2018-04-05

Collective Time- Exploring Interaction in Music That Swings

Nicholas Petumenos

University of Miami, nick.petumenos@gmail.com

Follow this and additional works at: https://scholarlyrepository.miami.edu/oa_dissertations

Recommended Citation


This Open access is brought to you for free and open access by the Electronic Theses and Dissertations at Scholarly Repository. It has been accepted for inclusion in Open Access Dissertations by an authorized administrator of Scholarly Repository. For more information, please contact repository.library@miami.edu.
UNIVERSITY OF MIAMI

COLLECTIVE TIME – EXPLORING INTERACTION IN MUSIC THAT SWINGS

By
Nicholas Anthony Petumenos

A DOCTORAL ESSAY

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Doctor of Musical Arts

Coral Gables, Florida

May 2018
UNIVERSITY OF MIAMI

A doctoral essay submitted in partial fulfillment of the requirements for the degree of Doctor of Musical Arts

COLLECTIVE TIME – EXPLORING INTERACTION IN MUSIC THAT SWINGS

Nicholas Anthony Petumenos

Approved:

_________________ ___________________
John Daversa, D.M.A. John Hart, B.M.
Associate Professor of Music Lecturer of Jazz Performance

_________________ ___________________
Gary Keller, M.M. Stephen P. Rucker, M.M.
Professor of Practice Lecturer of Jazz Performance

_________________ ___________________
Rafael Padron, M.M. Guillermo Prado, Ph.D.
Assistant Professor of Practice Dean of the Graduate School
A study was conducted on how musicians react to deviations from an isochronous pulse for the purpose of applying emerging understandings of the perception of time to the endeavor of cultivating musical timing in the context of jazz ensemble playing. Anecdotal wisdom was gathered through interviews with reputed sources. Classic jazz recordings were examined as part of the inquiry into how to best improve the interactive aspect of one’s musical timing. Strengths and deficiencies of existing paradigms of practicing and teaching were evaluated with consideration to leading-edge insight into temporal cognition. It was concluded that there exists a need for a pedagogy for the practice and teaching of swing timing that takes into account the complexities that result from the interactions between the players in a jazz ensemble. A recommendation for further study is enclosed.
DEDICATION

This doctoral essay is dedicated to Marina and Simon Petumenos for accompanying me on this journey, and to Sandra Ricardo, Erich Solomon and Timothy Petumenos for their unfaltering support of all my endeavors.
ACKNOWLEDGEMENTS

I would like to thank my early mentors in Alaska, Karen Strid and John Damberg, for putting me on the path. I also extend my gratitude to Lee Thompson, Brandon Cockburn and Cameron Cartland who taught me so much about time from behind the drum set on the bandstand. Joseph Rogers, John Wilkins and Jon Damian of Berklee College of Music deserve thanks as well. Pianist Tom Bargelski and guitarist Seth Freeman certainly merit acknowledgement as my most significant extracurricular teachers.

The whole village of mentors at the Frost School of Music contributed to this process and I am much obliged to all of them. Those mentors are John Daversa, Gary Keller, Gary Lindsay, Martin Bejerano, Daniel Strange, Kate Reid, Don Coffman, Steve Rucker, John Yarling, Juraj Koj, Deborah Schwartz-Kates, Rafael Padron, Brian Powell, Nancy Zavac, Teresa Lesiuk, Shelly Berg and Shannon de l’Etoile. Above all, I am grateful to John Hart for guiding my process in graduate studies and for constantly emphasizing the importance of time. This essay is an elaboration of our many profound discussions of time over the last five years.
# TABLE OF CONTENTS

## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>v</td>
</tr>
</tbody>
</table>

## Chapter

### 1 INTRODUCTION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justification</td>
<td>3</td>
</tr>
<tr>
<td>Objectives</td>
<td>5</td>
</tr>
</tbody>
</table>

### 2 REVIEW OF LITERATURE

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory Remarks</td>
<td>7</td>
</tr>
<tr>
<td>Body</td>
<td>8</td>
</tr>
<tr>
<td>Summary</td>
<td>16</td>
</tr>
</tbody>
</table>

### 3 METHODOLOGY

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Gathering</td>
<td>18</td>
</tr>
<tr>
<td>Interviews and Classic Recordings</td>
<td>18</td>
</tr>
<tr>
<td>Metronome Study</td>
<td>19</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>25</td>
</tr>
</tbody>
</table>

### 4 THE INTERVIEWS

<table>
<thead>
<tr>
<th>Interview</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dave Liebman</td>
<td>28</td>
</tr>
<tr>
<td>Steve Johns</td>
<td>31</td>
</tr>
<tr>
<td>John Hart</td>
<td>33</td>
</tr>
<tr>
<td>Commonalities and Differences</td>
<td>34</td>
</tr>
<tr>
<td>Suggested Recordings</td>
<td>38</td>
</tr>
<tr>
<td>Frank Sinatra Live at the Sands Hotel 1966, “Fly Me to the Moon”</td>
<td>39</td>
</tr>
<tr>
<td>Miles Davis, “No Blues”</td>
<td>41</td>
</tr>
<tr>
<td>Miles Davis, “Four”</td>
<td>42</td>
</tr>
<tr>
<td>John Coltrane, “Tunji”</td>
<td>43</td>
</tr>
<tr>
<td>Art Blakey and the Jazz Messengers, “One by One”</td>
<td>44</td>
</tr>
<tr>
<td>Chick Corea “The One Step”</td>
<td>45</td>
</tr>
<tr>
<td>Miles Davis, “Freddie the Freeloader”</td>
<td>46</td>
</tr>
</tbody>
</table>

### 5 THE RECORDING SESSION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isochronous Metronome</td>
<td>51</td>
</tr>
<tr>
<td>Fluctuating Metronome</td>
<td>54</td>
</tr>
<tr>
<td>No Metronome</td>
<td>63</td>
</tr>
<tr>
<td>Comparison</td>
<td>66</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>DRAWING CONNECTIONS</td>
<td>70</td>
</tr>
<tr>
<td>Period Versus Phase</td>
<td>72</td>
</tr>
<tr>
<td>Thresholds- Conscious and Unconscious Responses</td>
<td>76</td>
</tr>
<tr>
<td>Elasticity and Larson’s Physical Forces</td>
<td>82</td>
</tr>
<tr>
<td>Mentality, Attitude and Cooperation</td>
<td>87</td>
</tr>
<tr>
<td>The Sonic Environment and Other Factors</td>
<td>89</td>
</tr>
<tr>
<td>SUMMARY</td>
<td>91</td>
</tr>
<tr>
<td>Conclusions</td>
<td>91</td>
</tr>
<tr>
<td>Implications for Teachers</td>
<td>92</td>
</tr>
<tr>
<td>Suggestions for Further Research</td>
<td>97</td>
</tr>
<tr>
<td>Final Thoughts</td>
<td>99</td>
</tr>
<tr>
<td>APPENDIX - INTERVIEWS</td>
<td>101</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>107</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

## Chapter

3  Table 3.1 Click Track Programming with PPQ in Logic Pro X ..................... 24

5  Table 5.1 Snare and Guitar, Bars 76-77, 132 Isochronous ................................ 52
    Table 5.2 Click and Bass, Bars 37-40, 216 Isochronous ................................. 53
    Table 5.3 Click and Bass, Bars 11-16, 132 Non-Isochronous ............................. 54
    Table 5.4 Click and Bass, Bars 18-23, 132 Non-Isochronous ............................. 55
    Table 5.5 Click and Bass, Bars 38-42, 132 Non-Isochronous ............................. 56
    Table 5.6 Click and Bass, Bars 44-50, 132 Non-Isochronous ............................. 57
    Table 5.7 Click and Ride, Bars 67-69, 132 Non-Isochronous ............................ 58
    Table 5.8 Click and Bass, Bars 15-18, 216 Non-Isochronous ............................ 60
    Table 5.9 High Hat and Bass, Bars 52-53, 216 Non-Isochronous ........................ 61
    Table 5.10 Click and Ride, Bars 61-67, 216 Non-Isochronous ............................ 62
    Table 5.11 Click, Snare and Bass, Bars 11-14, 132 No Metronome ...................... 63
    Table 5.12 Snare and High Hat, Bars 36-40, 216 No Metronome ........................ 64

6  Table 6.1 Click and Bass, Bars 44-50, 132 Non-Isochronous ............................. 80
Chapter 1
INTRODUCTION

Music unfolds in time. Our ability to perform music in ensembles therefore depends on our capacity to share a common experience of time. It is the purpose of this writing to delve into the relationships between individuals in the act of maintaining continuity of tempo and time feel in the context of jazz music that swings.¹ The potential for developing new practicing and teaching strategies that address the idiosyncrasies of collective musical timing will be explored. While techniques for strengthening one’s personal sense of pulse are abundant, methods of practice pertaining to the interdependent subjectivities within a group are less defined. There exists a need for a pedagogy for the practice and teaching of swing timing that takes into account the complexities that result from the interactions of the players in a jazz ensemble.

When practicing to a metronome or recording to a click, there is an absolute reference for the spacing of isochronous pulses.² Such activities are acknowledged to improve a player’s ability to sustain a consistent tempo. Such practicing does not, however, equip one for the myriad of professional circumstances in which aberrations

¹ The term “swing” is used often in the discussion of collective time in jazz music. There are inherent challenges to defining a style of music. Ethnological, cultural and historical contexts matter. It is difficult to draw delineations between genres. Separating an older style of playing from a newer style that represents an outgrowth of that older style can be problematic. For example, the “jazz” of the 1920’s and the “swing” of 1930’s and the “bebop” of the late 1940’s were distinct musical styles that are often consolidated under the label of “jazz music.” Since this essay is concerned with pedagogy and practice above musicology, a short functional description of swing will suffice. Swing, as used herein, refers to music in which a triplet subdivision underlies the quarter note.

² Isochronous is a term that describes a series of repetitive pulses, sounds or other events that occur at precisely equal intervals of time.
from a consistent pulse commonly occur. A player in an ensemble may be rushing or dragging, or persistently lengthening or shortening the last beat of the bar. Acoustical problems or other non-ideal sound reinforcement conditions can be disorienting and cause players to have a different perception of the center of the beat from one another. Timbral factors, for example, the envelope of an instrument’s attack, can also cause subjective discrepancies in the perception of beat placement. These are examples of situations that present a challenge to even the player who is quite diligent in their own personal metronome practice.

Seasoned performers, over the course of decades, will have developed ways of dealing with these scenarios. Such skills span a spectrum from conscious to unconscious. The stronger an individual’s internal sense of time, the better base line they have from which to judge whether fluctuations in tempo are occurring, and in what manner. Yet even with this awareness, there are various potential reactions. Adhering rigidly to the established tempo could be the proper response, whereas other scenarios could call for flexibility and gradual correction over a period of bars. Moreover, an attuned player will be sensitive to the manner in which the other players in the ensemble are interacting. For example, the pianist might take note of how the bassist chooses to correct if the drummer plays a fill that ends up a little too ahead of the beat.

It is this complex web of interconnected subjectivities relating to time that the author aims to probe through scholarly discourse. The empirical wisdom of reputable sources (musicians acknowledged for their high degree of skill), existing scientific research on the subject of temporal cognition, the results of the author’s own experiments and the analysis of classic jazz recordings will be synthesized in an effort to better
understand the collective experience of playing time in swing. Insights will be brought to
bear on the potential advancement of jazz pedagogy relating to ensemble coaching and
personal practice.

The discussions in this essay may be applied to other styles of music. The
principles set forth in this writing will be especially pertinent to styles that are built on a
steady rhythmic pulse and employ a high degree of rhythmic repetition with a relatively
short periodicity (usually based on structures of one to two bars in length). These styles
will herein after be referred to as “groove-oriented music.” Although a comprehensive
discussion of the West African diaspora is beyond the scope of this paper, it should be
pointed out that the vast majority of musical styles that have emerged in the Americas in
the last two centuries derive much of their rhythmic material from African traditions.  
Jazz, swing, blues, rock and roll, R&B, Cuban styles (son, guaguancó and cha-cha-cha),
Brazilian styles (samba and bossa nova), and Caribbean styles (reggae and calypso), have
all contributed to popular music across the globe in the twentieth and twenty-first
centuries. These styles have roots in West African music and can be described as groove-
oriented. In the interest of brevity and focus, however, an analysis of the subtleties of
timing in each of these musical traditions cannot herein be undertaken. The subject will
therefore be narrowed to swing.

Justification

Time and rhythm are of paramount importance in jazz music. Accordingly, it is
vital that a musician should strive to achieve their personal best in these crucial areas. In
like manner, educators have a responsibility to foster the pursuit of excellent musical

---

timing in their students. No concise format exists, however, for the study of the perplexing and enigmatic subject of timing in jazz music. There is a deceptive nature to the seeming simplicity of music based on short underlying rhythmic patterns (for example, the swing ride cymbal pattern), as the need for accurate reproduction of short musical phrases for extended periods of time places unique demands on the performer.

The challenges inherent in playing swing time are often amplified in ensemble contexts, especially in grade school and collegiate settings in which the level of experience of the players may be widely varied. The expert jazz educator should be prepared to impart practical advice to a student who may be struggling with inconsistencies in another student’s time. Knowing how to react to time problems in a way that is assertive, corrective and supportive, without being condemning, is important to the success of a group. Playing music together is, ultimately, a social activity. The ways in which one relates to other players, verbally and musically, is an aspect of one’s social skills and is as critical to one’s professional viability as any other facet of one’s musicianship. Accordingly, a music program that aims to prepare professional performers should imbue its students with this readiness.

Modern musicianship requires investment in these skills. It is becoming increasingly important for professional musicians to be comfortable with the rhythmic vernacular and the subtleties of time feel in a wide variety of genre. While the stylistically versatile performer holds an obvious professional advantage in that they will be prepared to accept a greater range of opportunities, it is the opinion of the author that practicing time awareness in groove-oriented music is also enriching in general. The practice of music with a high degree of repetition and subtlety in beat placement brings
about improvements in one’s timing that have the potential to positively impact the quality of one’s timing, phrasing and interpretation of common practice period music as well (and vice-versa). It is therefore unsurprising that the demand for education in jazz and other contemporary styles at the college level has seen an unprecedented increase in the last few decades, and that the demand has been met by many cutting-edge institutions.

**Objectives**

It is the author’s intention to contribute to the scholarly community of jazz and jazz education an interdisciplinary discourse on the subject of collective timing in swing. This essay will set forth principles that describe excellent swing timing. Having established an ideal, attention will be given to what obstacles exist to achieving that ideal in group settings. Rushing, dragging, truncation and expansion of beats within the bar and other common issues will be examined with the intention of understanding their root causes, as well as the tendencies musicians have in correcting for these aberrations. The effect of amplitudes, timbres and sonic environments on the perception of beat placement will be given consideration.

Once the timing complications that often plague ensembles have been identified and their causality analyzed, focus will be turned to the means by which these difficulties can be ameliorated. It is not the intention of this writing to forge the be-all and end-all of methods for the practice of musical timing and rhythm; rather the goal is to bring traditional and contemporary knowledge on the subject together to yield an elucidation as to the process by which these vital aspects of one’s musicality can be cultivated. This endeavor is multifaceted. Strengths and deficiencies of existing teaching and practicing strategies are examined, and potential areas of improvement identified. The value and
limitations of metronome practice are discussed with the intention of inspiring performers and educators to develop their own creative approaches to cultivating musical timing in group settings. The power of focused listening and jazz vocabulary building will be underscored. In conclusion, this writing will advocate for the creation of a comprehensive manual for the advancement of swing timing in jazz ensemble playing.
Chapter 2

REVIEW OF LITERATURE

Introductory Remarks

In reviewing the literature that addresses cultivating swing timing, it is essential to acknowledge that the bulk of wisdom on the subject resides in the experience of the living legends of jazz (and those who apprenticed with them). Recordings, although they do not represent “literature” in the conventional sense of the word, are arguably the best resource available to the serious student of jazz music regarding musical timing. The formal scientific study of timing in music, however, is a field that is vast and growing. Books and journals exist in abundance on the subject. Writings range from rigorously scientific to philosophical and subjective. Yet surprisingly, scant specific attention has been allotted to the subject of swing timing. Even less discussion exists pertaining to the intricacies of the interdependent timing of the individuals comprising an ensemble.

Accordingly, the author draws from a broad base of resources in the pursuit of the objectives of this paper. Observations from the author’s own experience as a performer and educator, knowledge from the author’s mentors, and insights gained through the conducting of interviews comprise the content gathered from human sources. Classic recordings are evaluated, heeding the subtleties of rhythm section playing and the relationships between players. It is in the context of this hominine approach to understanding swing that the author turns his attention to published sources, to bring their unique insights and focused inquiries to bear organically on the endeavors of the jazz performer, educator and student.
Body

In reviewing the pertinent literature, it is helpful to group works into three categories: philosophical, scientific and methodological. Such a division is necessarily somewhat arbitrary, in that it is difficult to write about something as mysterious and enigmatic as time without blurring the lines between philosophy, science and practice. In so far as organizing the research materials supporting this essay, however, it will suffice to be coarse in said delineations. In the category of writing deemed philosophical, there are two books that lent catalytic inspiration to the author in devising the topic of this writing and hence will be referenced and quoted extensively.

