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A Description Of The Musical Concepts Artist-Level Jazz Musicians Employ While Improvising

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A DESCRIPTION OF THE MUSICAL CONCEPTS ARTIST-LEVEL JAZZ MUSICIANS EMPLOY WHILE IMPROVISING

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ABSTRACT

The purpose of this study is to analyze musical concepts employed by artist-level jazz performers (professional jazz musicians) playing an improvised solo. These concepts are then compared to the participant's pedagogical background in improvisation. Subjects were video recorded performing an improvised solo with an accompaniment track of "Take the 'A' Train". They then participated in an observational research method referred to as stimulated recall where each performer watched the video directly following the performance and attempted to classify the musical concepts they used in their improvised solo. Categories of musical concepts included: scales/modes, chords/arpeggios, memorized licks, melodic variation, rhythmic variation, range/intensity, sequence, and other. Participants classified these categories in two ways. They first recorded their data by making selections using a computer program called SCRIBE. Video recordings were then made of each performer's comments while listening to the improvised recording. Following the exercise each participant filled out a survey indicating pedagogical background and performance experiences. Results suggest that improvisers most often use a variety of preconceived musical ideas (memorized licks, sequence, phrasing), however, much of the musical content is also derived through knowledge and application of music theory (scale/chord relationships), especially as it relates to jazz. Several participants referred to this in terms of a language in which they have become fluent. All but one participant cited improvisation classes and/or lessons as the introduction to this musical language.

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CHAPTER I

INTRODUCTION

Jazz developed for decades as an exclusively American musical genre. Its reputation for moral turpitude however kept it out of the school music curriculum for many years. Since its inception many music educators have bemoaned the inclusion of jazz in music education. In 1934 an early publication called *The School Musician* asked for comments regarding jazz in schools. One of the responses found reads:

> I wish you to know that I am in sympathy with your work. I am sorry, however, that your magazine has begun to encourage the formation of dance orchestras in the school. They raise hell in plain English, with our regular band work. They also are in competition with the union musicians… It is my candid belief that jazz has absolutely no place in our public schools… I am sure that you will not be making any new friends by this move, and you may lose many old ones. (Luty, 1982)

Community colleges at predominantly black schools and some state funded universities in the Deep South began incorporating dance bands as early as the 1900's. It was not until 1947 that major institutions (University of North Texas and Berklee College of Music) would begin incorporating jazz courses into their music curricula.

In the summer of 1967, the Music Educators National Conference (MENC) gathered

music educators, musicians, scientists, labor leaders, sociologists, and representatives from corporations, foundations, and the government together in Tanglewood, Massachusetts in an effort to review the status of music education. After presentations from a variety of interested parties, and much deliberation among the participants, music from all periods, styles, and cultures were found to be acceptable in all music classrooms. Participants also agreed that changes needed to occur in the curriculum in an effort to prepare aspiring teachers to incorporate these new genres into music programs.

Despite efforts made by the MENC many music educators were reluctant to make the suggested changes. A lack of experience and pedagogical training were often cited as a major cause for exclusion of jazz in music classrooms. Because of the negative stigma associated with jazz, *Music Educators Journal* (MEJ) published several articles that focused on advocacy for jazz inclusion in schools. An early article (Hall, 1969) following Tanglewood introduced the National Association for Jazz Education. Hall listed seven purposes for forming the organization:

1. To foster and promote the understanding and appreciation of jazz and popular music and its artistic performance.
2. To lend assistance and guidance in the organization and development of jazz and popular music curricula in schools and colleges to include stage bands and ensembles of all types.
3. To foster the application of jazz principles to music materials and methods at all levels.
4. To foster and encourage the development and adoption of curricula that will explore contemporary composition, arranging, and improvisation.
5. To disseminate educational and professional news of interest to music educators.

6. To assist in the organization of clinics, festivals, and symposiums at local, state, regional, and national levels.

7. To cooperate with all organizations dedicated to the development of musical culture in America.

In 1971 Sister Mary Thomas Keating conducted an interview with famous jazz musicians and authors Jerry Coker and David Baker to discuss problems facing jazz educators following the Tanglewood Symposium. The content of that interview reflected much of what would be written over the next several years. These problems included: administrative support, jazz by specialists (not classically trained educators), the importance of teaching improvisation, jazz theory, jazz history, and jazz style in the classroom. (Keating, 1971)

Due to the relative absence of improvisational training in music teacher curricula, MEJ published several articles addressing this need. Much of the focuses of these articles were on beginners. Despite efforts made by MEJ and several other publications, improvisation in music education still remains a specialty skill honed in a few selective courses. Many music educators earn degrees with no training in basic improvisation techniques or methods of including this skill in their classrooms. This trend continues today despite the call for inclusion of improvisation as an essential musical skill put forth in the 1994 publication of the National Standards for Arts Education. Content Standard 3 states that students should improvise melodies, variations, and accompaniments, and yet, some music education majors remain untrained and unprepared to incorporate these skills in their respective classrooms. To address this need, many music publications have presented research-based studies and practical methodologies intended to promote inclusion of improvisation in a variety of music settings.

Much of the literature regarding improvisation is centered on personal methodologies for

teaching improvisation to varying levels of performers. There are numerous articles that address improvisation in the elementary music classroom (Azzara 1999, Brophy 2004, Burnard 1999, Kratus 1991, Marshall 2004a, Marshall 2004b, Meadows 1991, Riveire 2006, Scott 2007, and Volz 2005). Improvisation's important role in the Orff-Schulwerk method has made it a staple for articles addressing improvisation in an elementary music classroom. The Orff-Schulwerk method along with a variety of personal methodologies from experienced elementary teachers and researchers often focuses on rhythmic and melodic variations, as well as developing phrasing and melodic contour throughout improvised solos. These same concepts are echoed among beginning jazz band pedagogues discussing their own practical applications and ideas for introducing improvisation to novice instrumentalists (Dahlke 2007, Fratia 2002, Knox 2004, Meehan 2004, Snyder 2003, and Tomassetti 2003). Professional performers have also contributed significantly to the literature regarding improvisation. Countless interviews exist in a variety of music publications providing insight into artist-level musician's philosophies on improvisation, as well as their pedagogical experiences with music. Following its acceptance into academia, jazz pedagogues began writing books on more advanced methods, providing a framework for aspiring amateur improvisers to grow musically (Amadie 1991, Berliner 1994, Coker 1964, Coker 1978, Haerle 1975, Lawn & Hellmer 1993, Poulter 2008, Reeves 2006, Salvatore 1971, Steinel 1995).

Throughout the body of research regarding jazz improvisation, all writers champion the importance of listening to other performers as a way to grow as an improviser. Novice improvisers are often encouraged to transcribe existing solos for a variety of reasons, perhaps most importantly to develop a vocabulary of musical ideas to draw from in their own solos. Many performers and writers draw parallels between a child learning to speak and a musician learning to improvise (Berkowitz 2010, Hooper 2001, Stamm 2001, Steinel 1995). The harmonic

concepts serve like grammatical rules that provide order to the improvised solo. Memorized patterns and licks provide fundamental ideas from which to draw inspiration. While a great deal of agreement exists among jazz performers and pedagogues regarding the important concepts to develop among young performers, little research has asked the question of what explicit concepts artist-level performers are employing during a solo. The spontaneous nature of this art form, and our inability to measure what someone is thinking, makes it more difficult to diagnose these ideas.

This study was undertaken to contribute to the extant literature regarding improvisation and instruction. The method used in this study allowed professional performers to immediately reflect on, analyze, and report these musical concepts in a couple of ways. It is the hope of the researcher that this study will provide some insight into the specific concepts that professional musicians consider while they perform.

The purpose of this study was to analyze the musical concepts employed by expert jazz musicians while improvising over a standard jazz chord progression. These concepts were then compared to the participant's pedagogical experiences in music, in order to serve as a reference point for current and prospective music teachers to cite when teaching jazz improvisation. Answers were sought to the following questions:

> What musical concept categories are most frequently employed by individual artist-level musicians when analyzing their improvisation with the SCRIBE computer software?
>
> What musical concept categories are reported by individual artist-level musicians when asked to make comments related to their improvisation?
>
> Are there differences between the categorical self-analysis and comments analysis among the individual participants?
>
> Are there commonalities in the musical concepts categories that artist-level musicians select in their self-analysis?

Are there commonalities in the musical concepts categories that artist-level musicians select when commenting about their improvisation?

Are there differences among the musical concept categories selected in the self-analysis and comments analysis?

Are there correlations between the musical concept categories that participants employ and their pedagogical backgrounds in improvisation?

CHAPTER 2

REVIEW OF LITERATURE

This review is organized into three main sections. The first section addresses pedagogical methods and approaches to teaching improvisation in a variety of music settings. It begins with studies that promote improvisation in an elementary classroom, and continues with methods for teaching novice musicians in instrumental and choral settings. This section concludes with a discussion of pedagogical books intended to examine jazz improvisation for a variety of levels of musicians. These books address explicit concepts employed while improvising. Special focus is given to concepts such as scales, harmony, melodic variations, and transcriptions.

The second section is dedicated to research-based articles that explore improvisational achievement and cognitive development. The section begins with longitudinal studies that investigate elementary students' cognitive abilities in regard to improvisation. It continues with articles that compare improvisation achievement to a participant's musical background.

The third section discusses the observational method employed in this study referred to as stimulated recall. Stimulated recall is an observational technique in which participants review an activity immediately following the completion of that activity. This technique is often used by general education researchers investigating teacher behavior, and interactions between prospective teachers and students.

Pedagogical Methods

Elementary and Novice Improvisation Methods

While secondary music education struggles to implement improvisation into a standard curriculum, elementary music education has thrived as a result of pedagogical methods. Improvisation is a key element of the Orff-Schulwerk method. Pitched and non-pitched percussion instruments allow students to experiment without extensive technical and musical experience. Researchers and pedagogues promote this method and its many applications of improvisation. They have provided a variety of methods, philosophies, and practical tips for improvisation within elementary-aged students.

Kratus (1991) presents a multi-faceted approach to teaching improvisation to a variety of skill levels. He mentions that one would not teach improvisation skills to college students in the same manner as for elementary aged children. His multi-leveled approach addresses improvisation pedagogy as it applies to different areas of cognitive development among musicians. Kratus presents a seven level approach to improvisation. These sequential levels include: exploratory, process-oriented improvisation, product oriented improvisation, fluid improvisation, structural improvisation, stylistic improvisation, and personal improvisation. Each step adds more complex concepts and each level provides greater structure and frameworks to follow. He stresses that while teachers may wish to revert to lower levels as the complexity of music increases, no student should skip levels until each is mastered within the context of the exercises.

Scott (2007) suggests improvisational activities to accompany Kratus's sequential

approach. She also provides rationales for inclusion of improvisation in elementary classrooms, including: creativity and musical expression, improved musical skills, historical and cultural value, musical social interaction, and opportunities for musical assessment.

