical and the traditional/repertoire approaches, it was not always so. I sensed a possible resistance on Toro's part to the traditional way of teaching multi-dimensional rhythmic music, i.e., the learning of compositions, in the Indian context or other contexts. As mentioned in, "A Dichotomy" (page 75), encountering this attitude from such an influential mentor originally caused me some distress. For me, discovering traditional music in context—African, Caribbean, now Indian—has been one of life's great joys. The dress, the function, the sacred or secular context, the dance, the food...all these elements make and enrich the experience, not just the technical or compositional brilliance of the music. This difference in perspective seems to bear itself out in our different approaches to learning the *tabla*.

For three years now, though our lessons have been sporadic at times, I have been learning *tabla* from a *guru*, in the Indian system. This entails learning the sounds and names for them, and learning compositions and fragments thereof. There has been discussion, largely initiated by me, as to the intricacies of technique for speed or sound production. This has been a hybrid experience of sorts: It took place in South Africa, in intermittent lessons and classes, with a teacher who is primarily a vocalist in the South Indian tradition, on a percussion instrument of the North Indian tradition. Still, Pillay is an excellent percussionist, a child prodigy who spent many years in India and earned a Master's degree in performance there. (Pillay 2011) He is also determined and apparently knowledgeable enough to combine the South and North Indian approaches to rhythm. He has been introduced in lectures as 'South Africa's genius of Carnatic music.' (Pillay 2014) Thus, I am assuming his knowledge and approach is relatively comprehensive and informed, if not typical.

Toro, on the other hand, took two lessons on *tabla* and then moved on, creating his own approach based on his experience and ideas about rhythm and music pedagogy. The passage below illustrates much of his position on the traditional approach.

JD: So, I have my composition that I'm learning. Traditional. Should I just not play it at all, or should I do this (motion exercises) for 30 or 40 minutes (per practice session) and then try and see if the motion still feels like it's there? I'm asking because you might say, "No! Don't do anything else for a month!" Or you might say just feel it out on your own.

ET: You can do whatever you want, but the thing is in...technique; the technique should start from the beginning, not from compositions. It's just nuts, for me. That tradition is nuts. I think that's why it takes so long. Why don't you develop technique? You know, develop vocabulary. It's just the way that we teach is...there's something wrong with it. Compositions...it's the way we've been doing things. You're encountering differing technique levels depending on the compositions. But the compositions don't teach you how to practice. You just practice compositions. That's not technique.

JD: So, if you're lucky you'll figure out the technique.

ET: That's right.

JD: Maybe people teach the compositions because it keeps it interesting...because you're learning music instead of...

ET: Instead of learning rhythm, haha. Which is...heavy. So, I'm going to play you rhythm, not composition (improvises for about two minutes). I didn't need a composition to play. I need to have some kind of creativity to play. How to put your words together to mean something. To say something. But I'm not thinking of a composition of a musical statement or a tradition at all. That's confining. That's ok to be a traditionalist. They're, you know...you need to start when you're little to learn those traditions. It's crazy (laughs). I just don't...I see the whole thing really open. Very, very open. If I could take this instrument, and play and express myself, then I'm happy. How can I do that? There's some basic techniques, some basic ideas that I use. It took me a couple years just to do this (taps na/ta with right finger). It took me a long time—two years—just to do this. And it took me more than that to feel that this is here (indicates abdomen with full hand). But I'm doing it with the same technique I play the drum set or any other instrument. No different. I need to get that stroke. The other one too. It took a long time to feel that that had some strength. You need to get that. You need to get this (left hand) to feel that there's strength and tone. I see that, and I do the exercises. I take the technique out of the music. Music, nnnhhe (slightly perturbed? nasal tone). Listen to the music, enjoy the music, and spit out music when you play. But when you're not playing, don't try to play music. Try to study the instrument, to get the technique so that when you want to play music, you don't have to think too much about technique. It's not in your focus. Your focus is to try to make a melody. (Plays a bit more.) They can't do that (fast doubles on left; plays more) I'm playing...threes and fours...and twos. They can't do anything like that. Their hair will just fall (laughs), their brain is just fried. It's that kind of stuff. So that's in that book (*For Your Hands Only*). Its heavy what comes out. Really, it's amazing what comes out. And so, you get so much more out of the instrument with that book. Right away! (Plays down, up in right hand with one of his 'groups of three' in left.)

JD: Groups of three.

ET: That's right. See? You're getting this stronger and stronger (right hand motion). (Plays more combinations while calling out 'fives,' seven,' etc.) That's *For Your Hands Only*. That would take you ten years studying Indian music. And you'll never get to something as complex as that. So that's my point.

JD: And you think that your stuff covers everything that they do too?

ET: No. Because that's dogmatic. And they have phrases...they have phrases, they have certain things that are from a particular culture. And...no. This covers all the universal ideas, and beyond. And, will facilitate your technique to play what they want you to play. Because they don't give you exercises on do this or do that, it's just not there. A book of technique, no. A book of compositions. (Toro 2012c)

It is clear from this passage that in Toro's view :

- The traditional Indian approach to learning rhythm through compositions is slow and inefficient;
- It does not lead to a simultaneously rendered, multi-metric capacity, as his methods do;
- It does not teach students technique for its own sake; students are expected to figure out what they need to perform the compositions;
- His own method will not teach someone to play Indian music or to sound like an Indian musician;
- He is interested in universal concepts, not culturally specific concepts or phrases;

As stated above, however, I am very much interested in playing Indian music, more or less like it is played traditionally. I would then like to be able to take that knowledge and combine it with other knowledge, other techniques, and other instruments to produce new musical hybrids, and to expand my own voice. Toro's method is generally aimed at a similar, cross-cultural, 'modernist' goal, but he sees the route to that goal through the discovery and mastery of everything universal—in extant musical practice and beyond.