The first of those works is *The Time of Music*, by Jonathan Kramer. Kramer offers discourse on a staggering breadth of topics related to the nature of time and the human experience thereof. The ideas set forth in Kramer's book are more akin to contemplations than arguments, yet they are nonetheless rigorously supported by scientific research, musical analyses and the writings of other theorists. Considering the degree to which one’s musical timing is a product of the ways in which one perceives time, a thorough dialogue on the perception of time is apropos to the endeavor of understanding collective timing in ensemble playing. As Kramer’s discussion of time in music is focused primarily on common practice period music and experimental music of the early twentieth century, the validity of extending his line of thinking to jazz is evident.

---

The second book of import in the philosophical category is *Musical Forces* by Steve Larson.\(^5\) This book is dedicated to exploring the extent to which music is created as a reflection of the human experience of physical reality. Larson’s chapter on musical motion outlines various models of temporal experience that depend on the intention of the listener and/or performer, as well as upon where the listener and/or performer lies on the spectrum of activity versus passivity. Larson’s discourse is apposite to the arguments the author will make regarding intention and commitment in maintaining a steady tempo, and attitudes of assertiveness and flexibility in responding to tempo fluctuations.

Less central to the inspiration of this project than *The Time of Music* and *Musical Forces*, but nonetheless replete with valuable philosophical and sociological ideas relating to timing in music, is the book *Groove: An Aesthetic of Measured Time*.\(^6\) Author Mark Abel provides a fascinating overview of different types of temporal organization in music across broad geographies and many centuries as he attempts to hone in on what sets music that “grooves” apart.\(^7\) Abel also makes the assertion that human factors often keep grooving music from being perfectly isochronous, but that its intention and underpinning are inherently isochronous; a statement pertinent to the basic tenets of this essay on how to play swing music with other musicians.

More intriguing perspectives on what it means to “groove” can be found in David Burrows’ book *Time and the Warm Body*.\(^8\) Whereas Larson’s book concerns the

---


\(^7\) Ibid., 18-31.

relationship between music and the physical tendencies of the world, Burrows doesn’t stop at the physical. The potential of rhythmic repetition to catapult the human mind into other states of consciousness is explored within his dialogue on “grooving.” Burrows explores the purposes of playing music with an isochronous underpinning; purposes that can effect the way the music is played.

While the works of Kramer, Larson, Abel and Burrows are broad in scope, the writings the author has categorized as scientific are more narrowly focused. The resources in the scientific category are quite numerous. The database of the American Psychological Association boasts a stunning array of articles on the psychology of music, many of which pertain to the experience of time. Several such articles are included in the list of works referenced for this paper. Typically, articles that are worthy of scholarly publication in the field of music psychology are based on studies that are restricted to starkly simple musical activities. This results from the need to reduce variables in order to adhere to the scientific method.

In spite of the intrinsic challenges of applying research that is specific in context to questions that are expansive, certain studies on synchronization and correction have exciting implications regarding timing in ensemble settings. Synchronization refers to the ability of an individual to perform an action (for example, creating a sound) in time with an isochronous pulse. In his article entitled “Musical Synchronization,” Bruno H. Repp calls this process “sensorimotor synchronization” (SMS) and describes it as “the

---

9 Burrows, 101-102.

coordination of rhythmic movement with rhythmic sensory stimuli” and as “a universal human skill that is fundamental to music and dance.”"¹¹ Correction refers to the manner in which an individual will adjust in response to their own deviations from the pulse, or in the case of a pulse that is fluctuating, adjust to the aberrations of the pulse. Being apprised of correction tendencies is advantageous in understanding interactions in ensembles.

Also applicable to the subject of collective timing is the research of Michael Thaut regarding strong connections between the auditory cortex and motor function; connections that imply that physical reactions to auditory stimuli may often precede judgment. Given the value of primary sources in scholarly writing, the author has made note of the fact that the majority of recent articles reviewed regarding temporal cognition (those published within the last decade) do not fail to reference Thaut’s book, Rhythm, Music and the Brain.¹² Thaut’s field is that of neurologic music therapy, and the purpose of his work is primarily clinical in nature. The value of his research extends far beyond clinical application, however, and his book is regarded as one of the pillars of thought on the mind’s processing of rhythm. An array of studies is chronicled in detail and conclusions are set forth that have intriguing ramifications for the practice and teaching of musical timing.

The final classification of published works that relate to the topic of collective timing in swing is the category that includes jazz instructional books and methodologies.


Such books are abundant, and ironically, tend to begin with the disclaimer that it is not advisable to attempt to learn to play jazz from a book. The vast majority of manuals for the study of jazz concern themselves primarily with harmony, albeit often in both vertical and linear manifestations. Yet it is common to see a jazz instructional book that dedicates no more than a sentence or two to the subject of timing. There is often nothing beyond the admonition that time is important and that the student should practice with a metronome. Those that attempt to delve deeper are those that have been compiled for reference in this paper. Yet even these sources stop short of addressing the interactive subjectivities of players in an ensemble.

Jerry Coker is a widely renowned jazz educator and contributed to the formation of several college music programs in the United States, most notably the highly competitive programs at the University of Miami and the University of Indiana at Bloomington. Coker has written several books on jazz pedagogy. *How to Practice Jazz* is a small volume that primarily imparts guidance on the harmonic aspect of learning to play jazz, but on the subject of tempos, Coker self-references another of his publications, *The Teaching of Jazz*. Exercises for playing fast tempi are prescribed in this longer work, and Coker points out that the practice of fast tempi will aid a player with other facets of their time playing as well.

Emphasis is given to diagnosing the problems that may be interfering with the player’s execution of the music at fast tempi. Deficiencies in technique, focus and phrasing are enumerated as likely causes of difficulty. Coker writes that even players who

---


do not suffer these challenges will have a tempo “breaking point” at which these problems will likely manifest. He goes on to describe practice strategies for improving up-tempo playing and recommends standard tunes from the jazz repertoire on which to practice those exercises. Other than mentioning that a lack of focus (perhaps due to the mental rigors of improvisation) can cause a soloist to fail to synchronize in a satisfying way with the pulse “provided by the drummer and bassist,” Coker does not cover advice on practicing for the interactive side of swing time keeping.

Pianist Hal Galper published a book entitled *Forward Motion* that integrates melody, harmony, meter, syncopation and other musical elements in a comprehensive framework for understanding music as a system that progresses towards points of rhythmic and harmonic resolution. Galper’s book is aimed at solving musical problems that are “perceptual in nature,” and as such pertains to swing timing in a group context. Explicit reference to the interdependence of timing between the players in an ensemble, however, is not discussed.

The improvisation curriculum at Berklee College of Music for many years revolved around a book by trombonist and jazz educator Hal Crook. Crook’s book, *How to Improvise*, is a robust compilation of practicing strategies that target distinct aspects of a player’s musicianship. There is a segment dedicated to time feel that includes exercises. Interestingly, Crook recommends practicing with and without a metronome. The stated objective of Crook’s exercises is to become capable of “…. hooking-up with

---


16 Ibid., 14.

the time, of committing to the tempo, of defining the time with their playing….”

No strategies are offered for timing practice in a group setting, nor are any suggestions put forth for dealing with challenging time keeping situations with other players.

*The Guitarist’s Guide to Composing and Improvising*, by Jon Damian, is oriented towards guitarists, yet much of the content is applicable for other instrumentalists. Damian’s discussion of time practice is creative and unconventional. He recommends a series of exercises that involve muting the strings of the guitar with the left hand and plucking the muted strings with the right hand in order to isolate the element of rhythm. He calls this playing guitar in “drum mode.” One of the exercises in drum mode involves listening to records and copying the rhythms of each of the players. This is a great way to absorb swing timing by osmosis, and other instrumentalists, with a modicum of ingenuity, can adapt the practice to their instruments. He also proposes a pulse exercise that consists of moving through subdivisions relative to a pulse while maintaining a visualization of something in nature that is cyclical as a guide.

Damian writes that he invented “drum mode” in order to “…. help increase [my] rhythmic awareness when playing with other people.” This sentence represents the only perspicuous statement of intent to practice specifically for the context of interaction that the author has encountered in any instructional book on jazz. The rarity of such a declaration is striking, and is indicative of the fact that the topic of collective timing in swing merits scholarly inquiry.

---

18 Crook, 32.

Saxophonist Dave Liebman, who also lent the depth of his experience to this project by means of an interview conducted by email, has authored a book entitled *A Chromatic Approach to Jazz Harmony and Melody*. While this book primarily deals with melody and harmony, the sub-chapter entitled “Practical Considerations” contains some sage words on rhythm section interaction. Although Liebman does not directly address the ways in which players react to pushing and pulling in one another’s playing, he writes eloquently on the subject of the goals of the rhythm section, and the mentality that supports the attainment of said goals. The aim, in Liebman’s view, is to “create interest and inspire the soloist to higher heights.” The soloist must allow the rhythm section to participate in this manner by leaving enough space for them to do so.

Veteran drummer Peter Erskine has published a book entitled *Time Awareness for All Musicians*. Erskine’s book covers a vast range of topics related to musical timing, with an emphasis on building awareness. Erskine stresses that subdividing the beat, internally or even verbally, is tantamount to accurate timing. Exercises are provided that involve executing the same passage of music while employing varied mental subdividing

---


21 Ibid., 77-80.


23 The term “subdividing” refers to the act of dividing the pulse of the music into smaller component parts. Skilled players are constantly subdividing the beat, albeit at times unconsciously. The ability to subdivide is fundamental to all musical endeavors. The success of the timing of an ensemble depends upon the players in the ensemble feeling the subdivision together. Rhythm section players have a role that naturally encourages attention to the subdivision. It is of the utmost importance that all musicians, including wind players and singers, practice and sustain an awareness of the subdivision even though they may not be constantly manifesting the subdivision in sound. Hence Erskine’s emphasis on the inclusion of all musicians in the title of his publication.
techniques. An admonition is made against depriving notes and rests of their full value, as Erskine sees that as one of the most common causes of inconsistent timing. An aspect of the content of *Time Awareness for All Musicians* that is especially pertinent to the topic of interaction in swing is the discussion of knowing one’s tendencies. Erskine counsels that players should take steps to be aware of their own leanings regarding speeding up and slowing down, yet cautions that being overly concerned with the habits of others can be distracting from the music itself. There is a metacognition implicit in this advice, which points to the fact that one of the predilections musicians will exhibit in challenging scenarios is that of becoming self-conscious about time unto the point of undermining their own confidence. In other words, being aware of one’s tendencies extends beyond knowing if one has a propensity to rush or drag. One can become cognizant of how one tends to react.

In addressing the hazards of becoming preoccupied with time, unto the erosion of focus on the music as a whole, Erskine broaches a subject few instructional methods touch on; he considers the ways in which a player’s time is likely to be affected by that of the others. A pattern begins to emerge in which certain progressive and thoughtful publications emphasize awareness, introspection and attitude alongside accuracy and metronomic consistency.

**Summary**

Music and time, in their nature, share some paradoxes. They are ethereal yet quantifiable. They are basic to human experience yet they persistently defy definition.

---

24 Erskine, 18.

25 Ibid., 41-42.
They can be construed poetically as well as they can be described analytically. It is therefore incumbent upon any study of time in music to draw upon a range of resources that includes both the humanities and the sciences. Anecdotal wisdom and recorded music are as meaningful to this endeavor as are the works referenced in the philosophical, scientific and methodological categories.

Kramer offers this cogent statement of the need for a multifaceted approach to the study of time in music in his opening chapter:  

....I am unwilling to forego totally the quantitative or to oppose it to the qualitative. The two must coexist… It is as problematic to err on the side of excessive humanism as it is limiting to use exclusively (pseudo-) scientific methods.

It has been the author’s ambition to emulate the holistic and flexible mindset of Kramer’s scholarship in the gathering of resources for this doctoral essay. The reader is encouraged to view the bibliography section which points to a robust agglomeration of scholarly and research-based writing on timing in music, along with a variety of methodologies and instructional publications. Works listed in the bibliography include those that influenced the formulation and limitation of the topic and extend beyond those cited in the paper.

---

Chapter 3

METHODOLOGY

Data Gathering

The process of data gathering consisted of three research components; interviews with reputable sources, the analysis of classic recordings (selected through the interview process) and a recording exercise in Protools with student musicians. The interviews were conducted with saxophonist Dave Liebman, drummer Steve Johns and guitarist John Hart on the subject of swing timing in ensemble playing.

Interviews and Classic Recordings

The interviews were conducted via email and consisted of five specific questions:

• How have you personally worked on your time?

• How do you teach time?

• Is swing metronomic?

• What should one do when someone in the ensemble is rushing or dragging?

• Can you point to a few recordings that you consider to be examples of superb musical timing?

These questions are designed to prompt the interviewee to write about their experience practicing and performing, interpersonal dynamics in ensemble timing and problem-solving in challenging situations. What follows is a comparison and contrasting of the written responses in each interview, also bringing to bear the content of existing relevant
literature. Conclusions will be drawn about best practices regarding musical timing in the classroom and on the stage.

The recordings recommended by the interview subjects as exemplary of well-executed swing playing were evaluated in light of the comments taken from the interviews. The analysis endeavored to locate definitive instances of the most important principles described in the interviews.

**Metronome Study**

A study was conducted in which skilled musicians recorded to a metronome that was altered to simulate common real-life time imperfections during ensemble playing. The sample size is, of course, minute, consisting of only four individuals, and subsumes a vast number of external variables exist but is nonetheless useful in determining how the study might suggest further more scientifically rigorous research.²⁷

The purpose of the metronome study was to gain some insight into the tendencies musicians exhibit in correcting and compensating small variations in the phase or period of a steady beat. Even with a small sample size, the study illustrates the need to bolster and add to the awareness of music students, music educators and professional performers about the dynamics of time fluctuations in ensemble playing.

Moreover, there are countless other ways to go about conducting such a study, and consideration has been given to possible variations. A discussion of potential adaptations of the metronome study is included in the final chapter in the section dedicated to suggestions for further research.

---

²⁷ Therefore, the author offers the disclaimer that the study described herein is not conducted with intent for inclusion in peer-reviewed scientific journals or psychiatric journals.
A rhythm section comprised of Frost School of Music students recorded several iterations of the same short piece of music at two tempi; a medium swing tempo, 132 beats-per-minute (bpm), and a “medium-up” tempo, 216 bpm. The recording ensemble included guitar, piano, upright bass and drum set. The piece recorded was “Bloomdido,” a twelve-bar blues by Charlie Parker. The arrangement consisted of seven choruses of the form, the first of which was an iteration of the melody by the guitar, accompanied by the other instruments. The subsequent two choruses were dedicated to a guitar solo, followed by two choruses of piano solo. The final two choruses were given to trading of four bar phrases between the drum set and the guitar and piano. The performance ended after the choruses in which the players traded four bar phrases, the melody was not re-stated.

The variable in this experiment was the click track. The piece was recorded three times at each of the two tempi. One iteration per tempo was recorded with a precisely isochronous click track. The second recording for each tempo was made with a click track that had programmed aberrations to simulate inconsistencies frequently observed in student ensembles. The final iteration at each tempo was recorded with no click track, as an additional point of reference. A two-bar count off was provided at tempo, however, in the version with no click track. This allowed for an evaluation as to how much the tempo moved in the course of the performance when the absolute reference of the metronome was removed, which was pertinent to the issue being investigated with respect to what extent swing is metronomic.

In the interest of being able to measure the distance of events in the recording from the isochronous grid within the Protools software, each fluctuation in the metronome in the second iteration at each tempo was followed by its inverse function. In
other words, whenever a metronome rushes for a number of bars, the difference between
the modulated click track and the underlying tempo of the Protools session was
compensated by means of the metronome dragging by the same magnitude for the same
number of bars. In this manner, each tempo modulation event concluded with the click
track resynchronized to the isochronous grid of the session.