A variety of articles address sequential approaches to incorporating improvisation into a general music classroom. Brophy (2004) presents practical lessons for kindergarten aged children that continue successively through the sixth grade. Similarly, Marshall's (2004a) sequential method incorporates three steps for elementary-aged children: exploration, creativity, and improvisation. He suggests beginning with simple exploration activities that allow students to explore "limits and create unique sounds." As students become comfortable, simple parameters are set in the creativity process. Later, more defined expectations should be made and Marshall offers several resources that help shape these parameters. Marshall (2004b) follows up by presenting improvisational activities intended for elementary students. These activities are centered on melodic variations of familiar folk tunes. He advocates beginning with vocal improvisation to develop student's audiation skills. Volz (2005) and Meadows (1991) present similar sequential methods for presenting improvisation to beginning musicians. These basic approaches focus on free exploration with few parameters. Students begin with one-note solos exploring rhythm, articulation, and timbral concepts. They go on to give other simple activities for implementing improvisation in a variety of settings. Many of these activities are centered on the idea of representing a theme or character through free improvisation. Volz finishes his article by presenting some indicators that suggest moving on from exploration to higher order methods of improvisation.

Burnard (1999) observed elementary students instrument preference in regard to improvisational and compositional activities. Subjects preferred percussion based instruments for

improvisational activities. However, for compositional activities subjects chose tonal instruments that they had been trained on, in order to create and revise. Burnard suggests that students chose instruments they were comfortable with because this enabled them to incorporate material with which the student's body (conditioned patterns of movement) is familiar.

Riveire (2006) presents improvisational activities intended to reinforce musical concepts taught in a variety of music settings. She refers to these activities as games in order to ease tension when approaching improvisation. Games for beginning string class, intermediate bands, and advanced choir are all presented as examples and each exercise can be applied to any area of music. Unlike other articles on improvisation, Riveire suggests cadenzas and modern compositions that allow free interpretation as sources for exploration. Riveire finishes the article by validating the inclusion of improvisation in a public school setting. She discusses the higher order of cognitive abilities used while improvising and discusses the active listening skills it develops.

Music content standard 3 addresses improvisation in music education, and Azzara (1999) discusses the importance of including improvisation in all facets of music education in order to meet the expectations put forth in the National Standards for Arts Education. Azzara promotes improvisation as a creative activity but one that requires guidelines and frameworks for success. He continues by discussing the importance of learning a wide variety of melodies and harmonies by ear in order to easily facilitate this language while improvising. He links music to language/vocabulary and compares improvisation to the act of speaking. Azzara goes on to give brief practical methods for teaching improvisation in any music setting. He continues by discussing the importance of allowing students to experiment with improvisation in a "psychologically safe environment." He also discusses points to consider for evaluation, both by

the teacher and the students. He advocates the importance of motivic development, the use of silence, style, embellishments, and an understanding of the use of tension and release within a solo. Azzara finishes the article by discussing ways in which music teachers across all grade levels and specialties can work together to produce more proficient musicians and improvisers.

Many pedagogical methodologies focus on teaching improvisation to novice jazz improvisers. These often sequential approaches begin with the fundamentals of jazz, emphasizing form, rhythm, and melodic development. Some go on to promote ear training through call and response and simple transcription exercises. Tomassetti (2003) presents a three-step method for improving improvisation. In step one students explore two types of phrases – question (melodic solo ending on any note other than the root) and answer (melodic solo ending on the tonic) using the blues scale. In step two the student works on melodic energy and dramatic shape of a solo. In step three the student uses basic compositional techniques, such as motivic phrasing for thematic development. Snyder (2003) provides a sequential approach to teaching jazz improvisation to beginning instrumentalists. He begins with simple rhythmic activities. First students echo rhythms clapped by the teacher and then they begin creating their own four beat rhythmic patterns which are echoed by the class. Eventually an ostinato is added and finally students clap eight beat solos accompanied by a Jamey Aebersold recording. Students then transfer the same concepts to one, two, and three note solos, beginning with call and response activities on concert D and ending with eight beat solos that include the pitches D, Eb, and F accompanied by an ostinato. As students learn to play the first five notes of a scale they should begin to figure out simple melodies by ear. Snyder suggests having students first sing the tune then learn the first two measures by rote in class. They are then assigned to figure out the rest of the tune on their own. Students then begin to incorporate rhythmic and melodic variations of the

tune. The final step of this method has students improvising with a pentatonic scale. Knox (2004) and Dahlke (2007) offer similar methodologies for teaching improvisation to inexperienced soloists. They focus on the idea of transcribing existing solos and emulating sounds those students most appreciate. This foundation creates a vocabulary of melodic licks (a brief melodic phrase) that they can pull from in their own solos. The notes and rhythms should not be the only areas of focus. The nuances of each musician's timbre should be copied and replicated. Ultimately the student's goal should be to organize these memorized licks in logical ways and begin to apply them to other jazz charts (musical notation of the main melody that includes the accompanying chord symbols). Meehan (2004) provides more useful tips on ways to implement a jazz chart's melody while improvising. Meehan begins simply with playing a melody verbatim. He then begins to breakdown melodies by paraphrasing and eventually abstracting "bits and pieces" of the melody, re-organizing them to fit into the players own melodic concepts. Embellishment, rhythmic displacement, elongation, and the exclusion of unessential notes are all techniques Meehan suggests when paraphrasing the melody. Fratia (2002) also emphasizes imitation, ear training, stylistic training (swing), jazz effects, call and response, and eventually moves into 12-bar blues soloing. Fratia includes several simple Aebersold recordings to consider for use in this sequence.

While jazz and elementary music education have provided a strong foundation for improvisation education in America for 30 years, few methodologies existed promoting this standard in choral and vocal settings prior to the 21st Century. Freytag (2002) discusses practical techniques for vocal improvisation. His sequential method begins with memorization of the melody and includes concepts like phrasing, vocalizing with scat syllables and developing an understanding of harmonic implications. Weir (2003) presents more in-depth exercises for vocal

improvisation. Transcribing solos, memorization of typical rhythm changes, expansion of scat syllables, and practice with recordings and/or live players are the staples of her method. She suggests a sequential process when transcribing, beginning with instrumental solos, then bass lines, and finally vocal solos. Weir goes on to give a variety of daily exercises to expand the vocalist's solo vocabulary and familiarity with scales and chord changes. Bell (2004) presents a sequential approach to incorporating harmonic improvisation into a daily choral warm-up routine. Students begin sustaining chord tones and then switch every four counts. As they become comfortable on one chord the teacher would add chords (IV and V). Eventually students practice singing chord changes over familiar folk tunes and twelve bar blues patterns. Bell suggests transferring piano comping techniques (the chordal accompaniment performed during an improvised solo) to the choral ensemble by incorporating rhythmic variations and basic scat syllables. Ultimately students should begin experimenting with neighbor tones incorporating melodic stepwise motion before returning to chord tone pitches. When rhythmic variations are combined with this concept students can begin to improvise over 12 bar blues progressions while being accompanied by the choral comp patterns sung by the choir.

Since the 1980's, publications like *Jazz Education Journal*, *Music Educators Journal*, and more recently *JAZZed Magazine* have provided a valuable service to teachers who are ill prepared to teach improvisation. Articles from these sources continue to provide practical ways to include jazz in a variety of music classroom settings. These sequential approaches give educators a solid foundation from which to present these concepts. Common themes such as melodic and rhythmic development, structural considerations, transcriptions, and the development of a fluent jazz language are echoed in more advanced pedagogies.

General Methodology and the Jazz Language

Interviews and accounts from professional jazz improvisers and jazz pedagogues have provided a variety of approaches to improvisation. These focus on musical concepts and frameworks for improvisation, including harmonic implications, the use of specific scales, modes, and patterns, and transcriptions of professional improvised solos. Many of those interviewed promote jazz as a language learned through the process of transcribing.

Julien (2001) defines the concepts of functional and non-functional harmonies as they relate to jazz improvisation. She discusses roles of functional harmonies and gives examples of altered chords that can be substituted for diatonic functional chords. Non-functional harmonies are typically expressed in a more linear fashion as opposed to "root relations" and typical chordal resolutions. She finishes by discussing some of the freedoms of expression allowed by non-functional harmony, such as the diminished role voice-leading plays on harmonies that do not follow a standard progression.

Squinobal (2005) discusses more advanced aspects of improvisation and relates them in particular to John Coltrane. In Coltrane's *A Love Supreme* a variety of pentatonic scales are used repeatedly. These simple scales allowed Coltrane to focus on rhythmic, thematic, and timbral aspects of improvisation, which ultimately led him to free jazz. Squinobal focuses on the presentation of these aspects of improvisation to students today.

Cohen (2001) discusses interviews and conversations with high school instrumental jazz improvisation winners throughout the country. He presents practice techniques that these students employ when approaching new solos. Many rely on transcription exercises, while others point to professional experience as a major influence on their own styles. Ultimately the most

powerful influences were quality mentors who guided their practice and performance. One student also discussed the powerful influence and encouragement that the jazz legend Sonny Rollins had on him after meeting him at concerts, and corresponding with him via letters.

Dyne (2002) interviews professional jazz guitarist Bruce Forman regarding his improvisational and ensemble concepts. Forman discusses his “orchestral approach” to rhythm playing, and other aspects of supporting soloists as a rhythm section player. He goes on to discuss his “linear” approach to improvising. This style emphasizes shifting chord changes by “anticipating or delaying a chord change in their solo line” (p. 52). It also includes applying harmonic ideas melodically and vice versa. He goes on to advocate the importance of creating a unique voice while improvising.

Hooper (2001) discusses his philosophy of jazz improvisation and gives advice to aspiring improvisers. He discusses the need for discipline, knowledge of the composition, and a “creative persona” from the beginning. Hooper goes on to compare great speakers and writers to mature jazz improvisers. Those life experiences have expanded and shaped their solo vocabulary.

Several articles mention the importance of varying intensity within an improvised solo. Kane (2006) focused on the idea of developing contours within a solo by shaping the melodic contour. He provides a variety of tools to build intensity within an improvised solo. He suggests playing in a higher register, playing faster and more technical passages, agogic accents, unexpected phrasing, louder volume, repetition of a phrase, and dissonance. Kane encourages teachers to help students “move beyond playing the ‘right’ notes” (p. 21), to consider more overarching themes within their playing, equating these musical contours to the ebb and flow of a story being read.

Many authors, researchers, and improvisation pedagogues have drawn connections

between the process of learning to speak and learning to improvise. Stamm (2001) uses language as a platform for his improvisational approach. He advocates young improvisers immersing themselves in conversations with experienced players, comparing it to a child's process of acquisition of their native language. As a player becomes more experienced, they become more adept at having "conversations" with other musicians, using the tune as a basis for interaction. He points out that as we become comfortable with our native language, we do not consider syntax, grammar, or word structure because they come naturally. That same comfort will hold true with improvisers as they develop a strong foundation of musical ideas to draw from.

Jazz improvisation and language acquisition are used in two primary ways within the literature. The first includes musical concepts that are peculiar to the jazz idiom, and the second is comprised of melodic phrases and licks performed by professional jazz musicians. This is often referred to as jazz vocabulary. This vocabulary entails mostly theoretical music concepts that differ from traditional Western art music. The second refers to the acquisition of a music memory bank developed from standard jazz charts and recorded performances by professional musicians. This musical language provides novice improvisers with a solid foundation for exploration and development.