ET: See, this is the kind of exercises that the Hindus don't give. They never give the exercises. So, there's a series of strokes—same thing with conga drumming or whatever—they don't give you the technique. They give you these patterns to practice.

JD: The material and then you have to find the technique in your body.

ET: It's crazy. It doesn't work. It takes an eternity.

JD: But do you think you need some of both?

ET: No. Not for us. For them, yeah, if you want to grow up in that tradition and spend 30 years learning how to play a thing, then you do that. So, I see the technique. The technique is that. The technique is this. It just has this stroke and this stroke. And you think how are you going to get proficient in one stroke? It's not going to be ten years from now when I have enough compositions that I figure out one composition, no. I can practice one year and get this stroke pretty fast, so I can do things! To play musically. Right away! Instead of waiting five to ten years to be able to do something. Not only that, at my age, I know things, that I can use... (plays fast with rolls on both hands, polyrhythm). You don't have a composition that has that. It doesn't exist. Do you understand? And so, where are you going to get that technique from? Nowhere. Nowhere. And so, it doesn't work. It works to play Indian music. That's cool to play that kind of stuff. It's a different ballgame. It's just a completely different

thing. So, if your technique only works for playing one thing, I think...I mean I don't think much of it because we're not in that kind of world. You know? Like your language is only good to communicate with your people. The only language that is universal is numbers. Music is not. To call music a universal language...So that's my two cents about the technique and traditional technique. It's great to play traditional music.

JD: Well, I'm taking it all in and maybe you have some thoughts on this: It's put me in a sort of existential debate. I'm just kind of cut loose from my moorings because in the past I've liked traditional music, as you know, and that's what's given me passion for music. And now, I see what you're saying and I'm agreeing with it but I'm like...oh...where does the passion come from? I'm sure that's part of the growth process.

ET: It comes from being able to speak, to play, across borders, you know?

JD: Yeah. But do you agree that it's a long road from my perspective because exercises, at least at the beginning are not always as inspiring as learning a phrase or something that sounds like music. I'm not disagreeing with what you've been saying, I'm just saying to come to your perspective...well, here's another perspective: You've come to this perspective but playing a lot of music, right? A lot of tradition. Caribbean music. You started in music but then you were able to come to this bigger perspective.

ET: I noticed very early on, in my teens, I noticed there was something universal about music, and it wasn't music (laughs). There's something universal about it but it's not music because music is not universal. Music is very prejudiced.

JD: Yeah. And I'm not disagreeing with you, I'm just telling you my mind state. I was thinking on the way over, prejudice and passion go together, right? Whatever people are more passionate about, they're prejudiced about. I love you or I hate you. That's what gives you energy to work it out.

ET: We defend our point of view. We're nationalistic. We're like...I saw that very early. There's something weird about this. The only language that is universal is math...its numbers. Not math. Numbers. Numbers. You see the numbers in music and you see what's happening. Picasso saw shapes. The shapes are universal. Art is not. (Toro 2012d)

Toro shows consistency here in that what interests him most are the structural elements, like the harmonic series, and not the idiosyncratic ways in which those elements manifest in different musical styles. But his conceptual vision is the result of exposure to rhythmically multi-dimensional music. And, those players that seem to inspire him most such as Hussein and Hidalgo, also come from AT/M traditions of learning. But, in his mind at least, they also have gone beyond their traditions to create something more universal. Other people might say they are the torch bearers, extending the possibilities as happens in every generation, but Toro's interpretation and vision is more in line with his theoretical stance.

JD: Do you foresee...I don't want to use the word tradition, but something; since you say music is just a little bit and rhythm is big and you like... (that is) you play rhythm, not music. Do you foresee a culture of that?

ET: I hope so.

JD: Is that what you want? You want to train people around the world to play rhythm, not music?

ET: Well when you (hear) Zakir and the masters of percussion, they're playing rhythm. They're playing rhythm. It so happens that the basis of their music and their melodies are based on this thing, you know? But they're playing rhythm. And they get very deep rhythmically. You can't help it because your mind wants to associate it with something and you make music out of it. And they might call it music but they're playing rhythm. (Toro 2012d)

Though I am nowhere near the level of Zakir Hussain or Toro in my playing or experience with music, I do have to make my own choices about my own learning trajectory, based on what I perceive and experience. My observations therefore differ somewhat with Toro's, even given the considerable, fascinating, substantial insight I have gained from my experience with him. First, music, even purely rhythmic music, is composed not just of rhythms but of different sounds. Though I have experimented with applying Toro's methods directly to the piano, for example, the large palette of pitches and harmonic implications makes it quite difficult to work with anything near 'every' combination. With only a few combinations, the permutations of one exercise through all the chords of a jazz standard, or all the notes of a scale, quickly becomes overwhelming; and I am more patient, I think, than most. Similarly, on the *tabla* there are many fundamental sounds (about eight in my work with Pillay, not including those composed of two sounds played in unison; there are more in other sources as well). I find Toro's exercises very useful on *tabla* and use them a lot, but the experience of playing compositions gives me a different insight as to how I might combine those sounds. Turning to the language analogy again, it is by rearranging what we know that we use words and ideas fluently. What we know we got by mimicry—of sound and syntax—until eventually, we could start rearranging simple words and structures to produce our own combinations. Toro does advocate lots of listening and visual observation of whatever music one is interested in, which is very helpful, even necessary. However, I do not think I would be ready to copy a *tabla* master like Hussein without the help of a good teacher to get me started on idiomatic phrases, good sound and technique on the instrument. This is in addition to my previous observations that I *like* the experience of working with a *guru*, in a semi-traditional environment, and I like the excitement, the challenge and the intrigue of trying to master a new phrase, exercise or composition.