The manner in which the modified click track was programmed was by
percentage of the period of the beat. The reasons for utilizing this method are three-fold.
Diminishing and augmenting the period of the beat allows for relatively simple MIDI
programming of tempi change, via arithmetic, through the device of PPQ (pulses per
quarter note), which is a standard term for time quanta in most DAWs (digital audio
workstations). Secondly, altering the click track by percentage of the period allows for
the track to be easily employed at a range of tempi, as the adjustments made in PPQ will
remain proportionate even when the actual period of the beat has changed along with the
increase or decrease of tempo. Lastly, the research of Michael H. Thaut, from which the
design of this study takes inspiration, describes the threshold of conscious perception of
changes in a pulse in terms of percentage of the period of the pulse, as opposed to
milliseconds or frequency in beats per minute.\textsuperscript{28}

The first chorus of the form of “Bloomdido” in the modified click track did not
contain any deviations from the isochronous grid. It was the intention that the players
should have an adequate amount of time to internalize the tempo and feel grounded and
comfortable before any changes were introduced. The click track sped up in the second
chorus and slowed down in the third chorus, by a magnitude of two percent, which was

intended to be below the threshold of perceptibility. The purpose of this modulation was to simulate a situation in which the tempo moved so gently and gradually as to go unnoticed.

In the fourth chorus, the fourth beat of the fourth bar was truncated by five percent and in the fourth beat of the eighth bar it was elongated by five percent, to return to the underlying grid of the session. The fifth chorus is structured like the fourth chorus, but the magnitude of the truncation and elongation was raised to fifteen percent. The purpose of this modulation was to simulate the common situation in which the tempo is stable but a player in the ensemble rushes or drags a fill or line at the end of a phrase, causing uncertainty or discomfort in the following bar.

The sixth and seventh choruses were structured like the second and third, but by a magnitude ten percent. This modulation simulates a scenario in which a player within the ensemble has departed from the tempo dramatically and the other players react- consciously, unconsciously or both- to the sudden change in the period of the beat.

The magnitudes of the modulations applied to the modified click track find their derivation in Thaut’s research, but were adjusted to better simulate a real life scenario. Specifically, Thaut estimates the threshold of conscious perception of change to be about five percent of the period of an isochronous pulse.29 The author initially programmed a modulation in which the period of the beat shortened by five percent over the interval of one bar. The effect of this was dramatic and definitely well within the range of conscious perception, so a gentler modulation was applied in order to go unnoticed by the musicians.

29 Thaut, 42-43.
Thaut himself acknowledges and has studied differences in the way non-musicians and individuals with advanced musical training will respond to complex tasks relating to timing.\textsuperscript{30} After trying out several variations on the modulation, the author concluded that a reduction in period of two percent over the course of two bars was more appropriate for landing below the threshold of conscious perception within a group of trained musicians. As the other modulations programmed were intended to be consciously perceived to a degree that the magnitude of players’ reactions might be observed, those modulations ranged from five percent to fifteen percent.

The programming of the click track was done in Logic Pro X and the audio from both the isochronous click and the modulated click were exported as audio files to be used in the Protools session at the time of recording. Thus timbral consistency in the click tracks was maintained. Since Logic Pro X, like most DAWs, operates at 960 PPQ, it was a matter of arithmetic to program the modulations by percentage of the period of the beat. For example, two percent of the beat is two times 9.6 PPQ, or 19.2 PPQ, and as there is not a decimal level of refinement to PPQ, two percent of the beat would be rounded to 19 PPQ. Thus, each beat in the bars that rush would be of a length of 941 pulses per quarter note, therefore arriving 19 PPQ ahead of schedule for the next beat and moving cumulatively out of phase with the underlying grid of the session.

Although arduous, it was feasible to create a modulation to a faster or slower tempo measured by percentage of the period as opposed to beats-per-minute or milliseconds. Furthermore, to avoid suddenness of change, the simulations of rushing and dragging ascend gradually to the number of PPQ required by the desired percentage, over

\textsuperscript{30} Thaut, \textit{Rhythm, Music and the Brain}, 51-52.
an interval of two bars. The numbers used to program the first three bars of the modulation in the second chorus of “Bloomdido” are set forth in table 3.1.

Table 3.1 Click Track Programming with PPQ in Logic Pro X

<table>
<thead>
<tr>
<th>Bar and Beat</th>
<th>Length in PPQ</th>
<th>Displacement from Grid</th>
<th>Coordinates within Logic</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-1</td>
<td>960</td>
<td>0</td>
<td>13 1 1 1</td>
</tr>
<tr>
<td>13-2</td>
<td>958</td>
<td>0</td>
<td>13 2 1 1</td>
</tr>
<tr>
<td>13-3</td>
<td>956</td>
<td>2</td>
<td>13 2 4 238</td>
</tr>
<tr>
<td>13-4</td>
<td>954</td>
<td>6</td>
<td>13 3 4 234</td>
</tr>
<tr>
<td>14-1</td>
<td>952</td>
<td>12</td>
<td>13 4 4 228</td>
</tr>
<tr>
<td>14-2</td>
<td>950</td>
<td>20</td>
<td>14 1 4 220</td>
</tr>
<tr>
<td>14-3</td>
<td>947</td>
<td>30</td>
<td>14 2 4 210</td>
</tr>
<tr>
<td>14-4</td>
<td>944</td>
<td>43</td>
<td>14 3 4 197</td>
</tr>
<tr>
<td>15-1</td>
<td>941</td>
<td>59</td>
<td>14 4 4 181</td>
</tr>
<tr>
<td>15-2</td>
<td>941</td>
<td>78</td>
<td>15 1 4 162</td>
</tr>
<tr>
<td>15-3</td>
<td>941</td>
<td>97</td>
<td>15 2 4 143</td>
</tr>
<tr>
<td>15-4</td>
<td>941</td>
<td>116</td>
<td>15 3 4 124</td>
</tr>
</tbody>
</table>

The players at the recording session were debriefed of the fact that there would be some fluctuations in one of the click tracks, but they will not know which recording would contain the changes, nor the specific nature of the modulations. All of these recordings were saved in a Protools session with the grid set to the original tempo, thus allowing for the aural and visual analysis of beat placement of the different instruments.
The purpose of this exercise was to gain insight into the tendencies of musicians in the act of correction and adjustment.

**Data Analysis**

Having conducted and recorded interviews, the author scrutinized the interviews to make note of that content which was most pertinent to the subject of improving one’s musical timing in relation to one’s fellow ensemble players. The endeavor was to seek to forge connections between the anecdotal wisdom harvested from the seasoned performers, ideas put forth in theoretical and philosophical treatises on musical timing, data reported in scientific research on temporal cognition and the results of the timing study.

The click track experiment, having been recorded in Protools sessions at set tempi, was analyzed by examining the distance of transients in the audio from the grid, or from the click in those instances in which the click was out of phase from the session. The amount of data generated by recording six takes of a quartet performing a piece that is eighty-four bars in length was unnecessarily large. Therefore, the evaluation of the session players’ reactions was honed in on the beats and bars immediately following the programmed alterations in the click track.

Specifically, this refers to the slight positive and negative accelerations in the first six bars of the second and third choruses, respectively, the truncations and elongations of the fourth beat of the fourth and eighth bars respectively of the fourth and fifth choruses, and the more dramatic positive and negative accelerations in the first six bars of sixth and seventh choruses, respectively. The corresponding takes in the track recorded with the unaltered isochronous click track and the track recorded with no click track were
compared with the experimental track to yield observations about the players’ reactions to the non-isochronous events that occurred.

Prior to the experiment, the author predicted, based on tendencies observed by Thaut and his colleagues in research referenced in *Rhythm, Music and the Brain*, that there would be a threshold of deviation within which the players would not notice aberrations in the click track and would follow the migrating click away from the underlying grid of the Protools session. It was surmised that beyond that threshold, the musicians would attempt to compensate for the irregularity of the click and resynchronize with the underlying grid, and likely would overcompensate. The number of beats and bars it takes the musicians to normalize was of particular interest as it would provide information regarding the aspect of musical timing that is relative versus absolute. Upon completion of the gathering and analysis of data, the task was undertaken to extrapolate conclusions synthesizing the information gleaned through the reading, interviews and the experiments.

---

31 Thaut, *Rhythm, Music and the Brain*, 41-42.
Chapter 4

THE INTERVIEWS

Three veteran performers consented to be interviewed via email on the subject of time in swing music. These three individuals are considered to be reputable sources due to their robust experience playing swinging music and their association with some of the historical greats of jazz music. The questions posed in the interview were designed to gain insight into the practicing and teaching habits of these seasoned performers, discover their perspective on the nature of swing and explore possibilities for problem solving in challenging situations. Additionally, each performer was asked to recommend recordings that provide examples of masterful musical timing.

The questions proposed in the methodology are reiterated here for the convenience of the reader:

• How have you personally worked on your time?
• How do you teach time?
• Is swing metronomic?
• What should one do when someone in the ensemble is rushing or dragging?
• Can you point to a few recordings that you consider examples of superb musical timing?

Following a summary and interpretation of the responses of each participant, an analysis is set forth identifying commonalities and differences between their points of view. Within that comparison, consideration is given to the recordings recommended by the
interviewees and to what qualities these recordings share that lend to their greatness. The transcripts of the interviews are included verbatim in the appendix.

The Responses of Dave Liebman

In describing how he developed his musical timing, saxophonist Dave Liebman makes mention of the technique of practicing with the metronome corresponding to beats two and four of the bar. Furthermore, Liebman emphatically asserts that one develops excellent timing by working closely with people who have it. The time he spent studying with Lennie Tristano and the time he spent playing with Elvin Jones were of particular significance to his musical development. On the subject of playing with Elvin Jones, Liebman states that “it is great to play with someone who has a patent on a certain feel.”

A close examination of the language Liebman uses to describe playing with Elvin Jones yields two implicit ideas. First, an individual can possess a unique way of relating to time in music. Second, originality is to be celebrated and is a privilege to work with. The fact that Liebman chooses to impart the value of his experience with Elvin Jones in the section of the interview pertaining to his musical development and training underscores that point that musicians grow, above all else, through interaction with one another.

Whereas Liebman recollects that he used to practice with the metronome corresponding to beats two and four of the bar, he states that he often suggests that students practice with the accent of the metronome occurring only once per bar. The “landing point” of the metronome can correlate to any point within the eighth-note grid, for example, beat one, the and of one, two, the and of two, etcetera.
Students of all instruments are encouraged to practice playing the swing ride cymbal pattern on a ride cymbal. The swing ride cymbal pattern, often colloquially referred to as “spang-a-lang,” consists of a quarter note on beat one, two eighth notes on beat two and the and of two, a quarter note on beat three, and two eighth notes on beat four and the and of four. In swing, it is typical for the eighth notes to be unequally proportioned, with the first eighth note being longer and the second eighth note being shorter. Since the triplet subdivision underlies swing music, the first eighth note is often given the duration of two eighth note triplets and the second eighth note given the duration of one eighth note triplet, especially at slow and medium tempi.

It is also possible for the eighth notes to be proportioned in line with a sixteenth note underpinning, with the first eighth note having the duration of a dotted eighth note and the second eighth note having the duration of a sixteenth note. Certain time feels involve a ratio of the first eighth note to the second eighth note that falls in between the triplet subdivision and the sixteenth subdivision. The ratio can also lie between that of the triplet subdivision and the even eighth note. Such a division is common at higher tempi at which the difference between half of the beat and two thirds of the beat, as measured in absolute time, becomes negligible. Thus the division of the eighth notes has a tendency to become more even as the tempo increases.

In whatever way the eighth notes might be proportioned, the ride cymbal part can be placed somewhat out of phase, ahead or behind the beat. A straight eighth note division is sometimes placed behind the beat so that the second eighth note implies the location of the third partial of the triplet. Eighth notes proportioned based on the triplet subdivision can be placed behind the beat in a way that the third partial of the triplet
begins to hint at the fourth sixteenth note. Elvin Jones’ drumming on “Tunji” provides a good example of this phenomenon.\footnote{John Coltrane, “Tunji,” on \textit{Coltrane}, recorded 1962, Prestige 15731087, 1987, compact disc.}

The swing ride pattern, although easy to express on paper, is a complex and subtle art. Liebman clearly regards it as they key to understanding swing timing for all instrumentalists. For this reason, students are advised to play along with great drummers on classic recordings. Liebman’s two approaches to teaching time therefore involve both metronome work and osmotic absorption of human timing from highly skilled players.

Regarding swing, and whether or not it is metronomic, Liebman states that “some elasticity is desirable.” The specifics of the language he chooses merits consideration. Elasticity is physical property of matter, yet the term is applied to time, which is intangible and ephemeral. The application of physical terminology to the understanding of temporal properties is consequential and has significant bearing on the endeavor of learning to interact optimally with other players.

The word “desirable” is also noteworthy in that it was chosen over a more neutral word, such as “acceptable” or “allowable.” The implication is that flexibility is actually preferable to a rigid metronomic adherence. As to how one should react to another player’s rushing or dragging, Liebman offers that it is better to be pliable than tense. One could interpret this to mean that there exists a threshold beyond which one cannot be overly attached to the tempo without the music becoming uncomfortable; a threshold beyond which it is better to be responsive than to be right.

Similarly, Liebman attests that when players “agree to disagree,” that is when things start getting really good. The beat is an area, not a point, and differences of
opinion as to where the center of that area lies do not make the music flawed, but rather make the music richer and give it depth. Again, physical terms, “area” and “point,” are used to describe time. The author interprets “agreeing to disagree” as a description of a scenario in which the period of the beats is fairly consistent, but a trust exists between the players that allows them to play out of phase with one another without second-guessing the period of the beat. The concepts of phase and period will be explored in greater detail in chapters five and six.

As to recordings that provide examples of masterful swing, Liebman recommends a version of Miles Davis playing “No Blues” live on the Steve Allen show, Frank Sinatra “Live at the Sands” (especially “Fly Me to the Moon”), John Coltrane’s “Tunji,” and Miles Davis’ “Four” from the album “Four and More.”33 The latter Liebman describes as “rushing at it’s best”- a statement that reinforces the assertion that great swing need not be static in tempo.

The Responses of Steve Johns

Drummer Steve Johns notes the importance of the use of the metronome in his practicing. As slow tempos present a greater challenge, in Johns’ experience, he gives special attention to slower tempos, and employs the strategy of subdividing the beat in different ways. Specific comment is given to eighth note triplets, sixteenth notes and quarter note triplets. Johns highlights the merits of daily practice in attaining a regulated tempo. This constitutes a rare instance of a prescription for the frequency of metronome

practice. Johns also notes, however, that tempos rise and fall over the course of long pieces of music, even with excellent players, and that this is not a problem. It is more consequential that the music should feel natural. Later in his responses, Johns remarks that swing is not metronomic and “should breathe and flow naturally like the wind in a sail.” Johns further asserts that ultimately, it all comes down to awareness.

In regards to teaching, he assigns students to work out of a variety of books containing patterns and permutations, spanning a range of levels of difficulty. A constant awareness of where the quarter note is the goal. After practicing such material with a metronome, it is also advisable to practice without a metronome.

In a context in which someone in the ensemble is rushing or dragging, Johns advocates that they be told that they are doing so, because most likely they are not aware that it is taking place. The player who desires to play with excellent timing should be concerned enough to make an effort to remedy the situation.

The recordings of Frank Sinatra with the Count Basie band are once again referenced as an example of time that feels exquisite, along with anything by the Basie band.\textsuperscript{34} Likewise, anything by Art Blakey and the Jazz Messengers is recommended.\textsuperscript{35} Lastly, Johns points to the Chick Corea “Friends” session and gives specific mention to Steve Gadd’s remarkable timing.\textsuperscript{36}

\textsuperscript{34} Sinatra.


The Responses of John Hart

Guitarist John Hart also reports that practicing with the metronome corresponding to beats two and four of the bar was a critical part of his training. Hart declares that an additional benefit of metronome work, beyond improving one’s precision and constancy, is that one becomes familiar with common tempi and the subtleties of playing at said tempi. Yet playing strict metronomic time and playing with “good feel or groove” do not equate exactly in Hart’s opinion. Hence he is a strong proponent of spending a great deal of time listening to the masters and trying to emulate their playing. Gaining the proper rhythmic vocabulary for the style, and the tempo, is apposite to playing great swing. The same processes that Hart followed in the development of his musical timing are the ones he instructs his students to follow.

While Hart acknowledges that swing is not necessarily metronomic, he offers the observation that student ensembles that are rushing or dragging tend to sound vastly improved when a metronome is introduced. In a related comment on solutions to rushing and dragging, Hart tells us that, “The idea is to play with a degree of rhythmic assurance that makes it impossible for other band members to not groove with you….” In other words, one can play with such a degree of confidence and accuracy that one can affect the ensemble in much the same way the metronome would. This can be achieved through working on one’s personal time to the extent that tempos are familiar and one understands where to place the beat at a given tempo.

Certain situations, however, will require even a player with superb time to adapt to and work with the tendencies of the other band members. Responsiveness and
compromise are necessary at times, and outstanding players know how and when to be malleable.