Pedagogical Books

Several jazz educators have espoused their own personal methodologies in books. Many present sequential approaches that might be appropriate for classroom texts. The books reviewed here present fundamental concepts like jazz vocabulary and continue with musical concepts such as chordal interpretations, melodic construction and variations, scales and modes and their

applications, transcription exercises, phrasing, motivic development, and stylistic considerations. These books often use jazz standard melodies and chord progressions to demonstrate the concepts they are presenting.

Poulter (2008) combines performance techniques, and rehearsal strategies. He approaches improvisation sequentially giving students a good foundation. The book begins with slow harmonic progressions, and includes more than 180 arrangements of jazz standards that are sequentially cataloged. This “Catalog of Jazz Ensemble Charts” ranks these standards based on their improvisational accessibility. This grading system allows jazz educators to select charts based on the difficulty of chord changes in the solo sections. The book also presents a history and philosophy of jazz education. Lawn & Hellmer (1993) present a similar approach that begins with basic jazz vocabulary, and continues discussing scales, melodic construction, harmony, keyboard voicing, rhythm, the blues, and organization as they relate to jazz improvising, arranging, and composing,

Another resource for aspiring and veteran jazz educators is Dunscomb and Hill's *Jazz Pedagogy: The Jazz Educator’s Handbook and Resource Guide* (2002). Chapter 9 is an introduction to basic improvisation and includes a section that discusses vocabulary peculiar to jazz. Chapter 10 provides sample lessons ranging from basic to advanced improvisation.

Salvatore (1971) deals specifically with the translation of jazz chords to their proper scale. He includes exercises designed to develop the performer’s ability with these principles. Haerle (1975) also focuses on scale work with a compilation of scales and their uses in jazz improvisation. All the modes (Ionian, Dorian, Phrygian, etc.) are presented, as well as major/minor pentatonic, whole tone, harmonic and melodic minor, and blues scales. He includes a list of chord types and appropriate scale forms to accompany each. Reeves (2006) also

organizes each chapter around learning a single scale/mode, common progressions (ii-V-I), song forms (i.e. blues), and rhythm changes. The emphasis is on building proficiency in playing all scales and modes in all twelve keys, and in building a vocabulary through the practice of "licks" and transcribed solos.

Amadie's (1991) methodology for improvising is based on his concept of tension and release. This approach frees improvisers from the constraints of imitation and sequential patterns in order to allow students creative freedom through aural analysis. Each concept presented is accompanied by examples from jazz standards to aid in illustrating points

Steinel (1995) created a workbook presented in four sections. It begins with the most basic elements, or "cells" from which songs are constructed. There are many practical examples of these 'cells' used in actual tunes and exercises. Each chapter contains a small amount of theory but the intention is to get the reader playing the examples. The final section is devoted to jazz vocabulary.

Coker (1964) provides a step-by-step guide for aspiring jazz improvisers on how to employ basic musical and theoretical tools, such as melody, rhythm, and superimposed chords. It contains practical exercises and musical examples. He includes explanations of chord symbols and appropriate scales to be played with each. In a follow up book, Coker (1978) discusses jazz concepts and guides listeners in their appreciation of this art. He devotes two chapters to improvisation. The first discusses the evolution of improvised solos from varied styles. The next chapter focuses on a few professional performers who are reflective of these changes in style, ranging from Louis Armstrong to Charlie Parker to John Coltrane.

Berliner (1994) presents an extensive five-part book that covers much of what has previously been discussed. He too presents improvisation as a language acquired through aural

and theoretical training. This book is based on years of interviews and personal experiences with a variety of professional jazz improvisers. In Part 1, Berliner discusses the growth and development process professional musicians went through as they developed their improvisational skills. The culture of the jazz community and its effects on the development of improvisation are also discussed. Part 2 discusses theoretical considerations in regard to improvisation as well as the importance of developing a vocabulary of musical licks, ideas, and phrases through transcriptions and aural analysis of expert improvisers. In part 3, Berliner talks about the collective nature of improvisation and the importance of interplay among artists. Part 5 presents a variety of outside influences that may affect performers, including the venue as well as the audience. This book also includes an extensive section devoted to improvisational examples used to illustrate points throughout the prose.

These books are representative of the growing number of improvisational materials available to music educators. These texts provide a foundation for educators to work from in a time where few received the formal training required to teach these concepts. While many of these are sequential, some technical facility on an instrument is required by the reader for these books to be successful.

Research-Based Improvisation Studies

Longitudinal Studies

Several researchers have investigated elementary student's improvisational achievement and cognitive development longitudinally as it relates to improvisation. These studies attempted

to describe appropriate ages to present improvisation based on the student's cognitive abilities. They also sought out correlations among young students who improvise well.

Guilbault (2009) replicated a study investigating the effect of root melodic accompaniment on students' ability to effectively improvise. This study compared the effect longitudinally from first through sixth grade to determine whether age has an effect on improvisational achievement. Similar to previous findings, participants who were given instruction in the root melody accompaniment received significantly higher improvisation scores than students who did not receive this instruction. There was no correlation found between improvisational achievement and age.

Brophy (2005) measured and compared melodic, rhythmic, and phrasing aspects of children's improvisation longitudinally. He found that students made positive gains in improvisational ability from age 7 to 9 with the greatest gains occurring after the first year. As they aged, improvisatory material began to incorporate fewer repeated melodic motives, a better adherence to the pulse, additional repeated rhythmic motives, and exhibited more phrase development.

Kiehn (2003) compared longitudinally the creativity of student's musical improvisation from grade two through grade six. Kiehn also looked for relationships among student's music improvisational creativity, figural creativity, and academic achievement. Results suggested a significant grade-level difference for improvisatory creativity. Subjects scored significantly higher in grade four than grade two, with little difference between grades four and six. Males scored higher on the music creativity test scores than females. A small correlation was noted between music creativity and figural creativity. There was no correspondence found between musical creativity and academic achievement.

Improvisational Achievement

Researchers have continued to investigate achievement regarding improvisation in several music settings. These researchers examined a variety of influences that affected their participant's abilities to improvise. Many investigated the subject's musical background in an effort to make correlations between their ability to improvise and their musical experience. Others tested pedagogical treatments to see if their methodologies were successful at improving participant's ability to improvise.

Guilbault (2004) tested the effect of root melodic accompaniment on student's ability to match pitch and effectively improvise. Results indicated no significant differences among the tonal achievement scores. The author suggests that young children might experience difficulty singing accurate melodies due to their limited vocal and mental development. However, the experimental group scored significantly higher on the improvised endings. This group was able to realize the chord changes more easily and play melodies that included pitches within the tonal areas provided by the accompaniment.

Azzara (1993) examined the effect of improvisation on fifth grade instrumentalist's musical aptitude and achievement. Results suggested that students who regularly participated in improvisational activities developed an increased understanding of harmonic progressions through the mental participation and physical performance of tonal and rhythmic patterns. These participants scored higher on the musical achievement etude performances, suggesting that the ability to improvise appears to transfer a "clearer comprehension of the tonal, rhythmic, and expressive elements of music in an instrumental performance from notation" (340). No significant differences were found among musical aptitude scores between groups.

Ward-Steinman (2008) investigated the achievement of vocal jazz improvisers and made comparisons to their musical background. One hundred and two participants were asked to improvise over four varied improvisational examples (blues, rhythm changes, summertime, free). A questionnaire was administered to assess participants experience with jazz and classical music background. Participants were rated higher for free improvisation examples. High achievers often had extensive jazz experience. Those that took classes and listened to jazz recreationally also received high scores. Style, creativity, and musicianship were categories in which high achievers excelled. There was a negative correlation found between extensive classical vocal training and poor improvisational achievement. Madura (1996) also investigated variables that impacted improvisational achievement among vocalists. Jazz theory knowledge, jazz experience, and imitative ability were the strongest indicators of achievement among the subjects tested. Instrumental and vocal lessons, gender, and general creativity were not found to be significant predictors in regard to vocal improvisation.

May (2003) tested and assessed 73 participants to measure theoretical knowledge, aural skills, aural imitation, and improvisational achievement. Judges listened to two examples (“F Blues” and “Satin Doll”) from participants seven times and evaluated each example. A survey was administered regarding experience and participants rated themselves as beginner, moderate, or advanced as improvisers. The Instrumental Jazz Improvisation Evaluation Measure was created and used to evaluate performances and was found to be reliable as a measure of achievement, as was the self-evaluation survey. Rhythmic dimensions of achievement were lowest with the up tempo blues chart, implying that tempo could have an effect on rhythmic diversity and creativity. Participation in improvisational classes was again a strong predictor of high achievement.

Watson (2010) investigated the effects of two pedagogical approaches to teaching improvisation to see which was more effective at producing higher achievement during a solo. Subjects participated in one of two instructional groups intended to teach and improve their jazz improvisation skills. One group received aural instructions while the other group received instruction primarily through notated exercises. Each individual was recorded playing over chord changes ("Perdido") prior to and following the instructional treatment. Subjects also rated their own improvisational achievement (self-efficacy) before and after the treatment sessions. Each solo recording was rated by four judges using a researcher-constructed evaluation measure. Results suggested that both instrumental treatments advanced improvisational achievement. Aural instruction had a greater positive effect on improvisational achievement than notated exercises. No correlation was found between jazz experience and achievement. Self-efficacy ratings also increased following both treatments.

Norgard (2008) investigated what he referred to as "the thought processes" that seven artist-level jazz musicians employed while improvising over an improvised blues progression solo. These improvisers were accompanied by a drum track only. Solos were recorded and digitally transcribed during the performance. Samplitude 9 Professional was the computer software used to notate the MIDI recording of the artists' solos. This software does not produce exact transcriptions. This approximate notation provided a point of reference for the interview process that followed. Norgard broke up the solo into logical phrases, and each phrase was played individually for the artist. Following each phrase, the participants described in a directed interview the thinking processes that they employed while soloing. They were specifically instructed to comment on the explicit thoughts that shaped their solos. These processes were then analyzed and coded. One hundred and twenty-one codes were assigned from 563 quotations from

the seven artists' interviews. Six major themes emerged from this analysis. Norgard found that all seven participants incorporated two “ongoing processes” within their solos: a sketch planning process, and an evaluative monitoring process. The sketching process happens extremely quickly and provides a framework from which the artist shaped their solos. The evaluative process was found to influence choices made during the solo based on successful and unsuccessful phrases and licks. Norgard also identified four musical concepts that were common among the participants, including memorized licks (idea bank), harmonic structure, the contour of the melody, and re-occurring themes and motives within the solo. Harmonic structure was the concept cited most often among the seven participants.

These “thought processes” are common among the literature reviewed. Harmonic functions such as chord qualities and standard chord progressions have become a staple for improvisation among modern jazz musicians. The use of transcribed solo material, existing melodies, and memorized licks has also served as important musical concepts for jazz improvisation. These musical concepts along with melodic variations, rhythmically inspired licks, the use of scales and modes, and melodic contour (especially as it relates to intensity within solos) are all common elements found in pedagogical and research-based studies regarding improvisation. It is for this reason that these concepts were chosen as the explicit thought processes investigated in the current study.

Stimulated Recall

Because of the unique nature of improvisation, traditional methods of observation make it difficult for researchers to suggest what makes one individual successful and another

unsuccessful. It is for this reason that the current study employed stimulated recall in the method. Stimulated recall is an observational research method used to stimulate a subject's memory regarding activities, gestures, interactions, cognitive thought processes, and more. Benjamin Bloom (1953) was the first to use this phrase. Bloom audio taped lectures at the University of Chicago and, using the tapes, asked students to recall particular points made. He found that students were able to recall these "overt, checkable events" with 95% accuracy.