It is no surprise then, that what appeals to me most is a combination approach. This was necessary to compare Toro's and the Indian perspective, but I also find it satisfying and productive. As Toro said of his own approach, combing linear and harmonic playing, *ala* Indian and African music, "More is more." "And, the more you can do, the more you hear. And the more you hear the more music you can play. Because you hear it. And more is more." (Toro 2012l) Toro's skills, ears and confidence—and *perspective*—are perhaps strong enough that he can listen to someone like Hussein, understand everything and take from it what he needs. He has been at it for a long time,

rhythm *and tabla*. I am not as confident; I also enjoy the experience of learning from the source, and paying homage to the cultural context from which the music springs.

I do acknowledge that Toro's approach is more efficient, from his perspective. As a studio musician in Los Angeles for 22 years, he had to be a master of the quick study. He had to know how to reproduce the feel and sonic approach of any style required. Though I did not ask him directly, I am almost sure this experience was a precursor to his universalist notions of music making. Moreover, his 'culture' seems to be that of a small group of elite drummers and percussionists—high level, professional, touring and studio musicians—perhaps more so even than that of his native Puerto Rico. This makes his outlook seem logical. He is not interested in becoming an Indian Classical musician, or a Brazilian, Peruvian or Spanish cultural musician, though he has spent time fitting in to those styles, at a professional level. I struggle with this dilemma because, perhaps more of the ethnographer, I like to get close to insider status, even when I know that: 1) I never will quite get all the way inside, not being from the cultural/linguistic matrix of the chosen, 'other' culture and because; 2) I can't seem to commit to only one.

In some sense, this perspective, gathered in the process of learning from Toro, undoes the proposed hypothesis; Toro himself says that his method will not teach someone to play Indian music. For that, he says, “You must start when you are little.” This implies that you must go about it the traditional way. Still, implicit in the hypothesis is the question of how much the harmonic perspective could help and in what way; or, if one is steeped in the harmonic perspective of rhythm, will the study of Indian music, with all its intricacies and rhythmic manipulations, make sense from step one and all the way through?

Direct Applications

I have already discussed the value I find in the motion concept and related focus on awareness in my approach as an adult learner of *tabla* technique (or other performance endeavour). Another aspect in which the harmonic perspective applies is the simplification and codification of the process to become linearly fluent in any metre. This was covered in the previous section, “Linear Modalities” (page 153), but for the sake of the present discussion, a short example is in order. If I wanted to explore the possibilities of *Rupak Tal*, in *seven*, the traditional way would be to learn its *theka*. This would be recited with the voice while keeping *tal* with the hand gestures. Next, some variations would be learned, and then perhaps some compositions—*peshkars*, *kaidas*, *relas*, *gats*, etc. Leake presents this process over eight pages devoted to *Rupak Tal*. (Leake 1986, 206–13)

How might Toro's approach work? First, one would spend lots of time working on the motion of different strokes on the *tablas*, as in *For Your Hands Only*. (In the traditional example, it was also

assumed that lots of experience had been logged playing traditional *thekas* and compositions in other *tals*.) Assuming the technical capacity is relatively well in order, then, the approach might be a modified version of that seen in *For Your Hands Only* or *The Odd in You*. We have seen the example for developing one's capacity to play in *seven* in, “(Your) Odd Connections to Everyday Music” (page 189). This involves a foot ostinato, then with the hands, playing downbeats, upbeats, groups of three and then possibly a harmonic relationship, such as *eight*, *nine* or *ten* over the *seven*. This would certainly give one a good grounding in the ability to feel *seven*, make phrases over the bar lines, and even superimpose another metre on top. But this does not refer to the signature material that goes with this *tal*. To play in a semi-traditional context at least, in the traditions that I know of, including Indian music, African, Caribbean or Brazilian music, one must know typical repertoire—patterns—that go with the piece in question. In the present case, this would be the *theka*.

Tabla repertoire such as the *theka* ostinato reference pattern, however, is played with the two hands combined. To combine the previous exercises with the *theka*, one could perhaps play the downbeats, upbeats, dotted notes and so on with the feet, while maintaining the *theka* in the hands. This would be difficult but would certainly help to impart a multi-dimensional perspective to one's *theka* playing. Or, one could recite the *theka* or variations while playing the downs, ups, and threes, with the hands, or vice versa. Or, closer to the original interpretation, I would turn to the previous *Odd in You seven* routine and then play the *theka* over the same foot ostinato, then alternate the *theka* with the crossing (dotted note) and harmonic variations. Indian music is presented linearly, after all, and this would prepare the student to make linear patterns that cross the metric structure and then return to the *theka*, as in a traditional solo.

It makes sense to revisit Toro's perspective at this point, however. He admitted, in effect, that he is not trying to play Indian music; that they have typical phrases and compositions that must be absorbed. His method is rather intended to give a universal structural perspective from which to work, and the flexibility to move around within that structure. The Indian approach adorns that structure with various ornamental features, giving, through experience, a flair for different styles of ornamentation. It also works with regrouping structures, especially the *tihai*⁸⁸, and, with experience, the player gains familiarity with these structures and learns to improvise them, in addition to playing memorized ones, *and* creating new ones by mathematical manipulation. As we saw in the section on

⁸⁸ A rhythmic phrase repeated three times, without or without rests in between, that concludes with its final stroke on an important beat in the cycle, usually the *sam*. (Leake 1986, 13)

Indian rhythm, exercises and games that work extensively with the regrouping principal are also included in Indian music training. Pillay has given me a few of these problems to work with as well. Here is a short excerpt of one example:

Working in *Adi Thalam*, which has eight beats (*matras*), divided in fours (*Chatusra Jati*), here is a phrase of five (*kita ki na dhin*), to be repeated three times; with a gap of one between the phrases, what will be the setup?