The examples of recordings with great time are too abundant for Hart to hone in on definitive examples, and he contends that there are few, if any recordings of the masters that do not swing. Instead Hart points to an instance of stark contrast between four tremendous solos within one piece on Miles Davis’ *Kind of Blue*. The first four solos on “Freddie the Freeloader” are played by Wynton Kelly, Miles Davis, John Coltrane and “Cannonball” Adderly.\(^{37}\) Hart sees this is as an illustration of how the time can be exquisite in many different ways. Also noteworthy is the fact that Miles Davis’ centered time works equally well with different rhythm sections across decades, and spanning several evolutionary steps of stylistic approaches to rhythm section playing.

**Commonalities and Differences**

All three experts interviewed, in response to the query into how they developed their time, report that they practiced with the metronome. Dave Liebman and John Hart both specify that they have practiced with the metronome on the half-note, corresponding to two and four. This technique has become widespread in jazz education. Becoming familiar with common tempos, similar to how one can become familiar with a key, is as much the reason for metronome practice as accuracy and consistency, according to Hart. Steve Johns emphasizes the importance of practicing at slow tempi and employing the technique of subdividing mentally. Johns also specifies that metronome practice should occur daily.

\(^{37}\) Miles Davis, “Freddie the Freeloader,” on “Kind of Blue,” Columbia CS 8163, 1959, 33 1/3 rpm.
While the details of each respondent’s purpose for and use of the metronome are nuanced and unique, there is a unanimous accordance amongst those interviewed that metronome practice was a significant aspect of their musical development. This agreement further corresponds with the assertion in many methodologies that metronome work is valuable. Peter Erskine, Hal Crook, Jerry Coker and John Damian all make reference to the use of the metronome in their respective manuals of study.38 The processes espoused by the professionals interviewed elide with those recommended in the publications reviewed; an unsurprising concurrence that shows the degree to which metronome practice is a standard facet of jazz pedagogy.

Yet those modes of learning mentioned by the interviewees that involve the timing of other people, as opposed to just the metronome, are of distinct relevance to the subject of an evolving pedagogy for teaching swing. Liebman impresses the point that the ability to swing is passed along from individual to individual through playing together; a sentiment that Hart echoes, but with emphasis on going to records to absorb swing timing through emulating master players. Both edicts underscore the pertinence of a holistic training for timing that goes beyond merely working with a click. Whereas the metronome is indispensable for strengthening one’s internal clock, human elements of timing, often related by metaphor to physical phenomena like “swing” or “bounce” or “groove,” are best absorbed person to person or through recordings.

---

All three respondents describe aspects of their educational methodologies that do involve the metronome and aspects that do not. In the case of Dave Liebman, he assigns advanced metronome practice strategies, as outlined above in the summary of his interview, and also students to play a ride cymbal along with recordings. Hart suggests that students emulate the timing of players on great records and will put on a metronome in an ensemble to help the group’s timing coalesce. Johns has students practice challenging patterns and permutations, first with a metronome but ultimately without. Again, unanimity emerges between those reputable players and educators interviewed regarding the importance of the metronome in developing the foundations of good timing and the need to transcend the metronome and harness the human in achieving great timing.

Swing, according to Liebman, Johns and Hart, is not metronomic. It is fascinating and instructive to observe that two out of three rely on metaphoric linguistic devices to describe the ways in which swing is not metronomic. Liebman’s relation of swing to elastic and Johns’ comparison of the flowing nature of swing to the wind both give testament to the universal tendency to conceptualize music through one’s experience of the physical world.

Of the questions posed in the interview, the fourth question, which inquires into what should be done when someone is rushing or dragging, received the most varied responses. Liebman holds that “agreeing to disagree” yields desirable results; a statement the author interprets to mean that one should, to some extent at least, be assertive about where one perceives the beat and tempo to lie. In so doing, one offers the other players the opportunity to do the same. However, Liebman also puts forth that the music should
be “….pliable, not tense….” The author translates that to mean that if being assertive about beat placement or tempo is causing the music to feel uncomfortable, one should be responsive, prioritizing the feel of the music over accuracy.

Although the manner of expression is distinct, this is fairly consistent with the wisdom imparted by John Hart. Hart states that one can play with so much assurance that the other players cannot help but fall in sync; a presentment that aligns with Liebman’s outlook. Furthermore, Hart acknowledges that there will be circumstances in which players will be exhibiting tendencies that even one’s most confident time playing cannot override, and in such situations it is necessary that one should be adaptable and willing to compromise, for the overall good of the music.

The responses of Liebman and Hart both suggest the existence of a threshold at which one needs to adopt, consciously or unconsciously, a different schema for relating to the time of the other players. The idea of thresholds at which timing behavior changes will be discussed in detail in chapters five in six in relation to literature on the workings of the mind in relation to rhythm. It is noteworthy that the existence of such thresholds is implied in the advice given by seasoned professional performers regarding how one should react in challenging musical situations.

Steve Johns, who declares that awareness of time is, above all else, what one needs to develop, advocates that a player who is rushing or dragging should have that tendency brought to their attention. Johns also points out that if someone is rushing or dragging, they are most likely not doing it deliberately and that it therefore they are most likely unaware. They should want to become aware, and should care enough to correct the problem. It is the author’s opinion that such an elucidation requires a fair amount of
trust between players. Music is, in addition to an art form, a social situation. The author is curious as to how such an admonition could be imparted in a constructive way, and in a manner that would not cause the music to suffer due to the self-consciousness of the player. It is notable that neither Liebman nor Hart address whether or not they would confront such an issue verbally.

**Suggested Recordings**

The responses to the fifth interview question yield an inventory of recorded musical performances that can inform the inquiry into what makes great swing. There is both overlap and variety within the selections, which are here consolidated into a small catalog of works prior to discussion for the convenience of the reader.

The breadth of material that exists and is available in the digital age is staggering. Considering this vastness, it is indicative of the special merit of “Frank Sinatra Live at the Sands Hotel 1966” that this recording was chosen as a reference by two out of three interviewees. Miles Davis and his ensembles also feature prominently in the list of recordings garnered from the interviews. “No Blues,” “Four” and “Freddie the Freeloader” are mentioned specifically and later recordings of Miles Davis with Tony Williams and Jack DeJohnette are offered up for comparison and contrast with Davis’ work with in the first quintet era.

Liebman points to John Coltrane’s “Tunji” as an individual track that he feels exemplifies great swing. Johns directs us to the album “Friends” by Chick Corea in its

---

39 Sinatra, “Fly Me to the Moon.”

40 Davis.

41 Coltrane.
entirety, with attention to Steve Gadd’s drumming in particular. He also provides a broader view, suggesting that the serious student should listen to any and everything recorded by Art Blakey and The Jazz Messengers. By choice of the author, the composition “One by One” will be examined.

**Frank Sinatra Live at the Sands Hotel 1966, “Fly Me to the Moon”**

One reason music is so compelling is that it expresses feelings and sensations that defy conveyance in mere language. Therefore, one begins at a disadvantage when trying to verbalize the elements that contribute to the magic of a performance like “Fly Me to the Moon” by Frank Sinatra and the Count Basie Orchestra, featuring arranger and conductor Quincy Jones, at the Sands Hotel and Casino in Las Vegas in 1966. Nonetheless, if qualification of some of the factors at work aids at all in emulating the greatness of the timing in this classic recording, the endeavor is worthwhile.

While each of the instruments and sections in the ensemble exhibit such exquisite placement that they could merit a complete doctoral essay unto themselves, the relationship between the bass and the drums stands out as a crucial salient feature of the swing feel of this recording. Norman Keenan on the upright bass plays a quarter note in his walking lines that is short, as in not the full duration of the quarter note. He plays the quarter notes in such a way that the subdivision is reinforced by the cut off of the notes. The quarter notes are cut off where one would expect them to be cut off if Keenan were playing swing eighth notes in his bass lines, but rather than sounding the second eighth-note, more often than not he omits it. He does, however, occasionally play both eighth

---

42 Corea.

43 Blakey.
notes, and more often than not when he does, it occurs on beat four, adding propulsion into the next bar.

The swing eighth note described above is that which aligns with the third partial of the eighth note triplet, as the tempo of the performance rests around 118 bpm; solidly in the range of tempi in which the eighth note triplet underlies the swinging eighths and below the range of tempi at which the eighth begins to straighten out. The eighth note triplet subdivision is felt constantly throughout the song and though consistent with the period, is somewhat back from the center of the beat in phase.

Complimenting the placement of Keenan’s immaculately shaped quarter notes is the laid back cross stick (and later full stick) backbeat of Sonny Payne. Payne mostly avoids playing the big band figures, choosing instead to accent beats two and four. Slightly further back from the center of the beat than underlying triplet grid, the interaction between Payne’s backbeat and Keenan’s walking bass creates a sense of something bouncing, or snapping back like a slingshot, while simultaneously moving forward. This timing relationship provides a great point of reference for the background figures in the ensemble. Meanwhile, Frank Sinatra himself is fairly centered on the beat, providing a strong anchor and thusly allowing the band to create dimension around him. Sinatra delivers the lyrics of the song with striking rhythmic variety and clearly has absolute command of the subdivision.

The pivotal factor in the way this band swings is how they place their respective parts in relation to one another. Simply playing to a click at 118 bpm does not yield a time feel of this depth and nuance. It is the ability of the players to keep a beat period that

---

44 Backbeat, in the context of music in four-four time, refers to a strong accentuation on beats two and four of the bar.
is isochronous, or at least nearly so, but to place sounds consistently out of phase with one another in a desirable way.\textsuperscript{45}

**Miles Davis, “No Blues”**

One interesting thing to notice in this performance is the reaction of the rhythm section to the content of Miles Davis’ solo versus Wayne Shorter’s. Davis frequently plays short, concise phrases in this solo that seem almost declarative. By the top of his second chorus on the short twelve-bar form, Miles is already taking risks and playing unconventional, rhythmically challenging material. The band responds to Davis’ directive rhythmic statements with an energetic underpinning that is interactive and exciting but relatively stable in its level of dynamic intensity.

In Shorter’s solo, by contrast, phrase lengths are on average slightly longer. There are short phrases as well, but longer phrases are more common. The rhythm section begins to raise the energy level almost immediately underneath Shorter’s solo, and by the end of Shorter’s third chorus, largely driven by Herbie Hancock’s tense, chromatically ascending “comping,” the band has arrived at a higher plane of energetic output. One can only speculate as to what degree this occurred as result of the soloing styles of Davis and Shorter, whether it was premeditated, or if it was simply a product of the order of solos. It is evident, however, that the rhythm section provided variety in the way they chose to accompany the two soloists.

The tempo in this piece is in the ballpark of 184 bpm. The first of every two eighth notes is a bit longer than half of the period of the beat, but it is closer to half of the

\textsuperscript{45} Sinatra, “Fly Me to the Moon.”
beat than it is to two thirds of the beat. In other words, the division of the eighth-notes is not perfectly straight but nor is it derived strictly from the eighth-note triplet.

Ron Carter plays fairly centered on the beat, leaning at times towards being slightly on top. Tony Williams plays minutely ahead of Carter, providing propulsion. Davis’ time is centered and commanding. Shorter places his time further back on the beat than Davis does. It is striking how different the feel of Shorter’s time is from that of Davis, and notable that it feels equally good with the rhythm section. Hancock’s time often aligns with the rhythm section, a little bit on top, but at other times sits with the centered time of Davis. At times he even lays back. It seems to depend on what sort of musical phrase he is reacting to. Hemiola rhythms are common in Hancock’s “comping.” Even within the context of a single piece of music, one can marvel at the distinct ways in which this band can swing.

Miles Davis, “Four”

This track was referred to by Dave Liebman in the context of the discussion of whether or not swing is metronomic. Liebman recommended this recording to demonstrate the fact that the excellence of the music is not compromised if the tempo moves. Indeed, the piece is so dazzling in its energy and intensity that it seems almost heretical to dissect and analyze it. Since insight stands to be gained, however, and no amount of deep listening is likely to dampen the enjoyment of such a performance, it is worthwhile.

In the beginning, it appears as though Miles Davis may have wanted to play the piece faster than Tony Williams started it. Davis enters with melody at a tempo that is above the tempo at which Williams played his introduction on the drum set. Williams
reacts quickly and drives the tempo aggressively with the ride cymbal during the melody. The time congeals tangibly at the beginning of Davis’ solo and remains stable.

During the ensuing saxophone solo by George Coleman, a tempo acceleration takes place that seems to start with Williams but transfers to Ron Carter. Williams and Carter are playing leap-frog with the tempo during the solos of Coleman and Hancock, taking turns spurring the tempo on.

Both Coleman and Hancock sound relaxed riding on this torrent of raw energy, as if they are being buoyed by it. The tempo definitely fluctuates within this section of the song, flirting with instability at moments but never losing control, and the exhilaration is palpable. The melody at the end of the performance is not at a drastically different tempo from the melody at the beginning. This is in part due to the fact that the half chorus of trading between Davis and Williams before the final melody serves as something of a reset. This is likely also due to the fact that the tempo, which is blistering, creates the illusion that the quintet is rushing more than it actually is.\footnote{Davis, “Four.”}

**John Coltrane, “Tunji”**

John Coltrane’s “Tunji” is played at a tempo only slightly slower than that of “Fly Me to the Moon” Frank Sinatra and the Count Basie Orchestra on “Live at the Sands,” but it is hard to imagine a more contrasting manner of swinging. Elvin Jones subdivides the beat in such a way that the first of every two eighth notes is longer than two conjoined triplets but shorter than a dotted eighth note. Jones’ grid is shifted back from center, creating a sense of enormous width to the beat. So far back is the beat of Jones’ ride that when he plays honest triplets, they seem to sit on top.

\footnote{Davis, “Four.”}
Bassist Jimmy Garrison possesses the magical ability to anchor the piece by playing downbeats with a firmly centered placement, but aligning with Elvin Jones’ impossibly laid back grid when subdividing. Although Garrison occasionally lends the ensemble some propulsion by playing a few quarter notes, he never walks. Pianist McCoy Tyner helps to reinforce the center of the beat. Steve Johns relates that swing should “flow freely like the wind in a sail.” In “Tunji,” Garrison’s downbeats and Tyner’s repetitive chording act like the mast that allows Coltrane and Jones to billow in the wind. It is affirming that an example selected by one interviewee would provide such a fitting illustration of a metaphor provided by another.

In response to McCoy Tyner’s playing, the subdivision played by Jones throughout most of the piece, which allocates slightly more than two thirds of the beat period to the first of the two eighth notes, is softened in the direction of a true eighth-note triplet underpinning during the piano solo. It is also observable that Jones is not hesitant to shorten a bar or a beat when coming up on an arrival point. This provides a good demonstration of the elasticity Dave Liebman testifies is desirable in swing.47

**Art Blakey and the Jazz Messengers, “One by One”**

Although “One by One” glides along some thirty-five clicks faster the “Fly Me to the Moon,” there are certain likenesses in the feeling of the swing. The quarter-note played by bassist Reggie Workman is longer than that of Norman Keenan, but nonetheless provides a strong sense of the swung eighth-note subdivision. In like manner to the relationship between Keenan and drummer Sonny Payne, here Workman provides a strong center against which drummer Art Blakey can play laid back. A further

---

47 Coltrane, “Tunji.”
resemblance exists in the way the triplet grid predominates the feel, and is set back from
the center of the grid. It is interesting to note, however, that Blakey’s triplet set up on the
snare drum is quite centered on the beat in contrast to his time playing.

Wayne Shorter’s playing is more centered in this band (or perhaps in this phase of
his evolution) than the playing heard in the recordings by the second Miles Davis Quintet
discussed above. Occasionally when playing longer note durations, Shorter’s time sits
back a bit, but when playing lines and sixteenth-notes, he sounds like a different Shorter
than the on featured in “No Blues.” Trumpeter Freddie Hubbard begins his solo playing
back on the beat. Upon reaching the bridge and bringing his solo to an intensely climactic
peak point, Hubbard plays a bit more on top. It is a dramatic effect.

Trombonist Curtis Fuller places the beat in such a way that he sits behind
Workman but ahead of Blakey, creating the sense that Blakey and Workman are cradling
him. Pianist Cedar Walton’s solo aligns very closely with Blakey’s subdivision. As John
Hart observed about the soloists on “Freddie the Freeloader,” this is an example of a
recording with soloists with strong individual characteristics, all of which work well.
Clearly, there is more than one way to swing. 48

Chick Corea, “The One Step”

“The One Step,” which was released in 1978, is the most recent chronologically
of the recordings recommended by the interview subjects. “The One Step” was chosen
from amongst the tracks on the Chick Corea record “Friends” because it is one of the few
tracks in a swing feel on this record and for the variety of “grooves” within that swing.
During the melody, the drum set plays a form of shuffle with a cross stick on the beat and

48 Blakey, “One by One.”
a signature Steve Gadd distribution of the triplet subdivision around the set in tasteful and imaginative ways. Gadd’s manner of playing swing is uniquely grounded in the kick drum. During the saxophone solo, Eddie Gomez moves to playing walking bass and Gadd plays the syncopated swung eighth-notes in his left foot on the high hat as opposed to playing the customary beats two and four.