A variety of fields have used this method to stimulate memories of subjects including counseling, analytical research, medical consultations, and education. This method became quite popular during the 1970's and 1980's when researchers began studying the behaviors and habits of teachers. The audio (and later video) tapes allowed teachers to reflect on their own classroom behavior and discuss their instructional decisions (Calderhead, 1981). This method became particularly beneficial when used with student teachers. Cooperating teachers were now able to explain, rationalize, and interpret responses to students with their student teachers (Stough, 2001). This reflective procedure has proven to be a beneficial and reliable observational method. The current study sought to incorporate this method for reflection following an instrumental improvisation activity.

While several methodologies exist espousing formulas for successful improvisation, little research focuses on exactly what artist-level improvisers are thinking while they perform. Many of the studies that do address this interview these musicians well after the performance, sometimes several years. Certainly time plays a detrimental role on memory and the accuracy of these studies. The methodology used here allows the artists to immediately reflect on their thought processes, enabling them to accurately recall the musical concepts they incorporate while improvising.

The purpose of this study was to analyze the cognitive thought processes used while improvising over a standard jazz chart. The stimulated recall method was employed directly following each solo example and subjects were asked to classify the musical concepts used while improvising.

CHAPTER 3

METHOD

The purpose of this study was to investigate the musical concepts that are employed by artist-level jazz performers while playing an improvised solo. These concepts were then compared to the participant's pedagogical background regarding improvisation. Professional artist-level jazz improvisers were selected as participants in this study. These improvisers received personal and professional accolades from members throughout the jazz community. Appendix A includes biographical information regarding each participant, including educational experiences, awards and honors, and professional recordings.

Each participant was video recorded improvising over a Jamey Aebersold recording of "Take the A Train." This song was selected because of the altered second chord in the progression and the emphasis of a different tonic center in the B section. This was done to ensure that performers were not blanketing simple diatonic licks throughout their improvised solo.

Participants began by playing through the main melody (head) to establish key areas and provide a melodic foundation before being recorded. After completing the head each subject improvised through the entire changes (AABA) twice. Participants were video recorded digitally to ensure good sound quality upon playback.

Upon completion of the improvisation, a script was read defining each musical concept

category that participants would subsequently use to analyze their solos. Directly following the task, each participant reviewed their performance. Subjects were advised to consider what explicit musical concepts they were employing throughout the solo. Following the first viewing, each performer watched his performance again and coded the musical concepts employed in the improvisation using a computer program called Simple Computer Recording Interface for Behavioral Evaluation (SCRIBE). SCRIBE allows the user to record the frequency and duration of observed events. This program permits the user to develop "screen based input windows" (Duke 1999) to record a variety of behaviors or any other observed variables. The user creates buttons that correlate with each defined behavior. The user clicks on the button as the behavior is observed and SCRIBE presents a chronological summary of the events upon completion. SCRIBE also creates summaries of duration and frequency counts of the observed behaviors. The duration measure was disabled for this study. Thus, subjects' analyses included only frequency counts of the musical concept categories.

The participants listened to the video recording and simultaneously coded the musical concepts they employed using the SCRIBE software. The buttons used to code these concepts included: melodic variation, rhythmic emphasis, scales or modes, chords or arpeggios, memorized licks, range/intensity, sequence, and other.

A pilot project revealed the need for clarification of thought processes coded as "other". As a result, a third viewing was added to the procedure to record the participants' comments about their solos. This allowed participants to identify or discuss thought processes other than the prescribed categories. It also allowed the subjects to code more than one concept at a time, which is a limitation of the SCRIBE software. Transcriptions were made of each interview that were coded and compared to the categorical self-analysis data. The use of three listening tasks was

included to increase reliability among the participants. Subjects who participated in the pilot project suggested multiple listening opportunities in order to increase validity and accuracy. The addition of the "other" button was also included to ensure validity, due to the individual nature of improvisation.

The musical concepts categories were developed considering the extant literature, as well as discussions with participants following the pilot project. Definitions of these concepts were read to ensure reliability among participants. Musical Concept categories were defined as:

Melodic Variation: the use of melodic content drawn directly from the tune with which the improviser is soloing. This might include direct quotes from the song or any variation derived from its melody.

Scales or Modes: the use of a particular scale or mode to shape the melodic contour of the solo. There are a variety of options in regard to this concept. This could include any of the standard scales and modes as well as altered scales developed within the jazz community (blues, altered pentatonic, etc).

Chords or Arpeggios: the use of chord spellings and their related arpeggios to shape the melodic contour of the solo. A distinction should be made between this concept and scales. The focus here is on chord qualities and melodies shaped by chordal techniques like arpeggiation.

Memorized Lick: the use of a memorized phrase(s) within a solo. This excludes melodic content drawn from the tune with which the improviser is soloing. This could include a variety of melodic content, including: a melodic phrase/variation from another tune, a memorized lick used for standard harmonic progressions (e.g. ii-V-I), or any other pre-conceived musical phrase.

Sequence: a melodic or harmonic pattern successively repeated at different pitches. This concept was added prior to the first observation. Originally it was a part of the memorized lick concept, but the first participant (Brubeck) suggested that it be included as its own subject due to the large amount of instances he felt it would be used.

Rhythmic Emphasis: the use of rhythmically driven motives within a solo. The focus here is on rhythm as opposed to melodic contour.

Range/Intensity: the use of expanded ranges to emphasize a different tone color, and/or to build intensity within the solo.

Other: this is included to ensure that participants are not limited in their choices. The interview process that follows the categorical self-analysis session is partially intended to clarify the meaning in regard to these instances.

A questionnaire was administered following each interview to identify the pedagogical backgrounds of the participants. Educational background findings from this questionnaire were compared to the musical concepts each participant employed while improvising to investigate correlations.

The purpose of this study was to compare musical concepts employed by artist-level jazz musicians performing an improvised solo. This study sought to identify commonalities among the musical concepts these musicians employ while improvising, and how these commonalities might relate to their pedagogical backgrounds.

CHAPTER 4

RESULTS

Seven artist-level jazz musicians were video recorded while improvising two choruses of "Take the 'A' Train". Upon completion of the improvisation, a script was read defining each musical concept category that participants would subsequently use to analyze their solo. Each participant viewed the recording three times directly following the performance. During the first review participants were asked to make preliminary assessments of their improvisations using the eight categories. During the second review, participants used a computer application (SCRIBE) to categorize segments of their solos that were attributable to the specific musical concepts categories. Categories included: Melodic variation, scales/modes, chords/arpeggios, memorized lick, rhythmic emphasis, sequence, range/intensity, and other. Participants' comments about their solos were recorded during the third viewing. After the third viewing each soloist completed a questionnaire regarding his pedagogical experiences with jazz improvisation.

Quantitative and qualitative analyses of the data revealed trends among the seven participants. Quantitative analysis results were obtained via each participant's categorical analysis. The pedagogical questionnaire and performer's comments were included in the qualitative analysis.

This chapter presents individual results for each participant, including categorical data

results, coded artist's comments with transcribed musical examples, and summaries of each participant's questionnaire. Each example is displayed in concert pitch to allow ease of comparison among the different instruments. For this reason the chord and pitch references in the comments have been transposed to concert pitch (all comment examples are placed in the key of C). Following the individual results section is a comparative analysis section of the combined data collected in the study. A comparison of all the categorical results is presented first, followed by the combined comments results, and a comparison of the combined categorical self-analysis and comment results. The final section of this chapter presents individual results of each musical concept category.

Individual Results

Chris Brubeck

Categorical Analysis Results

Brubeck identified 9 musical concepts in his improvisation that he categorized in his analysis, with a range of 0 to 4 moments for each category. There were 3 categories that he did not select during his categorical analysis: melodic variation, rhythm, and "other". Brubeck selected sequence 4 times accounting for 44.4% of his results. Table 1 compares Brubeck's frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 1

Brubeck's Categorical Analysis Data And Mean Categorical Analysis Data

Musical Concept	Brubeck Frequency	Mean Frequency	Brubeck %	Mean %
Melodic Variation	0	2.6	0	12.9
Scale/Mode	1	3.4	11.1	17.3
Chord/Arpeggio	2	2.7	22.2	13.7
Memorized Lick	1	4.4	11.1	22.3
Rhythmic Emphasis	0	1.7	0	8.6
Sequence	4	3.1	44.4	15.8
Range/Intensity	1	1.4	11.1	7.2
Other	0	0.4	0	2.2

Brubeck reported fewer instances for 7 of the 8 categories than the average among the other participants. Four of the musical concept categories were similar to the mean among the other performers. Chord/arpeggio (2), sequence (4), range/intensity (1), and “other” (0) were all within 1 occurrence of the mean. Sequence (4) was the only category he selected more often than the mean (3.1). Sequence accounted for 44.4% of his total data, as opposed to the 15.8% average among the participants. Chord/arpeggio accounted for 22.2% of Brubeck’s total SCRIBE analyses, as opposed to the 13.7% average among the performers. Brubeck did not report an instance of melodic variation or rhythmic emphasis in his categorical analysis, 2.6 and 1.7 instances less than the average. Melodic variation accounted for 12.9% of the total categorical analysis data among the performers, and rhythmic emphasis accounted for 8.6%.

Brubeck's Comments

Comment 1 - OTHER (pure improvisation), SEQUENCE “Ok, so that’s really just a pure improvisation, but I’m working with the first little sequence. I did it three times.”

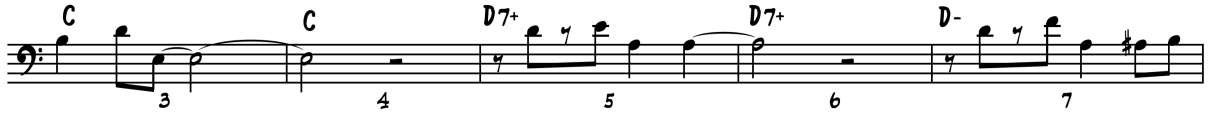

Figure 1. Brubeck comment 1, m. 3-7.

Comment 2 – CHORD, LICK “There was a quick little Bb major seventh, and for a second I almost quoted “Gary Indiana, Gary Indiana”, and then pulled out of it.”

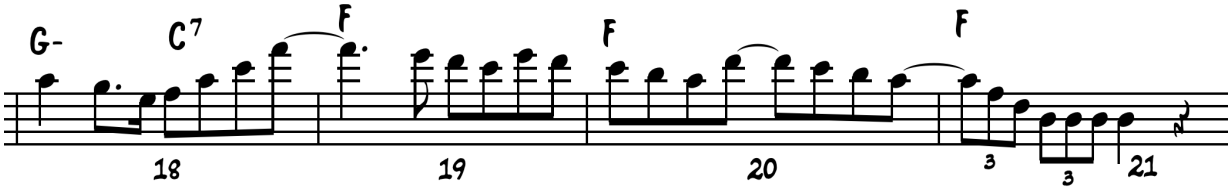

Figure 2. Brubeck comment 2, m. 18-21.

Comment 3 - SEQUENCE “That’s a little sequence.”