The answer:

$8 \times 4 = 32$ subdivisions (Pillay called them 'beats', I believe. This terminology is not fixed.). The phrases are 5 + 1, 5 + 1, and 5, or 17. The setup will therefore be 15. A complete answer, in the style, could be:

na num na num na dhin dhin num (the usual *Theka*-like phrase, called *Prastara 1*, 8 subdivisions)

na num na num na dhin dhin (a truncated version, 7 subdivisions)

kita ki na dhin - (6)

kita ki na dhin - (6)

kita ki na dhin (5)

na... (beat 1)

The actual exercise goes through the same process with phrases of six and seven subdivisions as well. These are all then played as a section of an *Adi Thalam* solo. The important point is that these are idiomatic phrases to be derived, memorized, created, and manipulated. Once formalized however, reciting and playing them presented very little challenge. I believe this is due to extensive previous experience with regrouping practice; this took place informally and intuitively, in playing and listening to African Diaspora music. Regrouping practice became a very specific, intended goal however, in Toro's method.

I will mention one more example from my work with Pillay. The *korway* that was analysed in the section on Indian rhythm, "Aural Tradition: Exercises in Context" (page 55), though it was quite intricate in its various and changing relationships to the beat structure, was later modified further as part of our lessons and as part of my evolving *Adi Thalam* solo. In its original guise, this section's lengthening phrases and the *tihai/thiramanum* ending changed relationships with the *tala* cycle several times, as the phrases, for the most part, did not agree in length with the *tala* (or half or quarter

tala). Toro's training in familiarity with the feeling of downbeat and upbeat was helpful here, as the phrases switched perceived orientation from one to the other.

In the new modification, however, the same *korway* is repeated, in its entirety, but the subdivision changes; first it gets slower, at three subdivisions to the beat, or *matra*, then faster, at six (the original had four). To clarify, the *bols* are still played in the same relationships to each other and to the underlying subdivision, but in a different relationship to the beats of the cycle. First, at three quarter speed and then, one and a half. These speeds are called, in Pillay's Carnatic terms, *Chatus-sra Nadai*, *Madya laya* (subdivision of four, medium speed), *Thisra Nadai*, *Madya laya* (subdivision of three, medium speed), and *Thisra Nadai*, *Drutya laya* (subdivision of three, fast speed). (Pillay 2011; Pillay 1997, 8–9) The speeds reference the relationship to the *tala* beat.

For practice, he had me play the slower version of the *korway* until it resolved to the *sam*. It takes three repetitions of the *korway* cycle, or sixteen *tala* cycles, to do this. Pillay's prescription for my solo, however, is to play one *korway* cycle at each speed. The normal speed, original version takes four *tala* cycles and returns to the *sam* after one iteration. The slower version takes five *tala* cycles, two and two thirds beats, and the faster, two cycles, five and one third beats. Thus, the whole exercise takes twelve cycles:

$$4 + 5 + 2 = 11 \text{ tala cycles;}$$

$$2 \frac{2}{3} + 5 \frac{1}{3} = 8 \text{ beats, or 1 tala cycle;}$$

$$11 + 1 = 12.$$

Here are the three *korway* variations:

Korway in chaturasra nadai, 1x, thisra nadai, madya laya (single speed) 1x, thisra nadai, drutya laya (double speed) 1x

25

H.C.

Tabla

num dhin ki ta tha ke Tham num dhin ki ta tha ke Tham tha num dhin ki ta

26

H.C.

Tabla

tha ke Tham tha num dhin ki ta tha ke Tham tha tha num dhin ki ta tha ke

27

H.C.

Tabla

Tham tha tha num dhin ki ta tha ke Tham Tham tha thee na tha cha tha ki ta tha ke

28

H.C.

Tabla

Tham Tham tha thee na tha cha tha ki ta tha ke Tham Tham tha thee na tha cha tha ki ta tha ke

29 Thisra nadai, matyama kala...

H.C.

Tabla

num dhin ki ta tha ke tham num dhin ki ta tha ke tham

H.C.

30
 Tabla
 tha num dhin ki ta tha ke tham tha num dhin ki ta tha ke

31
 H.C.
 Tabla
 tham tha tha num dhin ki ta tha ke tham tha tha

32
 H.C.
 Tabla
 num dhin ki ta tha ke tham tham tha thee na tha cha tha ki ta tha ke

33
 H.C.
 Tabla
 tham tham tha thee na tha cha tha ki ta tha ke tham tham tha thee

34
 H.C.
 Tabla
 thisra nadai, double speed, 1x...
 na tha cha tha ki ta tha ke num dhin ki ta tha ke tham num dhin ki ta tha ke tham tha num dhin ki ta

35
 H.C.
 Tabla
 tha ke tham tha num dhin ki ta tha ke tham tha tha num dhin ki ta tha ke tham tha tha num dhin ki ta tha ke

36
 H.C.
 Tabla
 tham tham tha thee na tha cha tha ki ta tha ke tham tham tha thee na tha cha tha ki ta tha ke tham tham tha thee na tha cha tha ki ta tha ke

H.C.

Figure 126. *Adi Thalam Korway* in Three Speeds.



Audio Example 62. *Adi Thalam Korway* in Three Speeds (CD Track 62).