The piece goes into double time during the keyboard solo. Gadd continues to defy conventional swing drum set playing during this phase of the piece, exhibiting variety and creativity in the placement of his left foot. Gomez walks in double time during this section, supporting the groove by playing frequent eighth-note pick up notes to the quarter-notes in his walking lines.

The piece, as a whole, rests on a triplet grid that is set back from the center of the beat, but only slightly compared to a track like “Tunji” by John Coltrane. All four players in the ensemble respect the grid quite closely, and the resulting feeling of the swing in this performance is much tighter. One is almost inclined to wonder if the piece was recorded to a click track- but then there may be very little difference between a click track and the flawlessness of Steve Gadd.

Miles Davis, “Freddie the Freeloader”

In recommending “Freddie the Freeloader” from Miles Davis’ “Kind of Blue” record, John Hart astutely pointed out that each of the soloists treats time in his own way, and that each treatment is ingenious. As Hart has already established that observation, the

---

49 Coltrane, “Tunji.”

50 Corea, “The One Step.”
discussion at this point will turn to the ways in which the rhythm section supports each of these unique conceptions.

Behind Wynton Kelly’s piano solo, which Hart characterizes as “classic piano trio groove,” bassist Paul Chambers plays triplet fills. Chambers’ quarter note also has that feel of containing the subdivision of the swung eighth-note, even when it is not actually articulated. Jimmy Cobb accents the quarter notes on the ride cymbal more than the syncopations, in keeping with his signature style. He plays a cross stick on beat two of every bar in Kelly’s third chorus and on beat four of every bar in Kelly’s fourth chorus. It is simple, tasteful and effective. The time between the three of them calls to mind an image of someone smiling broadly and snapping their fingers.

When Miles enters, with well-defined centered placement, Cobb adjusts his placement, almost imperceptibly, towards the top of the beat. When Coltrane enters, however, Cobb adjusts back, again subtly, and Chambers seems slightly more on top. In some microcosmic way, the manner in which Chambers and Cobb accommodate Coltrane seems to foreshadow the well-defined sound that Jimmy Garrison and Elvin Jones will later cultivate in the classic Coltrane quartet. By the second chorus of Cannonball Adderley’s solo, the incremental adjustments made by the band for Coltrane’s solo have been reversed to accommodate Adderly’s more top-oriented placement.

The level of familiarity with each other’s proclivities is evident in the cohesion of the time throughout. The soloists are assertive and commanding and the rhythm section
players are responsive, tastefully interactive and as solid as plank of wood. Each player defines their role in the ensemble flawlessly and not a sound is wasted.\textsuperscript{51}

\textsuperscript{51} Davis, “Freddie the Freeloader.”
Chapter 5

THE RECORDING SESSION

The data from the recording session was contained in two sessions within Protools version twelve, one for the tempo 132 bpm and one for the tempo 216 bpm. Each session contained three performances of the music: one with an isochronous click track, one with the click track modified to simulate common tendencies in student ensembles and one with no click track. To facilitate both the interpretive process and the creation of visual materials for illustration, the session was triplicated.

The original session was left unaltered so that it can be returned to in its original state at any point in the analytical process. The first copy was used to examine the performance with the isochronous click and the performance with no click in reference to the isochronous grid. Due to extremely minute differences of the clocking in Logic Pro X, in which the click tracks were made, and Protools version 12, a tempo map was created in the Protools session from the isochronous click track imported from Logic, in order to insure that the lines that appear in the Protools session correspond precisely to what the musicians heard whilst recording.

In the second copy, the “tab to transients” function within Protools was employed to reset the grid of the session to the click track that contained fluctuations, so that the performance recorded to the altered click can be inspected in relation to either the isochronous grid in the first copy of the session or to the grid generated by the altered click track to which it was recorded. This allows for the analysis to take into account how
the musicians were responding to both the established underlying tempo of the session and to the aural input of the aberrant click track.

The sessions are organized such that the three performances are visible as playlists under the heading of each instrument. Guitar, piano (Rhodes) and bass each have their own individual track containing separate playlists for each performance of the piece. The drum set is represented by four tracks, kick, snare and two overhead microphones. The microphone on the ride cymbal side is indicated by “OH Ride” and the microphone on the high hat side is indicated by “OH Hihat” in the track column. The top playlist under each instrument represents the first performance in which the musicians recorded to an isochronous click. The second playlist is the recording made with the altered click track. The bottom playlist is the performance made with out a click track. The players did, however, receive a two bar isochronous count off at each tempo prior to starting the recordings with no click track.

In Protools twelve it is possible to zoom in horizontally, vertically and also within the track to increase the size of the image of the sound wave. Additionally, tracks can be reordered such that any two instruments, or click tracks, can be placed adjacent to one another to aid in the task of comparing the location of the transients in the wave files. Zoom levels and track orders were chosen for ease of comparison of the location of the transients that indicate the onset of notes and sounds to the center of the beat as represented by the vertical lines of the grid within Protools. As the bass is often playing quarter-notes, the bass track is frequently used to illustrate the collective tendencies of the band.
Isochronous Metronome

The quartet seemed quite comfortable recording the isochronous click at the tempo of 132 beats-per-minute. Few instances occurred in which the quartet, or any individual member, drifted from the click. Those instances that did occur were slight. This is indicative of the excellent musicianship of many of the undergraduate students in the Studio Music and Jazz department of the Frost School of Music and provides an important contextualization for the other performances in this study; these young musicians are quite capable of performing complex improvisatory music in keeping with a click track. Therefore, when they respond to irregularities in the click track in the second performance, it can be inferred that the temporal distance between their transients and the grid points are a result of their reactions, not a product of their inability to synchronize with a metronome.

The only noteworthy discrepancy in the performance at 132 beats-per-minute with the isochronous click is documented in table 5.1. In the final two choruses of the twelve bar form the students improvised over, the students were trading four bar phrases between the harmonic instruments and the drum set. In the fourth bar of the final chorus, the drummer rushed his musical phrase, causing beat four to arrive early. This is clearly visible in the top playlist of the snare track in which a strong transient precedes the grid line 76/4 considerably.

Interestingly, the guitarist, who subsequently plays an anacrusis in sixteenth-notes to bar 77, is initially pulled ahead by the rushed fill but lands somewhat late on beat one of bar 77, as evidenced by the strong transient occurring after the 77/1 grid line. This seems to demonstrate a tendency observed by Michael Thaut; when the period of the beat
is inaccurate to the established tempo, a temporary over correction is likely to occur, and then be reabsorbed over the courses of several beats.\textsuperscript{52} This example is minimal in its scope. Other, more dramatic instances of this phenomenon were observed throughout the sessions.

**Table 5.1 Snare and Guitar, Bars 76-77, 132 Isochronous**

At the tempo of 216 beats-per-minute, the performance is slightly looser in general and does not feel quite as confident as the recording made at 132 beats-per-minute. Overall, however, the band adheres to the tempo fairly well. There are a couple of moments during which the band collectively seems inclined to slow down, but the click pulls them along. Interestingly, this seems to have occurred most often at the top of the form. This implies that the relative tension at different points within a harmonic progression will have some bearing on the rhythmic propulsion put forth by the players.

\textsuperscript{52} Michael H. Thaut, *Rhythm, Music and the Brain* (New York: Taylor & Francis Group, 2005) 42.
There is prosody between the point of the form at which the harmonic tension relaxes and where the band feels the natural inclination to play further back on the beat.

An illustration of this is provided in table 5.2 which shows the audio of the bass in relation to the grid and the isochronous click (the isochronous click is represented by the word “click” spelled properly, whereas “klique” represents the click track that is modified). Grid line 37/1 corresponds to the top of the chorus of the blues. One can see that the transients indicating the attack of the bass are behind the beat in bars thirty-seven and thirty-eight, and that the transients are moving back towards a centered placement by bar forty.

Table 5.2 Click and Bass, Bars 37-40, 216 Isochronous
Fluctuating Metronome

Based on Thaut’s estimation of a threshold of perceptibility for tempo change\textsuperscript{53}, and the author’s own experience, the expectation was that the gradual modulation programmed into the click track in the second and third choruses would escape conscious detection and guide the quartet smoothly away from the established tempo. This is indeed what occurred in the second chorus during the modulation in which the period of the beat was reduced by two percent over the course of two bars. Table 5.3, compares the bass track recorded with the isochronous click (Bass.01) with that recorded with the altered click (Bass.02). By the middle of bar fourteen, the bass recorded with the modulated click track is pulling ahead, and by bar sixteen the gap is a significant portion of the beat.

\textbf{Table 5.3 Click and Bass, Bars 11-16, 132 Non-Isochoronous}

\textsuperscript{53} Thaut, 42.
It bears mention that the grid in figure 5.3 is calibrated to the altered click track, hence it appears that the bass track recorded with the isochronous track is behind the beat. In fact, it is the grid of the session that is ahead. In the third chorus, the same modulation is applied in reverse; the period of the beat increases by two percent over two bars. It is noteworthy that although this modulation also fell below the threshold of conscious reaction, the transients betray a greater reluctance to drag than to rush at the tempo of 132 beats-per-minute. Table 5.4 demonstrates this as it shows the bass from the non-isochronous recording (Bass.02) landing further ahead of the grid line than in the previous table. Reactions to speeding up and slowing down are not necessarily symmetrical, and just as Dave Liebman opined in his interview, tendencies are not necessarily the same across the range of tempi.

Table 5.4 Click and Bass, Bars 18-23, 132 Non-Isochronous
The change inserted in the fourth and fifth choruses consisted of truncated fourth beats in the fourth bars and elongated beats in the eight bars. The magnitude of the shift was greater in the fifth chorus than in the fourth, though both were intended to be at or above the threshold of perception. The hypothesis was that the tendency to overcorrect the deviant beat period would be readily observable. This did in fact occur and is shown in table 5.5. The bass (Bass.02) is centered on the beat at grid line 41/1, immediately following the truncated beat, but is behind the beat at grid line 41/2, indicating that the bassist played a beat with a longer period in response to hearing a beat with a shorter period.

Table 5.5 Click and Bass, Bars 38-42, 132 Non-Isochronous

In this case, however, the reaction did occur symmetrically in response to the opposite modulation. The elongated period of beat four in bar forty-four elicited the
response of a shortened first beat in bar forty-five. One can also see in table 5.6 that it takes the bassist about a bar and a half to re-center. The notes have reverted to their usual placement by the middle of bar forty-six. Both the overcorrection and the period of time taken to reset are in line with the author’s expectations based on the writing of Thaut.  

Table 5.6 Click and Bass, Bars 44-50, 132 Non-Isochronous

A striking example of music imitating the physical world, providing tangible embodiment to the ideas of Steve Larson in *Musical Forces*, takes place in the sixth chorus of the non-isochronous recording in which the harmonic instruments are trading four bar phrases with the drummer. This is the section in which the modulation is most pronounced. It is the same in its metric footprint as the modulation applied to the second

54 Thaut, *Rhythm, Music and the Brain*, 42.

chorus but the magnitude of the change is ten percent of the beat as opposed to two percent, and the accelerando is blatantly obvious.

The drummer on the session responded to the sudden increase in tempo in a manner that brings to mind a skier going over a jump. Having noticed that the tempo was accelerating, he sped up to stay synchronized, but continued to speed up even after the metronome had begun to slow down to the original tempo. The result was a situation in which the beat nearly turned around as the drummer seemed unsure as to which click to gravitate to as beat one of the bar. The music feels quite uncomfortable at this point. One can observe in the ride track in table 5.7 (OH Ride 0.2) that the prominent transients in bar sixty-seven are not well oriented to the grid, especially in beat four of the bar.

**Table 5.7 Click and Ride, Bars 67-69, 132 Non-Isochronous**

![Table Image]

Although the simulation undertaken here is exaggerated to some degree, this is a phenomenon that is often observed while coaching student ensembles; one student’s
rushing tendency will amplify that of another’s to a degree that escalates the discomfort of the situation. This underscores the value of teaching students to understand their own tendencies in reaction such that they can become lucid and respond smoothly in challenging performance situations, in the classroom and beyond.

The final chorus of the non-isochronous performance reinforced the observation that the riposte to rushing and dragging cannot be assumed to be symmetrical. In bars seventy-three through eighty-four, the quartet was more inclined to follow the aberrant click into rushing and resist the click when it was dragging.

The opposite tendency was exhibited at the tempo of 216 beats-per-minute, however, once again lending credence to Liebman’s assertion that inclinations will vary across tempi. Whereas at 132 bpm, the quarter was easily persuaded to rush but resisted dragging, at 216 bpm they were loath to rush but prone to follow the click in dragging. In table 5.8, which shows the altered click and the bass in the second chorus during which the click is speeding up by a factor of two percent, the bassist can be seen to be holding back against the rushing, as if unconsciously inviting the rest of the quartet to return to the original tempo. This is, of course, apropos of the bassist’s role in the ensemble and likely even the product of a bassist’s training.

The rushing programmed into the click track only takes place for two bars, hence the bassist did not need to hold out against the modulation for long. This too is a valid simulation of real life playing situations as often a player who is speeding up or slowing down is only doing so out of distraction and will recommit to the original tempo when attention is returned to the time. The fact that the modulation in this study was of brief enough duration that the bassist was able to weather the storm, so to speak, does
engender the idea of employing longer and more gradual modulations in future experiments.

Table 5.8 Click and Bass, Bars 15-18, 216 Non-Isochronous

Throughout the performance at 216 beats-per-minute with the non-isochronous click, there are moments during which the click is not fluctuating, in fact it is in sync with the underlying original tempo, but it feels as though the click is rushing because the quartet is playing so far behind the beat. Since the quartet is already prone to slow down at this tempo, the temptation to gravitate to a slower tempo seems to exert subtle pressure immediately following the modulations in which the tempo dips.

Table 5.9 illustrates a situation in which the bassist and drummer appear to be more oriented to the synchronicity between the themselves than to adherence to the click. This is significant as it describes the potential for certain players within an ensemble to
sustain their relationship to each other, and to the original tempo, in spite of another element of the ensemble drifting.

Table 5.9 High Hat and Bass, Bars 52-53, 216 Non-Isochronous

Bar forty-nine correlates to the first bar of the fifth chorus and in bar fifty-three, the fourth beat is truncated by a dramatic fifteen percent. Bar fifty-seven in elongated by the same amount, returning the altered click to synchronicity with the underlying grid of the original session. Therefore, the altered click is isochronous in bars fifty-four through the first three beats of bar fifty-seven, but it is out of phase with underlying tempo. The bassist and drummer in this example are essentially playing out of phase with click, but in tempo, and remaining in phase with original tempo. Whether this was a factor of their intention, or if they simply were too engrossed in playing to hear and respond to the click, is a matter of speculation.
Notice that the bass (Bass.02) and high hat overhead (OH Hihat2) continue to correlate nicely in bar fifty-three, both of them behind the grid lines. If anything, the bass transients in the non-isochronous track are slightly behind the transients from the isochronous bass track, revealing a predictable slight over correction, but one that stayed closer to the drummer and the original tempo than to the drifting click track. Thus it is arguably a desirable overcorrection.

Figure 5.10 shows that the ski-ramp tendency exhibited at the tempo of 132 bpm was evident at 216 bpm. This image also contains the tempo map automatically generated in Protools by the process of aligning the grid to the transients in the altered click track. The transients in the non-isochronous ride cymbal track (OH Ride.02) report that in bar sixty-six the drummer was still speeding up in reaction to the unexpected accelerando in measure sixty-one and sixty-two, in spite of the fact that the click track was already settling back towards the original tempo by bar sixty-six.

Table 5.10 Click and Ride, Bars 61-67, 216 Non-Isochronous
Broadly speaking, the performance at 216 beats-per-minute was the most malleable of all of the performances. The aberrations from a steady pulse seem to have put the players in a state that was alert and responsive, if slightly uncertain. By the end of fourth or fifth chorus they were most likely aware that inconsistencies were occurring and had begun to operate from a place of hyper-vigilance. Unfortunately, this study suffers from something akin to Heisenberg’s uncertainly principle; the act of measuring has some bearing on the results.

**No Metronome**

Performances of the piece were recorded at 132 bpm and 216 bpm without a click track. Both performances were counted off at the original tempo, however, which yielded findings about the proclivities of the quartet that pertain to the information gleaned from the recordings made with the altered click.

**Table 5.11 Click, Snare and Bass, Bars 11-14, 132 No Metronome**

![Table 5.11 Click, Snare and Bass, Bars 11-14, 132 No Metronome](image)
In the recording made at 132 beats-per-minute without a click, the quartet is ahead of the grid by one full beat by bar grid line 12/4. In other words, beat one of their second chorus of the twelve-bar blues corresponds to the fourth beat of the last bar of the first chorus in the isochronous track. This is displayed in table 5.11, the bass transient that lies marginally ahead of grid line 12/4 is the downbeat of the second chorus from the perspective of the quartet that is tracking with no click. Similarly, the quartet is a full bar ahead at grid line 32/1. The ninth bar of the third chorus should arrive at bar thirty-three, but rather arrives at bar thirty-two.