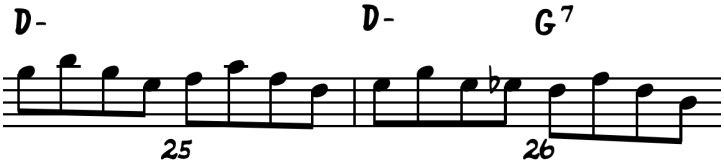

Figure 3. Brubeck comment 3, m. 25-26.

Comment 4 - LICK “I almost did “It’s Raining, it’s Pouring, the Old Man is Snoring”, but I didn’t really mean to.”

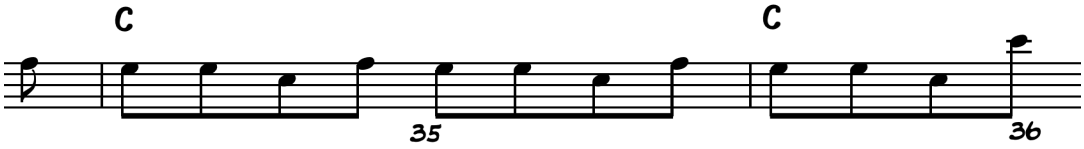

Figure 4. Brubeck comment 4, m. 34-36.

Comment 5 - RHYTHM: “Then I did an off-beat thing, which, live a drummer would have picked up on and caught right away.”

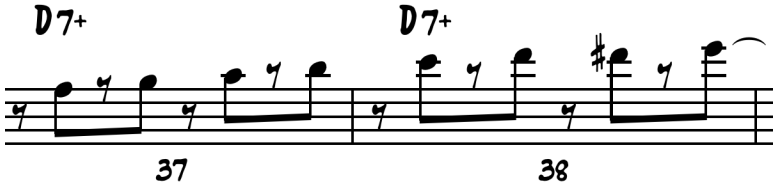

Figure 5. Brubeck comment 5, m. 37-38.

Comment 6 - RANGE/INTENSITY: “When I held that long note, part of the reason I did that was because I wanted to hear the track, so I decided I’d stop playing long enough to see what was cooking.”

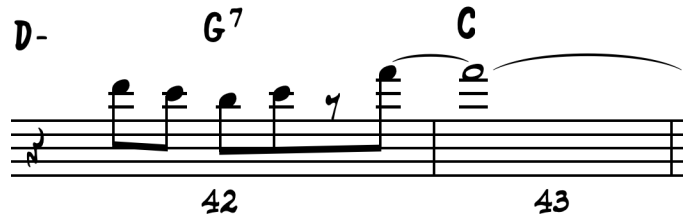

Figure 6. Brubeck comment 6, m. 42-43.

Comment 7 - RANGE/INTENSITY: “I wasn’t sure if I was playing two choruses or three, but I was trying to sort of build an arch so I was ending up high in my solo. Sort of bring closure to the solo. A little more power.”

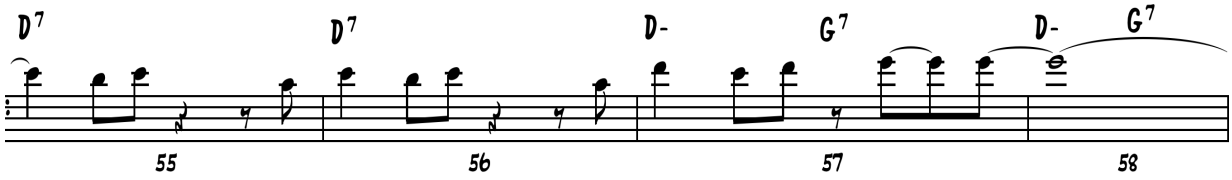

Figure 7. Brubeck comment 7, m. 55-58.

Summary of Comments

Brubeck made nine comments that were coded using six of the eight categories, with a range of 0 to 4 for each category. Brubeck did not mention any instances of scale/mode or melodic variation in his comments. He mentioned memorized lick, sequence, and range/intensity most often (2), each accounting for 22.2% of his total coded categories. Table 2 compares Brubeck’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 2

Brubeck's Coded Comments Data And Mean Coded Comments Data

Musical Concept	Brubeck Frequency	Mean Frequency	Brubeck %	Mean %
Chord/Arpeggio	1	3.86	11	21.1
Memorized Lick	2	3.14	22	17.2
Scale/Mode	0	2.86	0	15.6
Sequence	2	2.71	22	14.8
Range/Intensity	2	1.57	22	8.6
Rhythmic Emphasis	1	1.57	11	8.6
Other	1	1.57	11	8.6
Melodic Variation	0	1	0	5.5

Brubeck identified range/intensity 2 times, accounting for 22% of his total coded comments, as opposed to the 8.6% average for range/intensity among the performers. His results for memorized lick, sequence, rhythmic emphasis, “other”, and melodic variation were similar to the mean with the greatest difference being 1.14 occurrences. Brubeck did not mention an instance of the scale/mode category within his comments, 2.86 occurrences less than the average. Scale/mode accounted for 15.6% of the total coded comments among the participants. He also discussed fewer instances of chord/arpeggio (1) than the mean (3.86). It accounted for 11% of his total comments as opposed to the 21.1% average among the participants.

Comparison of Categorical Analysis Results and Coded Comments Results

Brubeck’s categorical analysis results and coded comments results were similar for 7 of the 8 categories. The differences between categorical selections and coded comments for

melodic variation, scale/mode, chord/arpeggio, memorized lick, rhythmic emphasis, range/intensity, and "other" were all 1 or fewer. Brubeck selected sequence 4 times in the categorical analysis, but only 2 comments were coded as sequence. Table 3 compares the frequency of occurrences for musical concept categories in his categorical analysis and the coded comments analysis.

Table 3

Brubeck's Frequency of Occurrences For Categorical Analysis And Coded Comments

Musical Concept	SCRIBE Frequency	Comments Frequency	+/-
Melodic Variation	0	0	0
Scale	1	0	-1
Chord	2	1	-1
Lick	1	2	+1
Rhythm	0	1	+1
Sequence	4	2	-2
Range	1	2	+1
Other	0	1	+1

Brubeck Questionnaire Summary

Brubeck was the only participant who did not take improvisation lessons or participate in an improvisation class. He cited a "sense of melody, variation of the melody, understanding the chord structure, and outlining/arpeggiating the chord" as musical concepts he emphasized in his early attempts at jazz improvisation. When asked what concepts Brubeck felt he emphasized in his current playing he wrote:

> All musical experiences lead to increasing your improv vocabulary. Quoting other musical material. When you start off you are very concerned about having your personal playing skills together. As you get better, you learn to get out of your personal headspace and listen and react to what other people in the band are doing. This keeps improv fresh because there are an infinite amount of possibilities on the bandstand to react to. That's improvisation.

He wrote that "time, a thousand experiences with hundreds of musicians" influenced the change in emphasis from early improvisation efforts.

Dr. Jack Cooper

Categorical Analysis Results

Cooper identified 17 instances in his improvisation that he categorized in his analysis, with a range of 0 to 5 moments for each musical category. There were 3 categories that he did not select during his categorical analysis: melodic variation, rhythmic emphasis, and "other". Cooper selected memorized lick most often (5), account for 29.4% of his analysis results. Table 4 compares Cooper's frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 4

Cooper's Categorical Analysis Data And Mean Categorical Analysis SCRIBE Data

Musical Concept	Cooper Frequency	Mean Frequency	Cooper %	Mean %
Melodic Variation	3	2.6	18.5	12.9
Scale/Mode	4	3.4	23.5	17.3
Chord/Arpeggio	0	2.7	0	13.7
Memorized Lick	5	4.4	29.4	22.3
Rhythmic Emphasis	0	1.7	0	8.6
Sequence	4	3.1	23.5	15.8
Range/Intensity	1	1.4	5.9	7.2
Other	0	0.4	0	2.2

Six of the categories in Cooper's analysis were similar to the mean results of the other performers. Melodic variation (3), scale/mode (4), memorized lick (5), sequence (4), range/intensity (1), and "other" (0) were all within 1 occurrence of the average. Cooper did not select chord/arpeggio and rhythmic emphasis in his analysis. These concepts accounted for 13.7% and 8.6% of the total number of categories selected among the performers.

Cooper's Comments

Comment 1 - RANGE “I’m starting simple and low. I try and do that to give myself a starting place. So I started low on the horn and that first lick (sings) is just a simple thing as a starting point.”

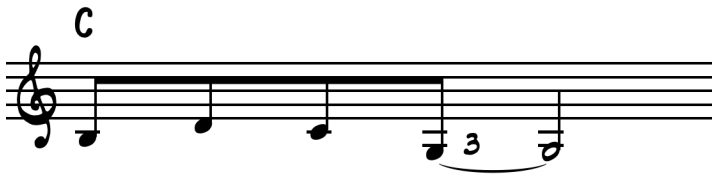

Figure 8. Cooper comment 1, m. 3.

Comment 2 – SCALE “That’s use of a blues scale. The use of the minor 3rd and the major 3rd is a blues type of thing that I like doing when the chord resolves back to the key of C.”

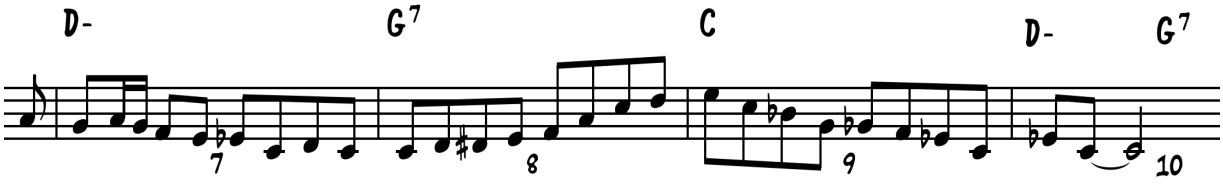

Figure 9. Cooper comment 2, m. 7-10.

Comment 3 – SCALE, OTHER (motivic development) “I’m continuing that idea here because now I’m playing the pentatonic scale that relates to that blues scale that I just set up. I ended with it in the first chorus and now in the second chorus I’m starting with it. It’s like the last part of a paragraph setting up the next paragraph.”

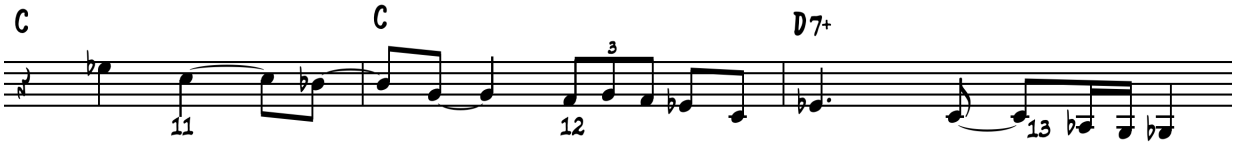

Figure 10. Cooper comment 3, m. 11-13.

Comment 4 – OTHER (motivic development) “That’s just thematic development. When I start on the bridge its just thematic development.”

Figure 11. Cooper comment 4, m. 19-22.

Comment 5 - LICK “Before that is a number of standard bebop kind of language things. That’s very much common language kinds of things that I’m playing that I learned from Charlie Parker, Cannonball Aderly, and those guys.”