This tidy formulaic construction is another small piece of evidence suggesting that, if pursued to guru status at least, the Indian rhythmic system is more than just learning and reciting compositions; it is inventive, analytical and insightful regarding rhythmic relationships. It occurs to me that perhaps the emphasis on rote memorization is a feature of child learning; in several of Pillay's group lessons that I have attended, he has attempted to give much simpler theoretical lessons to the young *tabla* learners (approximately six to fourteen years), some of whom have played longer than I and who have good technique and sound on the instrument. These lessons were met by the students with mostly confusion and blank stares. Zakir Hussain describes in interviews some of his own learning experiences with his father and guru, Alla Rakha, himself a renowned performer with the world famous sitarist Ravi Shankar, among others. Hussain says that Alla Rakha used to give him complex rhythmic problems as a child, and that he would astound friends and acquaintances with the answers. (*Zakir Hussain | The Speaking Hand I - English Subs 2011*) Hussain, of course, was a child prodigy who has since gone on to become the preeminent *tabla* player in the world, under the tutelage of a world-famous master/father. I would imagine that if there is a degree of truth in Toro's idea that the Indian system of learning only entails compositions and rote learning for years and years, it is because young minds tend to grow into mathematical manipulation, and Indian musicians, as Toro admitted, tend to start young. Young children excel in mimicry over analysis, and the system is designed to accommodate that.

Still, the purpose of describing the *korway* manipulation exercise was to demonstrate how helpful my engagement with Toro's perspective was in deciphering it. My first attempts to establish some sort of firm ground from which to grasp the reorganization of the material were fraught with confusion. This seemed more difficult to me than most regrouping exercises, because the material that was being redressed in its relationship to the beat was not one repeating group of subdivisions, but a set of motives of varying lengths. These were phrases that already existed and owed much of their identity in my mind to their relationship to the beat in the original configuration. It seems to me that herein lies one of the most difficult and empowering aspects of the linear regrouping concept: Musical statements, or melodic fragments, I would argue, are composed of sequences of different sounds, or pitches, and their relationship to the underlying beat structure. When, however, we repeat the same sequence in another relationship to the underlying structure that musical statement is both

its old self and something new. Being able to hear it as both is yet another way in which multi-dimensionality figures into a learned rhythmic concept. Hearing that statement in relation to two different, simultaneous beat structures would be a harmonic equivalent.

Presented with Pillay's challenge, I worked on playing and hearing the *korway* whenever I could. Sometimes this meant while driving in the car or walking—this is one of the great advantages of the Indian system, in which compositional material is memorized and transmitted orally. I would piece together bits of it—the *bols* and the beat—and gradually try to move a bit further into the composition. I knew that an intentional motion with its own inertia should help, so I tried to generate that before each inevitable derailment. Then, when I could sustain the motion and the *bols* for more than a few beats, I realized something was familiar. It felt like something I had done before but not quite. I could not put my finger on it at first. While driving to a show one day, I realized this is the dotted note. “But wait, how does that work, it is the dotted note but somehow backwards,” I thought. Finally, I realized that the fixed beat now felt like a dotted note in relation to the composition. Because I was used to feeling the dotted note against other thematic material, though mostly static *ostinatos*, the relationship was familiar. Now, the phrases that I was used to seemed to hold their original identity, but the beat felt like a dotted note, and it felt, more or less, comfortable. The trick was to get into that orientation, as it was the composition that slowed down, not the beat that sped up. I do not know if Pillay or other Indian musicians experience this relationship in this way, or if the average person who can perform this can put the experience into words. I have used a lot of words here to describe my engagement with this rhythmic manipulation. I find it highly significant that my previous experience with Toro's method gave me a feeling that I could grab onto, even if it was in some sense inverted from my usual feeling of that relationship. As Toro says, *three* is just a dotted note from *two* and *two* is a triplet from three. It is as if standing on either side of that line and observing the other.

Summary

In summary, I don't think that the harmonic perspective of rhythm prepares one fully to experience rhythm as an Indian trained percussionist does. Toro admitted as much. Even in terms of complex regrouping exercises, I think the Indian system presents problems that would require effort over and above what Toro's training would prepare for. And, as mentioned, Toro's perspective is not concerned with repertoire. He thinks learning 'patterns' is largely a waste of time, and he may be right, but he also admitted, when pressed, that his rarefied position in the world of music and rhythm is a lonely one. For myself I still foresee playing traditional, established musical forms with people who take their perspective mostly from those forms. For that, one needs to know, respect and enjoy the

repertoire. I still have a long way to go in either method—Toro's or Indian Classical—but I am now better able to appreciate the strengths and limitations of both. What the harmonic perspective of rhythm does impart is already in the name—perspective. As a shortcut or a launching pad, I have found that perspective very informative, and it continues to generate new insights for me with most every practice session. Of equal significance is that the perspective seems to apply to any music—or, in Toro's terms, even to 'rhythm,' which is 'not music'—whether the rhythmic locus of complexity is primarily harmonic, linear, or both.

Conclusions

I can now attempt to answer more directly the questions posed at the beginning of this study, based as always on my experiences with the material in question—Toro, African Diaspora, Indian—and my observations of those experiences. First (1), it was proposed that the work would evaluate the extent to which the acquisition and application of polymetric inter-dependence can add significantly to overall musicianship, with special reference to percussionists learning foreign, rhythmically complex music outside of their own musical traditions, at both the macro/syntactical and the micro/groove levels of reference.

As a strict prescription for the fastest acquisition of music from one particular tradition, I do not believe the harmonic perspective of rhythm is the most efficacious approach to mastery. The reasons are several: a) Even those musics that were the primary focus of this study—of various African Diaspora and Indian classical traditions—though profoundly multi-dimensional in rhythmic concept, do not usually require one person to perform polymetrically. I can think of a few minor exceptions, but as the term implies, they are vastly outnumbered in normal practice; b) The more usual approach is rather the sequential (linear) application of different rhythmic or metric references, as in the case of an Indian accompanist/soloist, or the African inspired soloist; or, alternatively, the harmonic application of said references in the African style accompanist or soloist role, played *simultaneously* with (against) contrasting rhythms and/or metres. In neither case do we find one person simultaneously playing different metres; therefore, the time spent learning to do so is presumably better spent learning and perfecting the original source material, in original orientation; that is, sequentially, or simultaneously with others; c) Though the harmonic approach to feel as discussed in the section, “Feel” (page 136), can be informative as a conceptual bridge or even a shortcut to authentic performance capacity, much listening and *in situ* experience is still required. The cultural milieu is still indispensable.