Table 5.12 Snare and High Hat, Bars 36-40, 216 No Metronome

The same phenomenon occurred in the recording at 216 beats-per-minute, but inversely, and coincidentally by nearly identical proportions. The second chorus started one beat late, which is to say that beat one of bar thirteen in the track without a click corresponds to beat two of bar thirteen in the isochronous track. The two takes of the
piece are out of phase by a full bar at the top of the third chorus. The downbeat of the chorus in which the piano solo begins should fall on grid line 37/1, but instead falls on grid line 38/1 of the session. The drummer marks the top of the chorus by anticipating the downbeat on the “and of four” in all three takes. The placement of the drum fill is identical in the first and second takes, and can be identified by its similar transient footprint in the third take, but the “and of four” in the non-metronomic take, rather than preceding grid line 37/1, is nearer 38/1, falling slightly after. This is clearly visible in table 5.12 in which the transients from the overhead microphone for the high hat side of the drum set are displayed.

The fact that the quartet sped up from 132 beats-per-minute and slowed down from 216 beats-per-minute correlates with, and even lends explanation to, the tendency of the players to go with the modulating click smoothly at times and resist it to some degree at others. One could infer that when the click sped up by two percent in the second take, the quartet embraced that movement because it was drawing them towards a more comfortable tempo. They did not conform as easily to the change when the click slowed down, however, ostensibly because this was moving away from comfortable tempo.

Again, the inverse is true about the medium-up tempo of 216 beats-per-minute. The quartet was prone to concede to the metronome slowing down, but less willing to speed up with it. These tendencies, at both tempi, were most likely entirely unconscious, as evidenced by the post-session conversation with the players (see below).

These observations about tempi correlates to John Hart’s assertion that one of the goals of metronome work should be simply to become quite comfortable with common tempi. Drifting dramatically from the starting tempo is an indication that the student
session players could benefit from more time ear-training 132 bpm and 216 bpm. Having a firmer concept of “where to place the beat,” as Hart would say, would probably help ameliorate the drifting of the tempo and support a better feel within the quartet globally.

**Comparison**

As per all three interviews, the goal is not to play accurate metronomic swing, but rather to play swing that feels great. Upon listening to each of the three takes recorded at 132 bpm, with the click track muted, hence hearing the instrumentalists only in relationship to one another and not in reference to the click, certain generalities regarding the performances emerged. The take with the isochronous click feels like it has the most energy and the greatest sense of forward motion. However, occasionally a musical idea seems awkward or forced; as if that particular line or “comping” pattern would have wanted to push or pull a little bit but was not able to due to the click.

The take with no click felt more organic and natural. There was a sense of amiability between the players that was missing from the take with isochronous click. The players seemed more free to respond to one another’s musical ideas in a way that created a satisfying interplay within the quartet. A bit of the sense of urgency of the first take was missing, though, in the take with no click. This is not necessarily a bad thing, however, remembering Liebman’s admonition that the time should be “pliable not tense.”

Interestingly, the take without the click almost feels lazy when compared to the first take. We know from the analysis of the different takes in relation to the grid of the session that the take without the metronome actually sped up from original tempo, yet somehow it manages to convey a greater sense of relaxation. Perhaps this is because the players, consciously or unconsciously, were aware that if they tried to execute and idea
that required a modicum of flexibility in the time, their comrades would allow them that, therefore no one needed to feel in a hurry to get to next arrival point.

The take with the altered click did not feel as clumsy as the author expected. Even knowing when to listen for the changes in tempo and beat period, those below ten percent in magnitude were almost imperceptible and would most likely go completely unnoticed on a jazz record recorded by the masters. The beat truncation of fifteen percent was felt, but did not interrupt the flow of the performance to any great degree. The gradual rushing did throw the quartet into disarray, but not to such a degree that it compared to the worst one might expect to see in student ensembles trying to master a new genre or tempo.

The three takes at 216 bpm were similar in character and comparison. It was, though, easier to notice the movement in the track with the altered click. The click track was designed to speed up and slow down my percentage of beat period, and the magnitudes of the modulations in absolute time, or milliseconds, in the track recorded at 216 bpm were therefore significantly smaller than those in the track recorded at 132 bpm. It seems counterintuitive that the modulations would be felt more at the faster tempo. Again, the take recorded with no metronome felt the best.

**Observations from the Session**

It had not been the author’s intention to ask the students in the quartet about their experience. Yet a dialogue did ensue, over the students’ curiosity about the experiment. A number of compelling points emerged from the conversations that took place during and after the session.

Everyone enjoyed participating in the project. Most serious musicians think a lot about time and care about improving their time and the players were scintillated by the
opportunity to document and receive feedback on their own tendencies. They expressed that they felt that the experiment in itself was a productive way to practice.

The players in the quartet were apprised in advance of the fact that there would be changes in the isochronous flow of the metronome, but the specifics were not known. It became a bit of a game to see if they could identify the modulations before they were disclosed to them. After the session, they attempted to describe what they thought was happening. No one had been consciously aware of the two percent increase and decrease, respectively, of beat period in the second and third choruses. The guitarist mentioned that although he did not notice that the click was rushing or dragging, that it just “felt like it was harder to play.”

The bassist, who had the simplest rhythmic role in the quartet, came the closest to being able to describe the five, ten and fifteen percent modulations and their locations. He was able to recall that he felt the time jump forward and later fall back during the piano solo in the fourth and fifth choruses; a detail which none of the other players were able to describe with such specificity, although all of the players acknowledged that something was taking place during the piano solo. Everyone was well aware of the more dramatic rushing and dragging that took place in the final two choruses during the drum trading.

In summary, the results of the exercise aligned well with the authors expectations. The quartet followed a shallow, gradual modulation of tempo without noticing it was happening. Beats that were shortened or lengthened dramatically enough to be consciously perceived were overcorrected and the time was resynchronized over the period of a bar or two. Dramatic rushing and dragging required the quartet to follow as
opposed to resist, but caused a general disarray within the timing of the quartet and an interruption of musical ideas and improvisatory flow. The asymmetry of responses to rushing and dragging, at each of the two tempi, was a facet of the outcome of the session that the author did not predict. It does stand to reason, however, considering that the group was prone to rush from 132 bpm and to drag from 216 bpm, as evidenced by the takes recorded without click tracks.
Chapter 6

DRAWING CONNECTIONS

Certain phenomena, related to playing swing time with other people, emerge simultaneously from the interviews, the recordings, the metronome study and the literature reviewed. In establishing the need for a modern pedagogy that teaches the subtle facets of timing between individuals, it is instructive to draw connections between the methods of research employed to establish those commonalities. Although the manner in which the different lines of inquiry arrive at their conclusions may be disparate, ultimately the knowledge of experienced players, the treatises both philosophical and scientific, and the observations from the metronome study all point to some universal commonalities. Performers, educators and students who expand their ear-training and awareness to the refined aspects of swing timing will benefit considerably in their practice techniques, playing and teaching.

The scenarios used to illustrate the concepts in this chapter are culled from the author’s professional experience as a performer and educator, as well as the author’s experiences as a student. Some of the situations described pertain to players who lack experience. The author acknowledges that circumstances in which major timing problems are an impediment to making great music occur less and less as one gains experience and finds oneself in the company of ever more competent players. To players at a high level of expertise, such considerations as how to place the beat and achieving a consistent tempo do not require a great deal of thought or discussion as they have become second nature.
For those who have not established these basic and crucial skills, however, and for those who are charged with the task of coaching inexperienced players in the development of these qualifications, a thorough delving into some of the complexities that belie the challenges of achieving great swing in ensembles is consequential. Jazz educators at elite institutions will have the privilege of teaching students who are the cream of the crop and have already worked quite a lot on their time and do not struggle with it. The vast majority of jazz educators, though, will be working with high school students or college students who need guidance in these areas. Additionally, even as one’s career as a performer advances, fate sometimes shuffles the cards in such a way that one ends up in a performance setting in which one or more players are struggling with timing issues. Being equipped with the best strategies as to how to respond could make for the salvation of such a situation.

It could be argued that some of the ideas discussed constitute an over-thinking of timing, which should be visceral and intuitive. The author would counter that we study scales and harmony exhaustively so that our command of them becomes instantaneous and effortless. What at first demands a great deal of cognitive strain eventually becomes automatic. Likewise, investing generously in a deeper understanding of time, and the interconnected experience of it with other players, leads to the sort of natural and organic time feel to which all musicians aspire. The following insights are intended to offer some assistance to anyone engaged in the task of trying to improve their time awareness in ensemble settings and especially to those who are trying to aid others in their growth process.
**Period Versus Phase**

A crucial conceptual foundation for the discussion of time at this level of detail is the idea of period versus phase. At any given tempo marking, an isochronous pulse has a period, which is the precise amount of time between the onset of one pulse and the onset of the next. A coarse outlook on this periodicity would regard the beat as a point, and a series of beats as equally spaced points. A more nuanced perspective, to put it in the words of Dave Liebman, respects the beat as an area, not merely as a point.

The weight of that simple statement is staggering. A universe of complexity is opened with the expansion of the beat to include its entire periodicity. Now the concept of phase has been introduced into the equation. In a context in which a metronome is used as an anchor, one can choose to relate to the metronome as the center of the beat, giving clarity to what regions of the area of the beat would be considered in front of or behind the center.

In a context without an isochronous metronome, however, the players have only each other by which to measure their placement within the area of the beat. If the subjective notions align as to where each player is placing the time relative to the center of the beat, the time will likely feel good, and if the time feels good, the music will likely sound good. If the subjective notions of placement are not aligning well, though, and one person’s front of the beat is another person’s back or center, the center of the beat will be hard to feel and the timing of the performance will not coalesce. It will be imperative that the players in the ensemble identify the problem and make the necessary adjustments.

Dave Liebman describes a desirable phase relationship within the realm of the beat as “agreeing to disagree.” In order to create dimension in the feel by placing the beat
tastefully out of phase with another element of the ensemble, a musician must learn to hear sounds that occur off center from the beat as out of phase, as opposed to representing a change in the period of the beat.

This is an aspect of ear training that is generally under emphasized, as it presents special adversities. According to some studies, it is inherent to our nature to hear sounds that are not isochronous as changes in period as opposed to changes in phase. A study by Michael Thaut in which participants were assigned to tap on the off beat from a click track measured the reactions to random changes of two percent magnitude in the period of the beat. In five times out of six, the participants would react by trying to correct their period. In other words, they attempted to adjust the tempo to the new period as opposed to perceiving the sound to be ahead or behind the center of the beat in the original tempo. Furthermore, this tendency is thought to be subliminal.

Therefore, the musician who wishes to have great command over their time needs to invest in ear-training the different areas of the beat just as they would ear-train the different landing points within the bar. In so doing, they can develop the capacity to override their innate tendency to change period and rather sustain a consistent period with a heightened awareness of phase. It stands to reason that the more accurate one’s internal clock is, the easier it will be to achieve this sort of hearing. Herein lies the value of the metronome work espoused by all three interviewees and recommended in many method books.

---


57 Ibid.
Complicating the existing challenge of hearing musical sounds as placed in front of or behind the beat, as opposed to centered but in a different period, is the fact that the period does in fact shift slightly at times, and in fact at times even dramatically, as in the live version of “Four” on Miles Davis’ “Four and More.” The professionals interviewed were in unanimous concurrence that swing is not metronomic. Thus it can be difficult to discern if a fellow performer is trying to play ahead of the center of the beat or if they are actually perceiving the music at a faster tempo. Should one be pliable and adjust to the faster tempo? Or would that be depriving the other player of the freedom to play on top of the beat? Such questions underscore the need for a pedagogy that both includes and transcends rigorous metronome work.

Take, for example, the drummer who places the backbeat behind the beat, attempting to achieve the desirable bouncing effect that Sonny Payne and Norman Keenan created in the iteration of “Fly Me to the Moon” discussed in Chapter Four. Other players in the ensemble might unfortunately perceive the late snare as a longer period as opposed to a slightly out of phase back beat. More often than not, this happens because the drummer is overdoing it; evincing an immature execution of a mature concept. The outcome is dragging. The other players will begin to play as if the period of the beat were longer, as if the piece were being played at a slower tempo. The drummer will likely continue to play the back beat behind relative to the other players, even though

---


they have slowed down, and a feedback effect ensues that can quickly result in the tempo dropping several beats-per-minute. This results in a sense of languidness and sloth.

Of course, this same phenomenon could occur in reverse; one player places the beat slightly ahead, resulting in other players perceiving a shorter period, causing the music to rush. Also, it needn’t necessarily be rhythm section players that display such tendencies. All players in the ensemble are responsible for the time. In any such scenario, what is occurring is a failure to “agree to disagree.” This raises the question of how to find a balance between being responsive and being assertive. Being too responsive may deprive another player of the freedom of relative placement. These considerations will be further addressed in the section on mentality and attitude.

In as much as the relationship between period and phase can be confounding to the inexperienced, the selfsame principles are astonishingly powerful when applied well by those who have gained command of them. Masterful recordings like “Fly Me to the Moon,” The Jazz Messengers’ “One by One” and John Coltrane’s “Tunji” demonstrate how good the music can feel when the trust exists between the players to create a mutually supportive web of beat placements. Tempos, while not necessarily strictly metronomic, are steady and energetic and sustain a sense of forward motion. Ensembles begin to function as a single organism. The feel of the music may take on characteristics resembling various forms of physical motion. Listeners will feel compelled to entrain to

---

the music by moving their bodies. Outstanding prowess with period and phase is imperative in imbuing the music with these qualities.

The skill required to be able to apply these concepts often takes years or even decades to develop. It is the author’s conjecture, based on many years as both a student and educator in the collegiate music context, that the skill in question is essentially a component of ear-training and could be acquired much faster if properly taught. Unfortunately, the inherent difficulty of expressing such a remarkably deep and nuanced topic in common language deters many educators from tackling these issues at all. Those educators who do attempt to counsel students on the more sophisticated aspects of timing often fail to do so constructively for lack of linguistic tools. Far too often, students are admonished for the inadequacies of their time without accompanying suggestions of practical actions to be taken. The tenacious amongst them will persist and solve these problems through their own ingenuity and through countless hours on the bandstand, absorbing the proper timing by osmosis. As Dave Liebman points out, one develops great timing through playing with those who have it. Nonetheless, the modern jazz educator should be equipped with a vernacular, supported by a robust conceptual understanding, that will allow them to expedite their students’ progress in these vital areas.

**Thresholds- Conscious and Unconscious Responses**

Another basic principle that affects our musical timing in ensembles is thresholds. The first significant threshold is the threshold of conscious perception of change in tempo or beat period. Michael Thaut considers this threshold to be around five percent.\(^{61}\) This threshold may be significantly smaller for experienced musicians; the ear (or rather the

---

\(^{61}\) Thaut, 42.
brain) can be trained to observe more refined differences. Nonetheless, the threshold exists at some level and beneath that threshold our best conscious efforts at playing consistent time are not applicable.

Related to the threshold of conscious perception of change is the fact that there is a shorter response time to auditory stimulus in the sensorimotor regions of the brain than there are in the prefrontal cortex where the decision making process occurs. In other words, unconscious physical responses to things one hears precede well-conceived reactions. The author considers it extremely important that musicians should be aware of this quality of their neurology. The implication for musicians is that if a change of a small magnitude is occurring gradually enough, it will likely go unnoticed. Biologically speaking, one is prone to succumb before the opportunity to consider how to react even presents itself. Should the tempo continue to move, albeit slow and steady, in the same direction, eventually awareness kicks in.

Consider the guitarist in the metronome exercise in Chapter Five whose guitar solo took place over the modulation of two percent of the beat period, positively and negatively in the second and third choruses of the performance, respectively. The modulation in the tempo escaped conscious detection by any of the members of the quartet. Yet the guitarist reported that it felt “harder to play.” This scenario, though artificially generated in the exercise, is fairly common in real-life ensemble playing; the tempo is not rushing or dragging in a dramatic manner, but is moving enough to cause a sense of unease or unsettledness in the music. It simply seems hard to play.

This again underscores the value of personal metronome work, and as John Hart would advise, becoming deeply familiar with common tempi. Tempo is, in a sense a
macrocosm of pitch, and therefore equally subject to the necessity of ear-training.

Understanding that timing at the most minute levels is in fact somewhat subliminal, the less inadvertent variation each individual is introducing into the collective web of beat placement, the easier it will be to play and create a desirable feel in the ensemble as a whole.