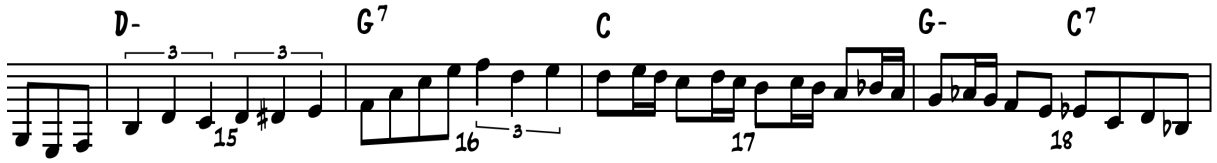

Figure 12. Cooper comment 5, m. 15-18.

Comment 6 - SCALE “That’s a verbatim diminished scale that runs across. It’s related to the V chord coming back to the key of C. Just an ascending diminished scale verbatim.”

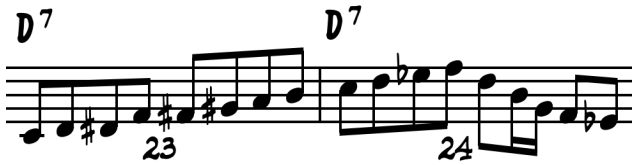

Figure 13. Cooper comment 6, m. 23-24.

Comment 7 – OTHER (rhythmic imitation), SCALE “That’s really kind of an important one. In the accompaniment there’s a lick that the guy plays (sings). By the time I heard it I respond to him. I played in whole tone though on the V of V chord, because that’s the second chord in “A Train”, that secondary dominant. So on the secondary dominant I convert that over to whole tone and I play the rhythmic thing. I’m answering it.”

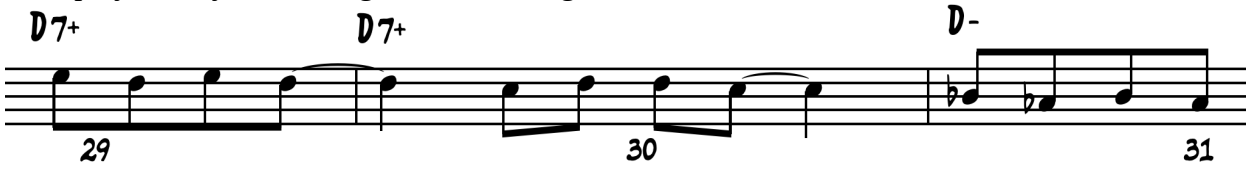

Figure 14. Cooper comment 7, m. 29-31.

Comment 8 – MELODIC VARIATION, LICK “That’s a little bit of a quote from the accompaniment that is in the original. (sings) That’s part of Ellington’s original arrangement, which I know really well. I’ve played it a lot of times out on the road. So that’s kind of inside here (points to head), inside the computer of knowing those licks from the original of Ellington. So that’s a little bit of a quote from the original.”

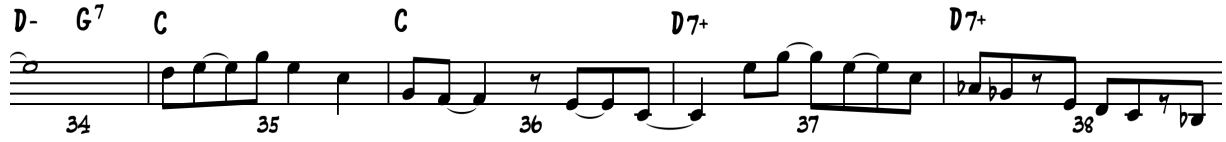

Figure 15. Cooper comment 8, m. 34-38.

Comment 9 - SEQUENCE “And I’m using it as a sequence.”

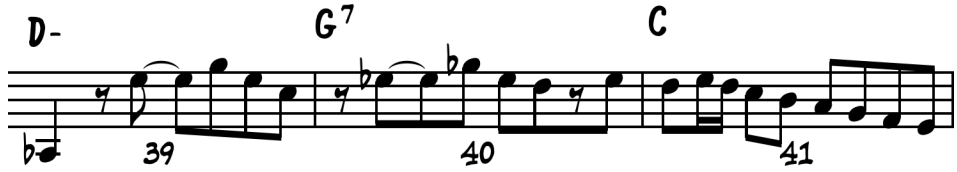

Figure 16. Cooper comment 9, m. 39-41.

Comment 10 – MELODIC VARIATION “Another quote. That’s quoting the tune (sings). So I’m using the tune itself for parts of the solo.”

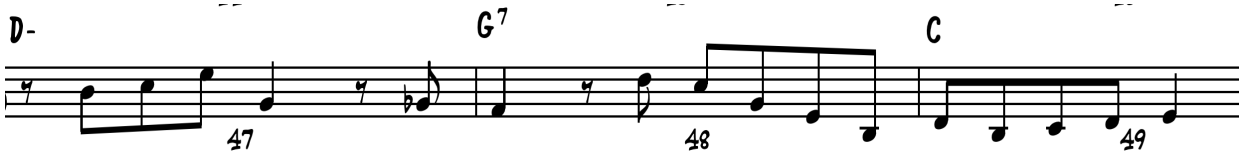

Figure 17. Cooper comment 10, m. 47-49.

Comment 11 – SEQUENCE “That’s a sequence.”

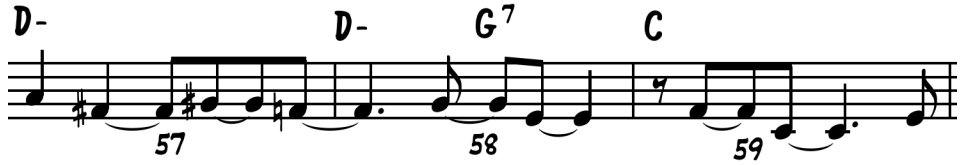

Figure 18. Cooper comment 11, m. 57-59.

Comment 12 - CHORD “Right before it I was making sure to hit on the, I guess you’d call it the secondary dominant function. That chord, that dominant chord, is really important to the sound of the bridge. I make sure that the color of that chord is there.”

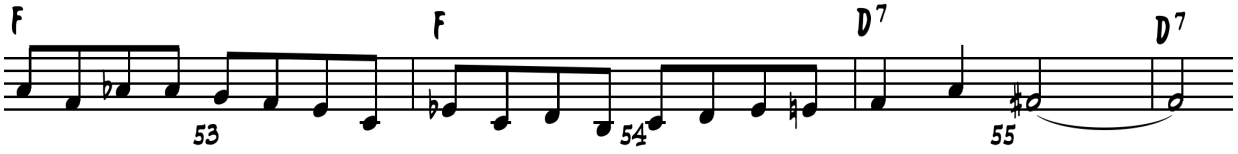

Figure 19. Cooper comment 12, m. 53-55.

Comment 13 – (summary) “It’s pretty consistent. I guess the main thing is that you hear quotes from different parts of ideas that I use that are parts of the tune. I’m using a lot of common language bebop things. And kind of typical of my playing, I hear sequencing. It’s kind of the way I write and the way I play. There’s a sequencing thing that happens. I guess I’ve gravitated towards players that do that, and I’ve gravitated towards writers that do that and can do it well. Like Beethoven and people like that. Bob Brookmeyer does it really well too as a jazz writer. I try to utilize the harmonic things that are there. On “Girl from Impanema” and “Watch What Happens,” a Michel Legrand tune, where the second chord is that secondary dominant, it’s that five of five chord, I will tend to use an augmented sound on that, or a Lydian dominant sound on that to make it distinct from the first tonic chord. Though the chord moves up by step, I will use something to make those two chords sound a lot different, because it tends to be that a lot of guys will just blanket. So on this tune in particular; there is a way I improvise over it and the tunes that are like it that I named.”

Summary of Comments

A total of 15 musical concept categories were coded from Coopers comments. He discussed 7 of the 8 categories, with a range of 0 to 4 for each category. Cooper did not mention any instances of rhythmic emphasis in his comments. His comments were most frequently categorized as scale/mode, accounting for 26.7% of his total coded categories. Table 5 compares Cooper’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 5

Cooper's Comments Data And Mean Comments Data

Musical Concept	Cooper Frequency	Mean Frequency	Cooper %	Mean %
Chord/Arpeggio	1	3.86	6.7	21.1
Memorized Lick	2	3.14	13.3	17.2
Scale/Mode	4	2.86	26.7	15.6
Sequence	2	2.71	13.3	14.8
Range/Intensity	1	1.57	6.7	8.6
Rhythmic Emphasis	0	1.57	0	8.6
Other	3	1.57	20	8.6
Melodic Variation	2	1	13.3	5.5

Cooper identified scale/mode 4 times, accounting for 26.7% of his total coded comments. While his frequency of occurrences was not much more than the mean (2.86), the scale/mode category accounted for 11% more of his total than the mean percentage of coded concepts. Cooper made 3 comments that were coded as “other”, almost twice as many as the average. His total percentage for the “other” category (20%) was noticeably higher than the mean among the participants (8.6%). Cooper’s comments results for four of the categories were similar to the mean of the participants. His results for memorized lick, sequence, range/intensity, and melodic variation were all close to the mean with the greatest difference being 1.14 occurrences. None of his comments were coded as rhythmic emphasis, 1.57 occurrences less than the average. This category accounted for 8.6% of the total number of categories selected. Cooper also made fewer chord/arpeggio comments (1) than the mean (3.86), only accounting for 6.7% of his total number of coded comments, as opposed to the 21.1% average among all performers.

Comparison of Categorical Analysis Results and Coded Comments Results

Cooper's categorical analysis results and coded comments results were similar for 5 of the 8 categories. The differences between the categorical analysis and coded comments for melodic variation, scale/mode, chord/arpeggio, rhythmic emphasis, and range/intensity were all 1 or fewer. Cooper selected memorized lick 5 times during the categorical analysis, but only made 2 comments that were coded as memorized lick. He also selected sequence 4 times during the categorical analysis, but only made 2 comments coded as a sequence. There were 3 comments made that did not correspond with a prescribed category, and were therefore coded as "other". Cooper did not select the "other" category during his categorical analysis. Table 6 compares the frequency of occurrences for musical concept categories in his categorical analysis and the coded comments analysis.

Table 6

Cooper's Frequency Of Occurrences For Categorical Analysis And Coded Comments

Musical Concept	SCRIBE Frequency	Comments Frequency	+/-
Melodic Variation	3	2	-1
Scale	4	4	0
Chord	0	1	+1
Lick	5	2	-3
Rhythm	0	0	0
Sequence	4	2	-2
Range	1	1	0
Other	0	3	+3

Cooper Questionnaire Summary

Cooper studied improvisation in a private studio and took classes in improvisation. He cited “making [a] good melody, having a good jazz ‘time’ feel” as concepts that were emphasized in those lessons and classes. When asked what concepts he emphasized in his early improvised solos, Cooper wrote, “not playing wrong notes! Playing the correct chord changes.” These are the concepts he continues to emphasize in his solos.