However, none of these points are meant to be taken as coffin nails to the approach. As mentioned several times throughout this study, the actual target audience, to borrow jargon from the marketing world, is not the steadfast uni-cultural specialist. I do believe even a broad-minded uni-culturalist can benefit tremendously from the methods of the harmonic approach to rhythm, and especially from the perspective intended. I refer to someone who is not content only to copy and re-present, but who wants to know about how their music works, and how it is situated in the more general arena of music, across cultures, or perhaps even in Toro's still broader concept of just 'rhythm'. Furthermore, it follows from this mindset that the aforementioned, hypothetical individual might even-

tually find themselves interested in knowing about or even playing other kinds of music (like myself, Toro and a growing number of rhythmic specialists throughout the world), and eventually, searching for relationships, similarities, differences and perhaps even 'universal archetypes.' Now, the discussion is approaching one of the target audiences, and the potential utility of the perspective is growing. As Toro insisted, the polymetric exercises and their arguably extreme permutations are not really meant for performance at all, but for perspective. The method is rather meant to enable a musician to hear and understand how and to what extent the harmonic series is represented in any given music. He or she should therefore gain insight into how to quickly learn, fit in with, approximate or suggest *various* rhythmic styles, stylistically/compositionally, as well as in terms of feel.

Finally, the other (or, likely, overlapping) audience consists of those people who *are* interested in cultivating a multi-dimensional sound, even while playing alone. In this instance, both the polymetric exercises and the polyrhythmic motion and repertoire based exercises exploiting the down, up and dotted note approach can be very useful—as useful as any approach I have seen, and broader in scope and application. The greatest challenge is perhaps, focus; to master a given subset of exercises, but especially to persevere until the new material can be consciously and fluently incorporated in performance, in whatever chosen style(s), at the required tempi.

The next question (2) asked whether it is possible for one person to experience more than one metric reference at the same time, thus challenging and interrogating the view of music psychology expert Justin London who states, “There is no such thing as polymetre.” (London 2004, 50) My ideas on this argument were stated at the end of section, “Polymetre,” which begins on page 84. In summary, I believe that it may indeed be true that when attending to polymetric stimuli, our minds jump back and forth between the two (or more) metres, and/or hear them as one, composite melody; I do not have neurological evidence to the effect that the mind can process two metres in parallel. In a related discussion of consciousness in general, Damasio argues against the notion of a 'Cartesian theater' (a term dubbed by Daniel Dennet) of mind, metaphorically uniting, “glorious technicolor projection, stereophonic sound, and perhaps a track for smell too,” suggesting rather:

It is perhaps more fruitful to think that our strong sense of mind integration is created from the concerted action of large-scale systems by synchronizing sets of neural activity in separate brain regions, in effect a trick of timing. (Damasio 2008, 94–95)

Damasio is discussing the actual location(s) of brain activity and stressing the fact that—contrary to popular intuition—there is no one location but rather a distributed network of networks, and that

what we perceive to be simultaneous sensations are rather experienced sequentially, in close temporal proximity. We probably hold one thing (sensation, image) in conscious attention at a time, but through this, 'trick of timing,' experience (and mind) feels to us integrated, simultaneous. It may be a stretch to apply this argument to the conscious impossibility of two metric references existing simultaneously in one mind, but it suggests as much. Summers and Kennedy state more directly that in their experiments, which trained subjects to produce a *five:three* polyrhythm, the results, "suggest that the use of independent timing mechanisms for the two hands may not be possible in the performance of bimanual activities." (Summers and Kennedy 1992)

Still (again in summary of the section, "Polymetre"), the fact remains that human beings, or a subset of them at least, do enjoy and produce sounds of an intentional, polymetric nature; we aspire to and are inspired by polymetre. What is more, as I have experienced personally and in observance of other rhythmic specialists the likes of Toro, we as individuals are indeed able to produce polymetre...with practice to a fairly astonishing level of complexity. The concept of motion as discussed throughout this paper suggests that much of this capacity is rooted in the body, but, for me at least, that is not a basis to say polymetre does not exist. Body and mind are integrated, though a great number of autonomic as well as learned, automatic processes happen without our conscious attention. Polymetre existing in the mind as parallel, exactly simultaneous, conscious images is perhaps impossible, but that for me is a fair amount of qualification. Moreover, I would posit that it is perhaps the cognitive impossibility of maintaining perfectly parallel aural images that makes music of a polymetric character so alluring for some; others might find only distraction, or worse⁸⁹.