Above the threshold of conscious perception is an area in which the musician has the power not only to react, but also to respond. Changes to the tempo that are of great enough magnitude to be immediately noticed fall into this category, as do changes that are gradual enough to escape immediate detection but persistent enough to be noticed after several bars. Within the realm of conscious perception, other thresholds can exist, and deliberate control over their details can be practiced. These thresholds pertain to how a musician might choose to respond to variations they are hearing in the tempo.

An audio compressor provides an apt metaphor for this phenomenon. An audio compressor will have a threshold that determines at what decibel level the compressor will begin to affect the audio signal. Other controls, the ratio, attack and decay settings to be specific, set how the compressor will react when the threshold is crossed. The ratio describes how dramatically a sound will be attenuated when its amplitude crosses the threshold. The attack affects how quickly the compression is applied and the release sets how long the compression continues to affect the sound.

These principles can be applied to how a musician can respond when someone is rushing or dragging. For example, one could say that if someone were to play on top of the beat for a few bars in such a way that it caused the tempo to speed up a little bit that that is okay, it is allowable until it crosses a certain threshold. For the sake of
nomenclature, let us refer to this as a threshold of acceptable variation. At this point other players in the ensemble would need to respond by asserting the original tempo.

The function of the threshold can be reversed; which is to say that if one player, for example the soloist, is moving around and being loose with the time, within a certain limited range the rhythm section may choose to assert the original tempo. Yet if the soloist should speed up or slow down to a degree that crosses a threshold (in this case, it could be called the threshold of comfort), the rhythm section would need to follow such that the music would not feel awkward. Recall Dave Liebman’s adroit description of great swing being “pliable, not tense.”

The compressor metaphor can be extended further. An example from a classroom setting will be used to illustrate. A young and talented drummer who is excitable in his enthusiasm has a tendency to speed up intended tempi. A more experienced student occupies the bass chair. The drummer rushes badly enough to gain six beats-per-minute over a chorus of the blues at a challenging tempo, but the bassist would only allow him to accelerate three beats-per-minute. The bassist is “agreeing to disagree” and the music is pliable but not tense. To describe this in compressor terms, the bassist had the maturity to set a gentle ratio of two to one. A ratio of infinity to one would likely have felt uncomfortable, as would a six beat-per-minute increase. It is in line with the over-arching purpose of this essay to point out that if the bassist had lacked the maturity to be “pliable, not tense,” and had become frustrated with the drummer, one would hope the educator would be able to impart both helpful suggestions to the drummer for stabilizing his time and helpful suggestions to the bass player for dealing with it.
Expanding the metaphor to include attack and release times, the attack time, which describes the onset of the compressor’s function, can be compared to the amount of time it takes a player to respond to anomalies in another player’s time. As mentioned above, this may at times be subliminal and beyond conscious control. At other times, however, one might notice that something is occurring with another player’s time and wait a certain number of beats or bars to gently correct for it as seamlessly as possible.

The release time of a compressor could be likened to the way in which an experienced player will at times reabsorb a deviation in the timing over the course of a bar or two or even more. Thaut’s research suggests that this is an inherent human tendency in correcting when synchronizing to an isochronous pulse, and it is a device that skilled players employ both consciously and unconsciously.

Table 6.1 Click and Bass, Bars 44-50, 132 Non-Isochronous
The metronome study described in Chapter Two and Chapter Five sought to capture of examples of this phenomenon. Table 6.1 (the same as Table 5.6) provides a visual illustration of the bass player re-centering the beat gradually and smoothly, such that an uncomfortable lurching is not required to resynchronize with the underlying pulse. Group metronome practice is especially useful for gaining conscious control over this phenomenon. The author once worked with a drummer who would wear a click that only he could hear at rehearsals so that if the ensemble sped up or slowed down, he could practice steering them back to the tempo over different intervals; for example, two, four or eight bars.

Having established the concept of thresholds, it is worth noting that multiple thresholds may exist in layers. For instance, if the time moves imperceptibly, one may react subliminally but may not respond consciously. If the time change is perceivable, however, one may find a need to become malleable and adjust accordingly. Beyond that, the tempo may move so much that one feels the urge to assert what one feels is the correct tempo. Surpassing that, there exists a threshold at which one must go with the drifting tempo or the music will suffer. Hopefully it does not get to that point, but anyone who has coached ensembles in the early stages of learning to play jazz has witnessed it.

The thresholds described above generally exist as unconscious tendencies but become conscious, and useful, through awareness. When one becomes accustomed to thinking along these lines, one begins to notice the way other players are responding to another. This is both highly amusing and empowering. The player who is keenly alert to not only how the other players are treating the time, but also how the other players are responding to each other’s treatment of the time, can act as an ambassador and make the
whole ensemble sound more coherent and unified. Having arrived at such a place of
cognizance, one should ultimately do exactly as John Hart says and “play with a degree
of rhythmic assurance that makes it impossible for other band members to not groove
with you.”

**Elasticity and Larson’s Physical Forces**

Steve Larson, in his book Musical Forces, puts forward the idea that such analogs
between the intangible aural world of music and our tactile physical reality are
fundamental to our relationship to music. In his opening chapter he writes:

….our experience of physical motion shapes our experience of musical
motion in specific and quantifiable ways- so that we not only speak about
music as if it were shaped by musical analogs of physical gravity,
magnetism, and inertia, but we actually also experience it in terms of
“musical forces.”

Over the course of the book, Larson proceeds to establish connections between tonality
and gravity, tendency tones and magnetism, inertia and musical patterns and other astute
allegorical equations. Larson’s treatment of rhythm is insightful as well. It focuses on
points of tension and resolution within the bar and in the meter. Placement within the
area of the beat, however, is not explored. Larson’s subject matter is predominately made
up of “common practice period” music; Bach through Brahms, in his own words,
touching only lightly on jazz and contemporary popular music.

Music that swings, however, and other types of music that “groove,” are perfectly
suited for consideration through the lens of Larson’s strikingly apt metaphor. When we

---


63 Ibid., 82-110.

64 Ibid., 136-179.
speak of swing music, the very name of the genre invokes physics. An object swings when it is tethered at one end and the trajectory of its fall is altered by the limitations of its tether, redirecting its inertia until it is overcome by gravity and “swings” back the other way, following a similar trajectory in the opposite direction. Anyone who has ridden a swing set or played with a yo-yo has a deep intuitive and experiential understanding of what this feels like. Sounds, however, do not literally swing back and forth (although the compressions and rarefactions of air molecules we experience as sounds may be somewhat analogous at a microscopic level). In saying that music swings we are invoking Larson’s metaphor and calling upon our most fundamental understanding; the nature of our physical environment.

As observed in the musical examples derived from the interviews, there are manifold ways in which a piece of music can swing. So too, are there many manners in which a thing can swing in the physical world. Other terms connoting repetitive physical motion are applied to the treatment of the timing, for example popping, tipping, swaying, lilting and bouncing. There are various ways an object could bounce depending on its density, weight and composition. Even the casually athletic person is likely quite familiar with the difference responses of basketballs, soccer balls and tennis balls.

The metaphor finds practical application in establishing a unified mentality amongst the members of an ensemble. The greater the extent to which the players are sharing a common experience of the properties of the music, the more cohesive the time will be. Learning to think about music through physical imagery can not only improve one’s timing, it can help one to understand how another player is experiencing the time, and through that understanding to play in a more responsive and connected way. Jon
Damian, one of the highly influential jazz guitar educators at Berklee College of music, targets this skill in an exercise in which the students practice synchronizing with a metronome whilst visualizing familiar repetitive physical motions, such as a pendulum or a bird flapping its wings.65

Larson has other concepts that have interesting ramifications when applied to swing music. The “moving music” metaphor and the “musical landscape” metaphor represent the two main ways humans speak of (and therefore, think of) time— with the human as the stationary observer and time moving past, or with time existing as a landscape that the observer is moving through.66 In the case of the moving music metaphor, this translates to musical events coming towards us, passing us, and moving behind us into the past. In the case of the musical landscapes metaphor, the time-scape of the music is laid out before us and we move through it, discovering its landmarks as we go.

Whereas Larson introduces these paradigms as modes of listening, it is compelling to consider them from the perspective of an improvising performer. Both yield thought-provoking results. In the case of the moving music metaphor, the observer can stand, grounded in the present, creating sounds in response to the piece of music that is moving past them. They need not produce the time, or concern themselves with the rate of its passage, as it is the time that is moving past them at a steady rate. The observer is not passive necessarily, as (s)he can interact with the chord changes and forms that are


66 Larson, Musical Forces, 66-70.
moving by them, but they can relax. This can be an extremely helpful mentality to adopt, especially at bright tempi.

A contrastive outlook is offered by the musical landscape metaphor. In this vein of thought, the improviser is moving through the form of the piece, creating things within the landscape as they go. Forward motion is a pervasive notion in jazz. The music should have a sense of forward motion. This conjures an image that is subtly different from Larson’s, wherein it is the listener or observer who is moving forward, as opposed to the music. Nonetheless, the two conceptions are similar in that there is a sense of going to the next thing; it is a proactive state of being. There is an intensity of intention that can be harnessed by either creating or becoming that which is moving in time.

It is indicative of the significance of forward motion that pianist and educator Hal Galper has created a book and an entire teaching method based on and titled after forward motion. Galper touts the idea that numerous challenges in playing jazz can be resolved by shifting to a mentality of going to the next place.\(^{67}\) To Galper, beat one is not the first beat of the bar, but the last- the one we arrive at. Likewise, the tonic is not the first note of the scale but the last.\(^{68}\) An entire chorus on a standard can be an anacrusis to the the downbeat of the first bar of the form.

Extending metaphor and coming full circle to swing, it is challenging to think of anything that propels itself forward that does not rely on some sort of bilateral motion. Consider a snake that moves itself forward by pushing part of its mass side to side, or the transfer of weight from one side to another in quadruped or bipedal walking. Forward

---


\(^{68}\) Ibid., 16-17.
motion relies on a recurring dualism—strong beat and weak beat, tonic and dominant, longer eighth note and shorter eighth note—to make its way into the future. Swing is inherently a fitting avatar of forward motion.

Connecting the previous discussion of thresholds with Larson’s theory of physical forces, we find some justification for the frequency with which we hear words used to describe physical substances applied to music. Dave Liebman states that swing is not metronomic and that some elasticity is desirable. Steve Johns says that swing is not metronomic and that it should flow freely like the wind in a sail. Elastic. Canvas.

Physical substances. A metronome is like steel; it cannot be impressed upon. A player with assiduously consistent time who will allow you a short beat if it held logic within your phrase is like wood. It can be gauged into, it is not as hard as steel, but will retain its form.

The thresholds that describe the way players react to one another in regards to beat placement and tempo can be equated with the properties of physical substances. If one leans on the time with this individual, (s)he will respond with a certain amount malleability, and steer back to the original tempo over a certain amount of time, like a foam cushion that collapses slightly when depressed, returning to the original form after several seconds. Whereas this other individual, under the same circumstances, will adhere rigidly to the tempo, unto such point as that adherence becomes uncomfortable and will then plane to a nearby tempo the seems more comfortable and stay there, thusly exhibiting a different “physical” property.

Whether or not one chooses to embrace such extravagant metaphorical thinking, the point is that when one is highly attuned to the idiosyncrasies and mannerisms of the
other players within and ensemble, and one is aware of and in command of one’s own tendencies of reaction and response, one can choose to adopt the most appropriate timing schema (or “thresholds” or “physical properties”) for that unique situation. In the words of John Hart, drawn verbatim from the interview, “the most flexible and arguably successful players are the ones who are able to compromise and adjust their playing to suit their particular band mates.”

One cannot learn this from a metronome, nor can one even learn this from listening to records, although great insight can assuredly be gained there. Ultimately, this learning must be experiential. As Dave Liebman advises us, we get great time from those who have it. In order to receive it, however, we must show up with eager ears, humble attitudes and a sophisticated awareness of the subjective experience of our musical comrades. As educators and pedagogues, we are obliged to foster these qualities in our students every bit as much as we carry the responsibility of making sure they are practicing with their metronomes.

**Mentality, Attitude and Cooperation**

Music is, among other things, a social activity. It often involves interacting with small or large groups of other musicians and occasionally audiences as well. One’s musical timing within an ensemble is, fundamentally, an extension of one’s social skills. One can be confident, dependable, flexible, empathetic and even amiable in rhythm as much as one can be in a friendship. Above all else, one can be a great listener.

The goal is not to be correct or to be the individual in the room with the best time. Nor is the goal to receive accolades or affirmations from fellow musicians based on one’s prowess. Time is perfectly capable of being exquisitely beautiful without our help. The
best we can do is enjoy cavorting together in its incessant flow. Time offers us an infinitely complex tapestry of experience with which to exercise our minds and a template within which, through music, we can share incredibly intimate communication and interpersonal experiences. The goal is to see just how good it can feel.

Helping others to achieve this goal can, at times, require some diplomacy. When asked in the interview what one should do when someone is rushing or dragging, Steve Johns replied that they should be told, because they likely do not know and should care and want to fix the problem. The author agrees with this statement, but feels that the manner and timing of the transmission have bearing on the effectiveness of the communication and the outcome of the playing situation. Time awareness and self-consciousness are not the same thing, and in the author’s experience, being self-conscious about one’s time never makes anyone play better. That said, the unpleasant experience of feeling self-conscious about one’s time might cause one to feel motivated to take actions that will bolster both their time awareness and their time confidence, which is undoubtedly positive.

Suffice to say that when addressing issues in another player’s timing, words should be chosen judiciously for constructive merit. Criticisms should be accompanied by practical suggestions and vagary is only acceptable if a deliberate omission is intended to leave room for the recipient to have an epiphany. Criticism that is vague due to an inability to speak articulately about the enigma of time is not constructive.

In his book Time Awareness for All Musicians, drummer Peter Erskine provides an astute and somewhat comical illustration of a player’s descent into a level of self-
consciousness that strips attention away from what really matters, the music! The admonition is to not get distracted auditing other players’ time, focus on your own. That said, one can be cognizant of other players’ timing without judging it, and in fact that awareness is commensurate with focusing on the music. Ultimately, Erskine incites us to own the time and to practice with a metronome. Build a strong foundation, from there one can be both assertive and responsive- both of which are excellent ways to help everyone feel comfortable and play their best.

**The Sonic Environment and Other Factors**

A thorough examination of the interrelationship of dynamics and timbre with timing is beyond the scope of this writing, as the topic could easily constitute an entire doctoral essay unto itself. Nonetheless, it would be neglectful not to mention the huge bearing relative volume levels within an ensemble will effect the way the players experience the time. If the aim is to create a refined web of complimentary placements of the beat, the players need to be able to hear one another in relatively equal proportions. If one sonic element in an ensemble is dominating and obscuring another, the intended placement of another element may lose its counterbalancing component, causing the delicate balance of the timing to be thrown off. Performers and educators alike are well served to be able to identify such obstacles and regulate.

Players who use amplification need to be especially aware of this. Sometimes equalization is the cure as opposed to simply gain. This is a facet of the musicianship of electric guitarists, bassists and keyboardists that is often neglected in the classroom. Improper balance between parts of the drum set can also cause problems. It is imperative

---

that teachers tackle these issues when trying to help ensembles achieve better timing, because nothing enables a comfortable “pocket” like a lucid mix.

Furthermore, certain instruments, notably the upright bass, have an envelope of attack that can create confusion as to the intended placement of the beat. The envelope of the bass has a slower attack than most instruments, arriving at peak amplitude with enough of a delay in milliseconds to create a phase difference between when the string is plucked and when the note blossoms. Experienced bassists know that the other members of the ensemble will likely experience the onset of their note a slight bit later and play minutely ahead of their intended placement to compensate.

Acoustical phenomena can complicate things as well, and knowing how to position instruments within a space, whether it be a performance space or a rehearsal space, can help in creating the best environment for great swing to played in. As a long time student of John Hart, the author knows that class does not start until the instruments and amplifiers are properly positioned for the players to be able to hear each other well and interact visually. Such practices set apart the paragon educator from the merely adequate.
Chapter 7
SUMMARY

Conclusions

A universe of complexity exists in the way musicians interact in timing through swing music. It is a topic deserving of rigorous cogitation through philosophical, scientific, experiential and practical approaches. The metronome is an indispensable tool for developing accuracy, consistency and familiarity with tempi. Another environment exists however, which is vast and far from wholly charted, when the metronome is turned off. Even the seasoned performer will enjoy and benefit from exploring this illimitable terrain through engaging in dialogue with fellow professionals, reading contemporary literature on the subject and developing and participating in fresh and innovative practicing strategies. The insights gained will enliven listening as well as performance; a boon which itself is rewarding.