Victor Goines

Categorical Analysis Results

Goines identified 24 moments in his improvisation that he categorized in his analysis, with a range of 0 to 5 instances for each musical concept category. “Other” was the only category that he did not select. He was varied in the remaining categories he identified during his analysis. Excluding the “other” category, Goines had at least 2 instances of each musical concept. Scales, rhythm, and sequence were all recorded 5 times, accounting for 62.5% of the categorical analysis data. Table 7 compares Goines’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 7

Goines' Categorical Analysis Data And Mean Categorical Analysis Data

Musical Concept	Goines Frequency	Mean Frequency	Goines %	Mean %
Melodic Variation	2	2.6	8.3	12.9
Scale	5	3.4	20.8	17.3
Chord	2	2.7	8.3	13.7
Lick	3	4.4	12.5	22.3
Rhythm	5	1.7	20.8	8.6
Sequence	5	3.1	20.8	15.8
Range	2	1.4	8.3	7.2
Other	0	0.4	0	2.2

Goines selected rhythmic emphasis 5 times, more than 3 occurrences over the average. He was one of three participants who recorded any instances of rhythmic emphasis in their categorical self-analysis (Haydon 6, and Panella 1). This accounted for 20.8% of his total data, as opposed to the 8.6% average for rhythm among all the participants. He also reported higher instances of scale/mode (5) and sequence (5) than the averages (3.4 and 3.1). His total percentage for these two categories (20.8%) was similar to the average (17.3% and 15.8%) among the participants. Goines's results for melodic variation, chord, range, and "other" were similar to the average with the greatest difference being less than one instance. Memorized lick was the musical concept listed most often among participants; however, Goines selected it 3 times, 1.4 fewer than average. This accounted for only 12.5% of the total number of musical concepts, as opposed to the 22.3% average among all performers.

Goines' Comments

Comment 1 - RHYTHM “OK. In the break right there after the melody is played, I’m more interested in the rhythmic precision to try to make sure that music continues to move forward. Because the break is like the moment of truth.”

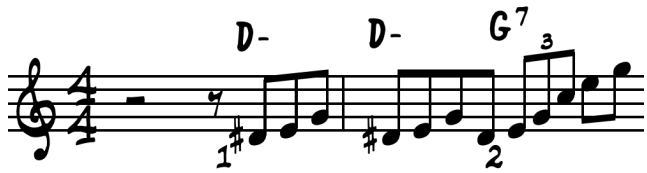

Figure 20. Goines comment 1, m. 1-2.

Comment 2 - SCALE “Right here I’m dealing with the sharp 4, the Mixolydian/Lydian side.”

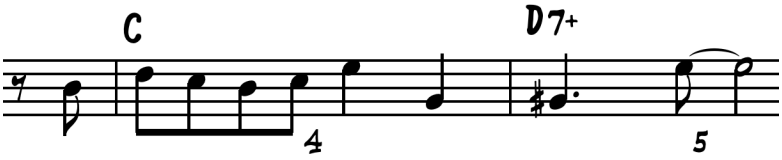

Figure 21. Goines comment 2, m. 4-5.

Comment 3 - LICK “Right there I had a little bit of a quote out of “Cool Blues” by Charlie Parker, but I didn’t play the entire quote in hopes that I kind of disguised it a little bit. I wasn’t thinking about it, but when I listen back to it, that is what I hear. The quote from “Cool Blues” by Charlie Parker. “

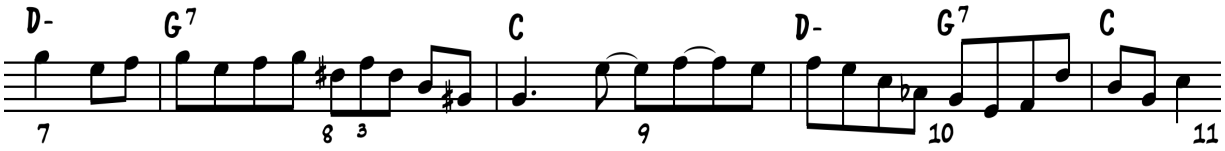

Figure 22. Goines comment 3, m. 7-11.

Comment 4 - SCALE “Again that’s that Mixolydian/Lydian kind of something I’m doing, but I employed it inside of a major augmented fifth chord. And that’s taking place over the two chord in “Take the ‘A’ Train” because it has a sharp 11 in it.”

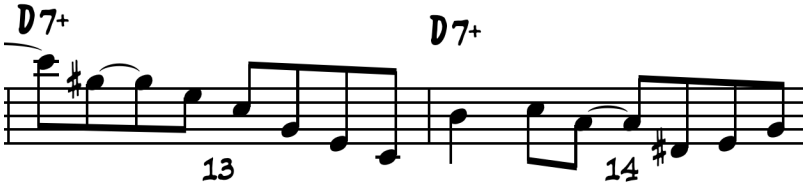

Figure 23. Goines comment 4, m. 13-14.

Comment 5 - SEQUENCE “That’s a little bit of a sequence taking place there. I mean I didn’t quite use the entire sequence of what I could have done, but that was part of a sequence.”

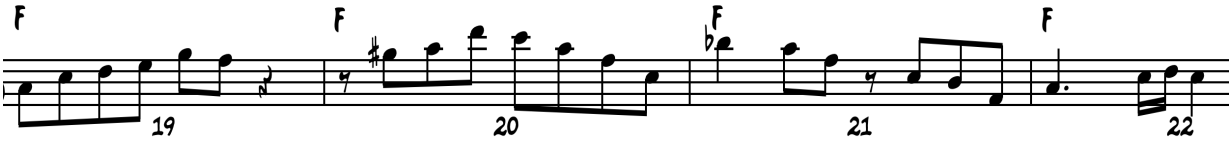

Figure 24. Goines comment 5, m. 19-22.

Comment 6 - SEQUENCE, CHORD “That’s definitely sequencing right there. The dominant 7th chord to a minor 7th chord.”

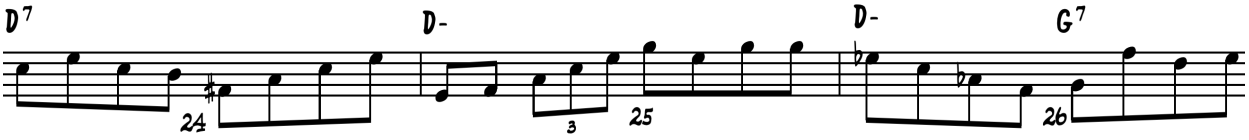

Figure 25. Goines comment 6, m. 24-26.

Comment 7 - RANGE/INTENSITY “I wanted the intensity of the sound to come through a held note, because we don’t always have to play intensity by playing lots of notes. We can play longer notes and still be intensified.”

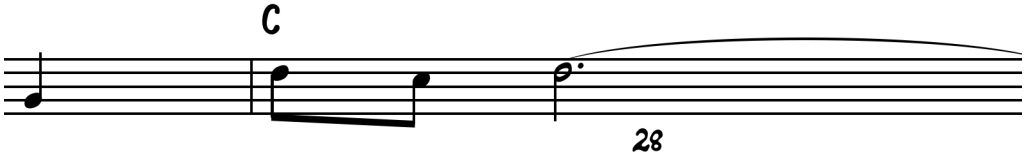

Figure 26. Goines comment 7, m. 28.

Comment 8 - MELODIC VARIATION “A little quote of “Take the ‘A’ Train,” but I didn’t finish it.”

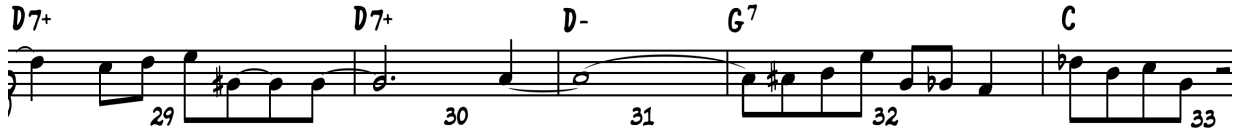

Figure 27. Goines comment 8, m. 29-33.

Comment 9 - RANGE/INTENSITY “Repetition of a phrase there to create intensity.”

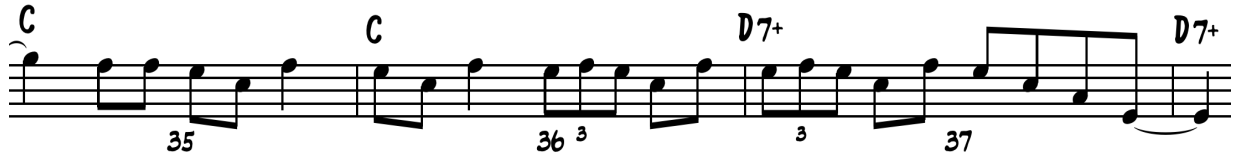

Figure 28. Goines comment 9, m. 35-37.

Comment 10 – SEQUENCE, SCALE “So that’s sequencing, as well as scale motion going upward. And then ultimately I had a sequencing motion that took place descending along the line.”

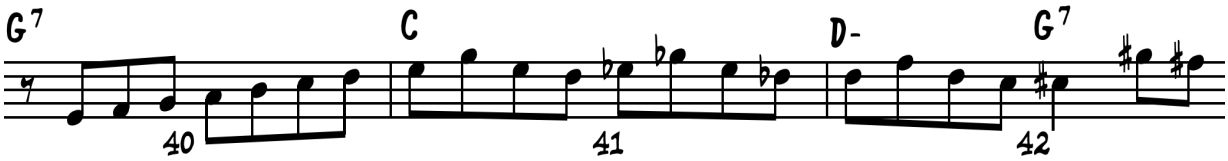

Figure 29. Goines comment 10, m. 40-42.

Comment 11 - RANGE “I used range to go from the lower part of my horn all the way to the top. In my solo I try to make sure I expose the whole tessitura of my saxophone.”

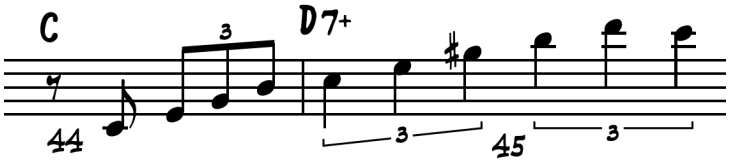

Figure 30. Goines comment 11, m. 44-45.

Comment 12 – LICK, CHORD “That was a quote that Sonny Stitt uses a lot, but instead of playing it literally, I also use it to resolve to the four chord of the bridge.”

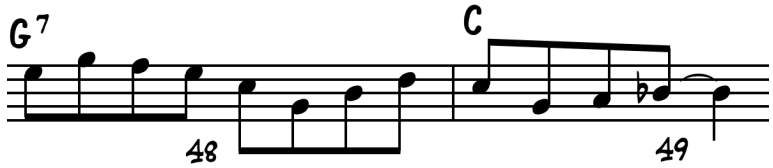

Figure 31. Goines comment 12, m. 48-49.

Comment 13 – SEQUENCE, CHORD “So I used a half step kind of sequence going on inside of the triads to try to play something more simple. But at the same time I let the complexity come out through the simplicity of the melody, or the chord structure. So it’s kind of like using a chord at the same time, but arpeggiating it by using lower neighbors to ornament it a little bit.”