Next (3), we are concerned with whether and in what ways the idea known herein as, 'The Harmonic Perspective of Rhythm,' presents or does not present an ecologically inspired model that has broad and even transformational applications in the way we conceive of music both conceptually and pedagogically. Perhaps, instead of 'ecologically,' with connotations that the theory relates human musical practices to birdsong or wind through the trees, I could have said, 'physically,' as in the physical properties of energy and matter that animate our universe. In the broadest sense, however, the former is a manifestation of the latter, and either may be grounds for consideration. We, as part of the ecology, do indeed seem moved by the rhythms of nature, whether or not we choose to 'tune in' to the phenomenon. As to whether our music is inspired by the movements in the wider ecology, it seems so in many cases, but none that I would hold up to argument. That the waves of the sea move in

⁸⁹ An American friend of mine who lived in Côte d'Ivoire at the same time I did confided that African music made him feel nauseous because there were too many things happening at once.

rhythm, strikingly similar to the wave-like movement generated by good, 'natural,' and 'effortless' instrumental technique, that birds seem to sing to each other in exquisite, complex rhythms, that the sub-structure of a partially eroded papaya tree in my garden (among countless examples of natural symmetry, many of them based on simple ratios such as *two:three*) exhibits a beautiful, intricate geometric pattern, all these are inspiring but anecdotal. It does seem certain, somehow, that the pre-eminence of frequency in the natural world, from the sub-atomic to the galactic scale, sound, light, electromagnetic radiation and so on, is fundamental to our own function, and that therefore, it is 'natural' that these same ratios—'fundamental' and less so—should manifest in our music making. Some people, including Toro, suggest that there is an essential connection between pulse, at a given speed, its octave equivalents in the range of frequencies that manifest as pitches audible to humans, and even those octave equivalents in the range of frequencies that gives us the visible spectrum of light, with its various colours (though sound propagates through air as a mechanical wave and light, which is electromagnetic radiation, requires no medium). As intriguing as these ideas are (and there are many more, relating the rotational frequency of the earth to certain a certain pitch, colour and certain of our own bodily processes, for example), I have neither the means nor the wherewithal to go beyond anecdote; I only mention such ideas for general consideration of the potentially much wider scope of Toro's vision.

Of these potential equivalences, difficult to prove though they are, the most informative in the present study is that between the harmonic perspective of rhythm and the more commonly connoted harmonic perspective of pitch. As noted in “The Harmonic Perspective of Rhythm” (page 15), and in, “The Harmonic Series: Pitch or Rhythm” (page 90), I prefer to consider this relationship an informative analogy, in that rhythm and pitch function in many similar ways. Significant among these are: (a) the idea that the various potential frequencies that make up a rhythmic scheme or a rich tone all relate primarily to the fundamental as source and reference; and (b) that octaves, or doublings of frequency, do not contribute as much to the overall richness of a potential combination; that is, they do not impart a *harmonic* character to a combination of pitches, or of rhythms. It follows in theory and in practice that the simplest, non-octave combination is the fifth, or the metric combination of *two* and *three*, and these phenomena share the same generative ratio. The harmonic series as it relates to pitch is, of course, very much a physical property of certain kinds of matter in certain shapes and orientations (a string or membrane must be stretched, for example). The harmonic theory of rhythm then is certainly a physically, or naturally inspired model.

As for the second part of the question, I have found that the model does indeed have transformational applications for the conception and pedagogy of rhythm, but with a few caveats. First, as mentioned

previously, this model of rhythm is especially useful for the musician wishing to reach beyond the boundaries of his or her particular style, or perhaps to work in and/or combine several. This archetypal rhythmic model, conceived of as the harmonic series, offers a new way to see rhythm, and to understand those types of music that appear to be rhythmically 'free,' 'loose,' 'flexible,' 'complex,' and so forth; a style might well appear this way because it manifests more, and/or unusual rhythmic cycles, as the timbres of different instruments differentiate themselves by manifesting more or less of the various harmonics that are generated by the fundamental frequency sounded. That is, a violin and a trumpet can play many of the same pitches, but it is always clear which instrument is which. Similarly, the rhythmic aspects—or, the variety of frequencies that manifest—of a polka and an Afro-Cuban Rumba easily differentiate the styles, even played at the same speed. This analogy is limited. In rhythm, unlike in pitch, we can choose to play certain parts of a given metric cycle, not just combine them whole. Again, the model is archetypal, not stylistic, and it is informative from that perspective. It is a grid, not a drawing or a map.

The second caveat is the barrier to entry. Most people do not choose music or rhythm because of their theoretical interest; they are inspired by music, of whatever style, first and foremost. Therefore, it is perhaps best to present the model after a strong grounding in (inspiring) music, of whatever cultural background. This is the way Toro himself progressed, it is how I got to the perspective I have done my best to present in this study. Toro seems to suggest, in hindsight, that there is a better, quicker way. The essential question, I think, is, “To what?” The harmonic perspective of rhythm lends itself most obviously to the theoretically minded, cross-genre specialist, but its potential to bestow rhythmic capacity—to anyone—is perhaps just as strong a justification for inclusion in a new, pedagogical paradigm. Perhaps the harmonic perspective of rhythm would make its strongest impact only in a new paradigm that embraces these two goals: The development of a new generation of musicians with a fully grounded but flexible, multi-dimensional rhythmic concept, and, the cultivation of a new theoretical stance that accommodates well those musics of the world that value rhythmic multi-dimensionality and expression as primary aesthetic loci. As for the more practical question of how to include the perspective in a workable pedagogical approach, perhaps exercises leading to interdependent motion and metric capacity of the sort prescribed by Toro and in this thesis could be included gradually in a transformed curriculum. These sorts of exercises could be taught as scales, arpeggios and the like are often taught now; though their worth would not be immediately apparent or useful to all, the eventual kinaesthetic and theoretical benefits to those who choose to open themselves to music would become obvious; the tools will have been wrought and ready when needed.