As educators, we owe it to our students to actuate, as early on as possible, their awareness of the beautifully complex web of interconnected subjectivities that exist when a group of musicians plays together. As timing can infinitely be refined, it is an aspect of one’s musicianship that is a lifetime pursuit. Equipped with the proper conceptual foundation and supporting linguistic tools, the educator can accelerate a student’s acquisition of mature timing in swing music and foster that student’s ability to interact well in ensembles. In much the same way that copious amounts of energy are dedicated to the study of scales and harmony such that players end up with instantaneous effortless
command of these facets of music, a phase of deep inquiry into the subtleties and nuances of timing in group settings yields a musician to whom timing comes easily.

Music theory, as we call it, is not a “theory” in the conventional sense of the word, but a language that is used to speak about music, empowering our understanding through expression. Essentially, teaching about the finer qualities of swing timing is taking the verbal power of music theory and zooming in on the area of time called the beat. If we wish to cultivate complete musicianship, we must apply ourselves from the micro to the macro holistically.

Through the examination of cutting edge philosophical, scientific and methodological writing, through the experience of seasoned veterans of jazz music and through a curious and innovative timing exercise, this writing has shown that the interconnected subjectivities between players in swing music give rise to a profoundly complex temporal landscape. Working on one’s personal time is not the end of the process; it is merely a prerequisite to developing mature collective time. Pedagogy for the teaching of swing time has only begun to scratch the surface this immense subject, hence there stands a need for a cogent, eloquent, interdisciplinary approach to helping students, teachers and performers alike deepen their understanding in these crucial areas.

**Implications for Teachers**

Time is the feature of an individual’s musicianship that is most often criticized without inclusion of salient advice on how to ameliorate the targeted problems. The effective teacher should be capable of expressing the issue in a number of different manners, as each student’s mode of reception will be unique. Furthermore, the teacher should be prepared to furnish the student with an array of activities that support both their
conceptual understanding of the issue and their improved execution. It is not enough to
tell a student who is struggling with time to practice with a metronome or to listen to the
masters, they deserve to be shown how, and enlightened as to why to practice with a
metronome, and guided in listening to the masters as to what they are listening for.
Through this manner of involvement, a mentor will more assuredly be a catalyst for a
student’s growth. Guidance and fellowship in the process exceeds merely reference to the
process.

The basic tenet of this paper is that there exists a need for a comprehensive
pedagogy for teaching “collective time.” Due to the far-reaching nature of the topic, it is
within the scope of this paper to propose that methodology, but far beyond the scope of
this writing to compose said methodology; indeed, the task of composing it should belong
to many minds and many fine bodies of writing. That being said, such that any performer,
student or educator who has taken the time to read this document in its entirety might be
able to take away a fresh activity or two, some ideas for the practice room and for the
class room are outlined below.

Metronome practice is indispensable and has long been a given in the study of
music since its invention over two centuries ago. Creative uses of the metronome, which
is to say various interpretations of the metronome’s orientation within the beat and the
bar, can yield greater levels of challenge and thus enhance learning. Modern metronome
apps are now revolutionizing the possibilities of metronome practice.

It is common to practice swing in four-four time with the metronome at half-
tempo, with the metronome’s click aligning to beats two and four of the bar, acting as the
drummer’s high hat. As Dave Liebman suggests, it is also incredibly valuable to practice
with the metronome at one quarter tempo, sounding once per bar, and corresponding to each of the possible landing points within the eighth-note grid. For swing at slow and medium tempi, at which the eighth-note triplet still holds primacy in subdivision, it is useful to practice with the metronome set to the actual tempo but with the metronome’s click lining up with the second or third partial of the eighth-note triplet. At times it is useful to have the metronome sounding on all beats and subdivisions. The metronome could correspond to the quarter-note triplet, or the dotted quarter-note, or the dotted eighth-note. One can get creative, and in addition to nourishing one’s personal time, it can be a lot of fun. Suffice it to say that the ways in which the metronome can be applied are nearly inexhaustible.

Another approach is what is sometimes called “disappearing metronome.” There is a metronome app called Metronomerous that is available for Android OS that is particularly useful. Metronomerous has a feature with which one can easily have the metronome play for a certain number of bars and then disappear for a certain number. As the user advances, they can reduce the number of bars for which the metronome sounds and increase the number of bars during which it is silent, thusly challenging one’s self to sustain consistency for longer periods of time and allowing one to analyze what tendencies are being exhibited if the metronome does not line up when it resumes. To the best of the author’s knowledge, Metronomerous is not available for iOS, but Time Guru is available for both iOS and Android platforms and has similar functions. Equal or greater practicing utility can be achieved with a small investment of time and a sequencing program such as Logic or Ableton Live. All of the practicing strategies
mentioned above relating to landing points can, obviously, be practiced in conjunction with disappearing metronome.

Individual metronome practice helps strengthen one’s internal clock; group metronome practice builds one’s internal clock and one’s awareness of collective time. The author is a huge proponent of the use of the metronome at rehearsals, both professional and scholastic. Once, in a class session of the Funk/Fusion ensemble at the University of Miami Frost School of Music in which the ensemble’s time was not coalescing, Professor Steve Rucker very diplomatically made the following suggestion: “Let’s put the metronome on for a little bit and just see what our tendencies are.” It struck the author as profound, as no blame was allocated, no one was singled out or made to feel self-conscious, but an effective rallying-cry to collective timing awareness was made. The onus for listening, understanding and improving was handed deftly to the students in one amiable statement.

Coaching ensembles at Broward College in Davie, Florida, the author will often have the students perform a piece without a metronome, a second time with the metronome, and a third time again without. More often than not, the students do not even need to be prompted to announce their observations. Additionally, having the students play in component duos with the metronome can be quite enlightening. Having the melodic instruments play with only the drummer’s ride cymbal, with the metronome guiding the time, is a valuable classroom strategy.

Focused listening in the classroom and in private lessons is worthwhile because often students can benefit from elucidation as to what they are hearing. The opening of the ear takes place over many years, yet the experience of a great record can be enhanced
immediately in the company of a seasoned set of ears. Also, student and teacher listening sessions provide an excellent opportunity for the osmotic transfer of passion and enthusiasm for the music.

Playing along with records is highly recommended. Play-along tracks such as iReal Pro, and various play-along tracks in set keys and set tempos that are available on YouTube are useful, but they do not offer the student the same growth in the area of time as playing along with the rhythm sections of Miles Davis’ first and second quintets, for example. Students should be encouraged to practice along with records as much as, or more so, programmable computerized play-along devices. Jon Damian’s “guitar-in-drum-mode” exercise provides an excellent way for guitarists to isolate their timing in their right hand; by putting on a classic record and muting the strings of their guitar with their left hand such that they can play percussive sounds with their right, simply copying the rhythms and the placement of each player in the ensemble on the record. Analogous approaches could surely be invented for other instruments. Recall also that Dave Liebman has his students, of all instruments, play a ride cymbal with a stick along with the rhythm sections of the prototypal rhythm sections of jazz.

These are but a few of the practicing approaches envisaged by the author or inherited from his mentors. Further ideas for practice abound just in the pages of the literature reviewed in Chapter Two of this body of writing. The point is not to be exhaustive in one’s approach, but rather to do something everyday to continue to challenge one’s self, and to challenge one’s students. Steve Johns impels us to daily

---

metronome practice, highlighting the idea that engaging with time consistently is what brings forth the finest results. Regularity of practice helps to build confidence, and in the arena of collective time, confidence is contagious.

**Suggestions for Further Research**

The foremost suggestion the author has relating to further research is that interdisciplinary interest and collaboration are pivotal. Jazz educators are constantly evolving better and better hands on teaching methods in ensemble rooms across the country and around the world. Modern theoreticians are writing incredibly astute and insightful works on the subject of time in common practice period music and experimental twentieth-century music. Neuroscience is forging new dimensions of knowledge pertaining to the actual workings of the mind and the biology of sound and time. What can emerge from a cross-referencing of these doctrines is exciting beyond measure.

Yet both Jonathan Kramer, as an eminent music theoretician, and Michael Thaut, as a pioneering researcher in the field of the neural dynamics of rhythm, tell of the perplexities that confound such collaborations. Thaut writes the following on the subject of developing research methods that are applicable to music but sufficiently invariant to be considered scientific:

One of the initial questions in regard to scientific investigation of musical behavior deals with formulating study designs that have a valid relationship to the complexity of music’s nature. This is a point widely debated between musicians and researchers. Musicians often find little use for reductionist research approaches and the way musical elements are fitted into study designs and data gathering. Of course, the researcher’s reply is that the only scientific way to understand a complex phenomenon

---


such as music is by breaking it into small pieces. Both arguments have validity, but need to lead to acceptable compromises.

The arrival of the “acceptable compromises” Thaut speaks of could come in the form of musicians and educators who are possessed of the patience, diligence and intellect to engage in scientific thought, and in science practitioners who are involved in music at a high level as an avocation.

A music educator might undertake, albeit in a manner too casual to be considered scientific research, the endeavor of looking for the principles emerging from direly simplified research tasks in the more complex behavior of the ensemble in their classroom. As this hypothetical educator would not have their credibility as a neuroscientist on the line, they would stand only to win from any insights gained, even if the insights were merely intriguing and useful and not publishable. To be clear, the author is not advocating a dilution of scientific method, but rather the validity of educators on the front lines being aware of developments in scientific research and having a willingness to let that research inform their methods.

As to the author’s own metronome exercise, the formula for this study could be varied and elaborated in a myriad of ways. Greater and lesser degrees of fluctuation could be employed, and rates and durations of modulations could be increased or decreased. Iterations of the recording could be made in which one or more but not all of the participants were allowed the click track. Obviously, the sample size could be expanded from minimal to ample. Only two tempi were examined in the exercise in this project. Other tempi certainly merit attention, as each tempo has its unique characteristics and places unique demands on the player.
Another expansive area of inquiry related to musical timing is that of attention, focus and short term memory. It is surprising to the author that none of the interviewees broached the subject of concentration in their discussion of practicing swing timing. The sweeping “mindfulness’ movement, that in a sense secularizes certain practices of Buddhism and other eastern spiritual traditions, borders on the issues of focus and attention. Philosophical and music theoretic treatises on the nature and scope of the present pertain as well.

The majority of the ideas set forth in this essay are applicable, with only slight adjustments, to other styles of music that are “groove-oriented” and rely on a high degree of repetition in their rhythmic underpinning. Yet although there exist parallels between swing and other styles that “groove,” there nonetheless endure striking differences as well; therein lying other avenues of future research.

It would be the gratifying to know that the convictions, ideas and musings laid out in this document had caused another musician or scholar to experience a spark of inspiration. Hopefully the bibliography of this paper will help someone interested in the intricacies of human interaction in musical timing find abundant source material. May we ever gather, discuss, write and play in the act of sharing our thoughts on time.

**Final Thoughts**

While no one is quite sure exactly what time is, it is a surety that we experience it as one of the containers of our being. In the opening of the book *Time and the Warm Body*, author David Burrows depicts music as something we do to practice existing in time.73

---

A life is a complex and fragile standing wave in which energy is continuously being shaped from within into bone and tissue and thought. Whether on the level of making a tone out of vibrations, or on the level of making a piece of music, a single, sustained presence, out of a flow of silences, music models the way we make ourselves up as we go along out of the discontinuities of feeding and breathing, sleeping and waking, of brain-cell firings and the heartbeat, all adding up to the macro-pulsation that is a life. As listeners and performers we play with the instabilities and discontinuities of musical sound and work on them as we do on those of our own, aiming to build continuity out of flux, and the resulting presence in a local and immediate version of the presence that is the self.

As it is in music, so is it in life. When we work on our time, we strive for excellence in being—being in excellence. Swinging, one is great. Swinging collectively, we are great together.
Interview with Dave Liebman

1) **How have you personally worked on your time?**

I studied with Lennie Tristano. I practiced with the metronome on beats two and four. But most importantly, you get great time feel from people who have it. I spent a lot of time on the band stand with Elvin Jones. It’s great to play with someone who has a patent on a certain feel.

2) **How do you teach time?**

I have students play to a metronome, one click per bar, with the metronome corresponding to different landing points, i.e., one, the and of one, two, the and of two, etcetera. I also instruct students of all instruments to practice playing a ride cymbal, and to play along with great drummers.

3) **Is swing metronomic?**

The beat is an area, not a point. Some elasticity is desirable.

4) **What should one do when someone in the ensemble is rushing or dragging?**

Sometimes you have to agree to disagree, and that’s where things get really good. This can be a tacit agreement or an agreement that is discussed. Again, some elasticity is desirable. It is better to be pliable than tense. It is important to realize that tendencies are not the same across the spectrum of tempos.
5) Can you point to a few recordings that you consider to be examples of superb musical timing?

There is a version of Miles Davis playing “No Blues” live on the Steve Allen show that is available on YouTube.

Frank Sinatra, “Live at the Sands,” the whole thing, but especially “Fly Me to the Moon.”

John Coltrane, “Tunji.”

“Four” on Miles Davis’ *Four and More* is a good example of rushing at its best.

Interview with Steve Johns

1) How have you personally worked on your time?

I worked a lot with the metronome. I find slower tempos to be the hardest to gain control of so I would practice slow quarter note tempos. Also I would subdivide the time using triplets, quarter note triplets, sixteenth notes etc. I think daily practice with a metronome really helps to regulate your sense of tempo but it doesn’t do it all. I find that good [players’] time rises and falls during the course of a seven to eight-minute tune or longer.

It’s really where you end up, like a journey to a destination or a long walk, its got to be natural. Awareness is really the key to time just like intonation; you have to be aware if you are sharp or flat, rushing or dragging.

2) How do you teach time?

On the drum set I use many different books that work on areas of coordination. The metronome is used while practicing with the patterns and permutations. The materials in
these books vary in difficulty and you have to think about where the quarter note is all [of the] time. Then you practice without the metronome.

3) Is swing metronomic?
Swing is certainly not metronomic. It should breathe and flow naturally like the wind in a sail.

4) What should one do when someone in the ensemble is rushing or dragging?
Tell them that they are doing so, usually [they are] not aware. If they care they will hopefully make the adjustment.

5) Can you point to a few recordings that you consider to be examples of superb musical timing?
Anything by the Count Basie Orchestra. For example, the Basie/Sinatra recording, this always feels so good.
Anything by Art Blakey and The Jazz Messengers.
Chick Corea’s Friends recording is full of great feels and Steve Gadd’s timing is remarkable.

Interview with John Hart

1) How have you personally worked on your time?
I have used a metronome fairly consistently using half notes on 2 and 4 throughout my career. This not only helps to develop accuracy and consistency but also teaches you to
recognize tempos and the nuances of playing music at different metronome markings. Playing with precise time and playing with a good feel or groove are not necessarily the same. I have spent a lot of time listening to and emulating the masters on records. This has not only given me role models to work from but has developed my ear to hear how to phrase rhythmically.

2) **How do you teach time?**

I would use the techniques described in question [number one].

3) **Is swing metronomic?**

No. It is interesting however to observe that in working with students if the tempo is accurate the groove and feel are much better. A group that is rushing or dragging will sound much better once a metronome click is introduced.

4) **What should one do when someone in the ensemble is rushing or dragging?**

As you develop your own personal musical clock you also develop confidence in recognizing tempos and knowing where to place the beat. The idea is to play with a degree of rhythmic assurance that makes it impossible for other band members to not groove with you. Of course we’re dealing with the laws of physics and if you are playing guitar and the bass player and drummer are both dragging you are out numbered physically and sonically. It’s a very common predicament for musicians who have accurate time to feel the beat in a different place. The most flexible and
arguably successful players are the ones who are able to compromise and adjust their playing to suit their particular band mates.

5) Can you point to a few recordings that you consider to be examples of superb musical timing?

There are too many examples for me to pinpoint specific recordings. I will say [that] you will find very few if any examples of the masters that don’t swing. Rhythm was essential to the music and perhaps the first priority for the giants on any instrument.

The song "Freddie the Freeloader" from Miles Davis’ Kind of Blue is a great example of beautifully swinging time feels with [four] different ideas about beat placement. The first solo by Wynton Kelly is just classic piano trio groove. The notes are great but you get the impression that his main goal is to make the trio swing. Miles comes next and plays right in the middle of the beat. Relaxed and directing the rhythm section exactly how to play. Coltrane’s solo is massive, lyrical, harmonically complex, and the rhythmic feel is looser and has a tendency to sit behind the beat. Then it’s Cannonball and the music becomes ebullient, bouncy, joyous, and rides on top of the beat. Four geniuses with distinctly different musical outlooks who gel to create a whole greater than the sum.

It’s interesting to contrast Mile's playing on this to his playing from later quintets with Tony Williams and later Jack Dejohnette on drums. He remains centered as the rhythm sections create glorious chaos around him. Miles challenges the band rhythmically. He is
edgy, creative, full of risk taking, but that concept of feeling the time right in the center of the beat is still abundantly clear.
BIBLIOGRAPHY