As for the consideration of 'broader philosophical questions,' they are repeated and considered below:

1. *In what ways does the dichotomy between constructed knowledge and actual practice distance us from that practice and from a holistic experience of that being investigated, or from reality itself?*

It has been my experience, as discussed in “Constructed Knowledge and the Experiential Perspective” (page 5), “A Scientist's View” (page 35), and elsewhere, that there exists an un-mendable gap between our experience of reality and our attempt to present, describe, and analyse that experience⁹⁰. Included therein is the bodily experience of performing some action, such as touching an instrument, or playing music. It follows thus that to know how to do something, as opposed to knowing some fact or other concept, requires an experience of the act itself. However, most people do not progress very far in music without some guidance, and those that do will still be cut off from the advantages enjoyed by the literate and theoretically knowledgeable musician. Though Toro himself proclaimed there is, “no conflict between the intellect and the natural world,” (Toro 2012m) I maintain that this is rather the ideal to which we should aspire, where observation, intellectual processing and execution can proceed seamlessly, seemingly without interference. Indeed this ideal calls to mind the Flow state experienced by creatives and described by Csikszentmihalyi in his popular book by the same name⁹¹. (Csikszentmihalyi 2009)

However, one danger of being less than completely integrated in this sense was mentioned above: A musician (in the context of this study) who does not or cannot access literature and theory is at a great disadvantage, with little hope of being a relatively 'whole' artist. On the other side of the fence, as discussed in, “Multi-dimensionality 1” (page 78) and, “Ways of Knowing” (page 79), being overly grounded in theoretical notions of what is and how things work can distance us from our direct experience—experience that may in fact contradict our theory. This, according to Toro, is how the Western perspective has failed to appreciate the full spectrum of rhythm as practiced by AT/Music specialists. An extreme theoretical bias might also close our cognition to the broader awareness I find helpful if not essential for the perception of multi-dimensional rhythmic phenomena.

2. *Do theoretically informed practitioners (in this case musicians and composers) in some cases assume a one to one correspondence between theory and practice, and in so doing, are they*

⁹⁰ Žižek and other philosophers, as well as cognitive scientists and neuro-scientists such as Dennet and Damasio might also choose to discuss the gap between reality *itself* and our experience of it, before any attempt at description.

⁹¹ For another interesting discussion of this subject, see Bill Harris' new e-book, *The New Science of Super Awareness*. (Harris 2015, 99–112)

substituting the model for the subject? Does the tendency to objectify and explain impoverish the full experience of the creative process?

This is a broad question for general consideration; I will not give a yes or no answer, but rather an opinion based on the arguments offered in this study. I believe that in some cases, some musicians and pedagogues—or perhaps all of us—are capable of falling into this dilemma. Theory is so very helpful and so much a part of how we understand, learn and create. It is worth considering whether the system to which one subscribes (for there is no one system of musical knowledge, even in a single genre of music) is guilty of this transgression, always, sometimes, or on occasion. The comments of Malian *balafonist*, Neba Solo, in a lecture and discussion with Harvard Professor Ingrid Monson, show an AT/Musician's perspective on this very issue, in regard to his art form:

Je n'écris pas le balafon...Si on arrive à écrire le balafon, je me suis dit, est-ce que ça va rester comme je le connais déjà? Est-ce que ça va pas transformer le balafon à autre chose?

(I don't write the balafon...If one manages to write the balafon, I ask myself, is it going to stay as I already know it? Is this not going to transform the balafon into something else?)
(Kenedougou Visions: Music of Neba Solo by Ingrid Monson || Radcliffe Institute 2013)

Solo's perspective alludes to more than simple ignorance of music notation. He astutely observes that the written version would most likely not resemble or function as the aural version. For him this indicates not to bother with trying to write his music. For others, it can serve as a point of reflection and perhaps, caution.

3. *In what ways can we attempt to act in cognizance with the great body of theory left to us in any one discipline and at the same time cultivate a thorough experiential perspective, deriving maximum benefit from each?*

As individuals, we should strive to learn and understand, but also to work with the mysteries we cannot completely unravel. I believe that learning by ear is an essential skill in this regard, as it reinforces our natural talent for precise listening and sound production, regardless of the theoretical implications of the material. Theory is perhaps a guide, a map, a resource, but the actual journey is accomplished with the body and the senses. This is surely not news to the successful musician or pedagogue, as this lesson of integration is, as I see it, essential. Perhaps what is sometimes missing is the direct or subtle transmission of this perspective to the student—the cultivation of experiential *and* theoretical knowledge, and their integration—with the aim of increasing the number of those who seem to just 'get it.'

Furthermore, in the cultivation of an *a priori* multidimensional perspective, I find that the method and theoretical stance discussed throughout this work fosters and necessitates the cultivation of a

broad awareness, from which several bodily and aural perception and performance capacities are maintained simultaneously. For me, this awareness deepens all aspects of musical endeavour, from technique to creativity. Significantly, it can also act as a bridge between implicit and explicit knowledge; these two ways of knowing, held simultaneously in awareness (or perhaps, nearly so), approach Toro's observation that he sees no conflict between intellect and 'natural' ability. And, as he adds, "...intellect adds to the natural ability. Intellect it just doubles...it just doubles your understanding of what is natural, and it adds, it embellishes, it enhances the natural." (Toro 2012m) A parallel can be drawn to holistic movements in nutrition, ecological building, or agriculture, among others, that look to previous wisdom as to how to manage our farms or nutritional profiles as multi-dimensional, interdependent systems, composed of an array of healthy components that work symbiotically to contribute to the health of the overall system. The difference in modern applications is that now we have scientific verification and explanations to add to the anecdotal, experiential evidence of the past, in its many cultural guises. Similarly, with the harmonic perspective of rhythm, we are offered an explanation and a method for replication/experiential observation of the various, moving rhythmically multi-dimensional musics of the world, but from a relatively neutral standpoint. It is a holistic model for rhythmic comprehension. It is perhaps Toro's attempt to address a postmodern dilemma: How can we access the efficiency, flexibility, independence, and autonomy of the modern approach to music and rhythm, while still referencing the depth and dimensionality of the pre-modern, community driven aesthetic? As I see things now, I will continue to study and to grow in the method and perspective, alongside whatever established musical forms I choose to study in future, for many years to come.

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