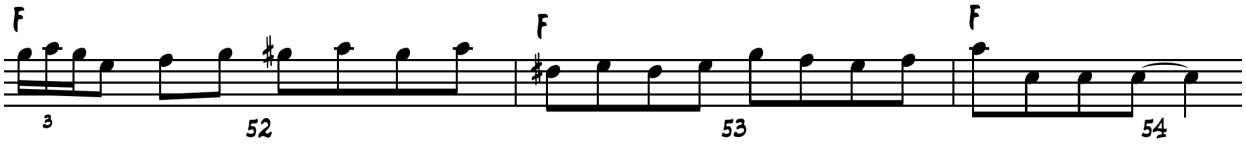

Figure 32. Goines comment 13, m. 52-54.

Comment 14 – SEQUENCE, CHORD “Ok that was sequencing right there, but I didn’t quite get the sequence that I wanted. So that’s one thing that happens in jazz. We try to make sure that we listen organically. We’re not trying to play things that are memorized all the time. We want to really play the music. When you play something you don’t necessarily want to play, or it doesn’t come out exactly how you wanted, you have to figure out how to take that and make it a part of your expression. And as the saying goes, ‘if you have a lemon, you make lemonade’. So you take something that may not be exactly what you wanted, you were hearing it, but it didn’t come out exactly the way you wanted, so you try to figure out how to get the most mileage out of it nonetheless. So it was sequencing, but it was a sequence that I didn’t intend to do. I tried to figure out how I was going to work my way out of that one to ultimately resolve to the I chord of the last A section.”

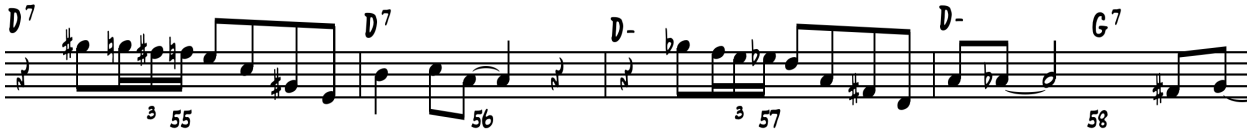

Figure 33. Goines comment 14, m. 55-58.

Comment 15 – SEQUENCE, RHYTHM “That’s just sequencing at the octave, using range and rhythmic variation as a part of the solo.”

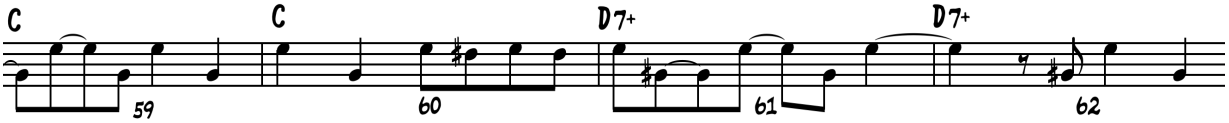

Figure 34. Goines comment 15, m. 59-62.

Comment 16 - LICK “And at the end of my solo I almost played that same melodic device I played earlier [Sonny Stitt lick]. But then I didn’t want to repeat myself, so I only played a little bit of it.”

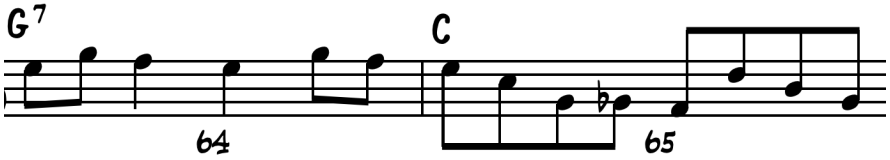

Figure 35. Goines comment 16, m. 64-65.

Comments Results

Twenty-one musical concept categories were coded from Goines comments, with a range of 0 to 6 for each musical concept category. “Other” was the only category that he did not select. Goines indicated sequence 6 times in his comments accounting for 28.6% of his total coded

categories. He was varied in the remaining categories he emphasized during his comments. He designated chord/arpeggio, memorized lick, scale/mode, and range/intensity 3 times each. These four concepts together accounted for 57.2% of his total coded categories. Table 8 compares Goines's frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 8

Goines' Coded Comments Data And Mean Coded Comments Data

Musical Concept	Goines Frequency	Mean Frequency	Goines %	Mean %
Chord/Arpeggio	4	3.86	18.2	21.1
Memorized Lick	3	3.14	13.6	17.2
Scale/Mode	3	2.86	13.6	15.6
Sequence	6	2.71	27.3	14.8
Range/Intensity	3	1.57	13.6	8.6
Rhythmic Emphasis	2	1.57	9.1	8.6
Other	0	1.57	0	8.6
Melodic Variation	1	1	4.6	5.5

Goines identified sequence 6 times, more than 3 occurrences over the average. This accounted for 28.6% of his total data, as opposed to the 14.8% average for sequence among all the participants. He also reported higher instances of range/intensity (3) than the mean among all participants (1.57). Goines's results for chord/arpeggio, memorized lick, scale/mode, rhythmic emphasis, and melodic variation were similar to the averages with the greatest difference being less than one instance. None of his comments were coded as "other", 1.57 occurrences less than the average. The "other" category accounted for 8.6% of the total among all the participants.

Comparison of Categorical Analysis Results and Coded Comments Results

Goines's categorical analysis results and coded comments results were similar for 6 of the 8 categories. The differences between self-analysis selections and coded comments for melodic variation, chord/arpeggio, memorized lick, sequence, range/intensity, and "other" were all 1 or fewer. Goines selected scale/mode 5 times during the categorical analysis, but only made 3 comments that were coded as scale/mode. He also selected rhythmic emphasis 5 times during the self-analysis, but only made 2 comments coded as rhythmic emphasis. Table 9 compares the frequency of occurrences for musical concept categories in his categorical analysis and the coded comments analysis.

Table 9

Goines's Frequency Of Occurrences For Categorical Analysis And Coded Comments

Musical Concept	SCRIBE Frequency	Comments Frequency	+/-
Melodic Variation	2	1	-1
Scale	5	3	-2
Chord	2	3	+1
Lick	3	3	0
Rhythm	5	2	-3
Sequence	5	6	+1
Range	2	3	+1
Other	0	0	0

Goines Questionnaire Summary

Goines studied improvisation in a private studio and took classes in improvisation. He

cited “general musicianship and learning the language of jazz” as concepts that were emphasized in the lessons and classes. “Melodic development” was the concept that Goines emphasized in his early improvisations and continues to emphasize today.

Dr. Geoffrey Haydon

Categorical Analysis Results

Haydon identified 27 categories in the analysis of his improvised solo, with a range of 0 to 6 instances for each musical concept category. The “other” category was the only one not selected by Haydon. Memorized lick and rhythmic emphasis were selected most often (6), each accounting for 22.2% of his categorical analysis results. Table 10 compares Haydon’s frequency counts and percentages for each category, and the average frequency and mean percentage for all participants.

Table 10

Haydon's Categorical Analysis Data And Mean Categorical Analysis Data

Musical Concept	Haydon Frequency	Mean Frequency	Haydon %	Mean %
Melodic Variation	5	2.6	18.5	12.9
Scale/Mode	1	3.4	3.7	17.3
Chord/Arpeggio	5	2.7	18.5	13.7
Memorized Lick	6	4.4	22.2	22.3
Rhythmic Emphasis	6	1.7	22.2	8.6
Sequence	1	3.1	3.7	15.8
Range/Intensity	3	1.4	11.1	7.2
Other	0	0.4	0	2.2

Haydon selected rhythmic emphasis (6) 4 times more than the average (1.7) of all participants. This accounted for 22.2% of his total data as opposed to the 8.6% average for rhythm among the other participants. He also reported higher instances of melodic variation (5), chord/arpeggio (6), and range/intensity (3) than the averages (2.6, 2.7, and 1.4 respectively). However, Haydon had a higher overall number of categories selected in his categorical analysis. As a result the total percentages for these categories were similar to the average among the participants. His results for memorized lick (22.2%) and "other" (0%) were similar to the averages (22.3% and 2.2%). Haydon reported fewer instances of scale/mode (1) and sequence (1) than the averages (3.4 and 3.1). These concepts accounted for only 3.7% of the total number of categories selected, as opposed to 17.3% (SM) and 15.8% (SE).

Haydon's Comments

Comment 1 - CHORD "Yeah so I started with an arpeggiated figure."

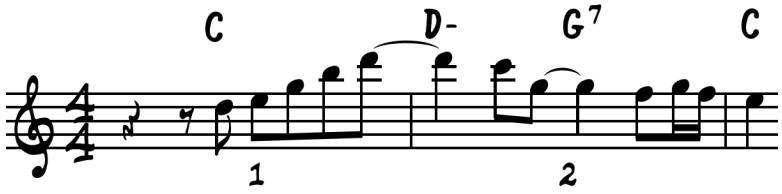

Figure 36. Haydon comment 1, m. 1-2.

Comment 2 - LICK "That's kind of a blues lick."

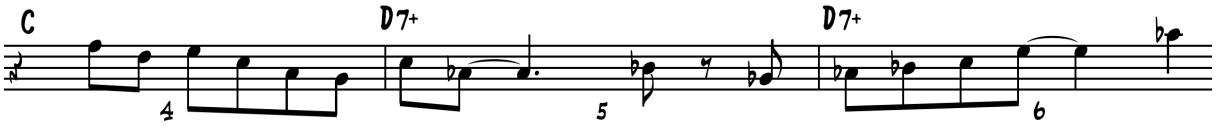

Figure 37. Haydon comment 2, m. 4-6.

Comment 3 - SCALE chromatic

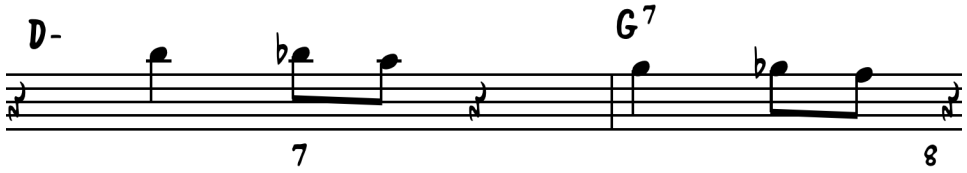

Figure 38. Haydon comment 3, m. 7-8.

Comment 4 - CHORD “Arpeggiating a little bit with chromaticism.”

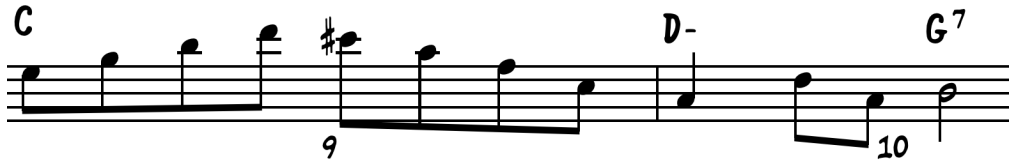

Figure 39. Haydon comment 4, m. 9-10.

Comment 5 - CHORD “Those are chord tones.”

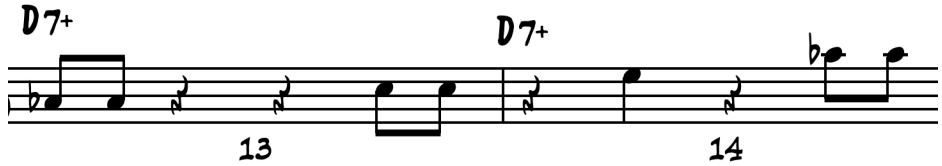

Figure 40. Haydon comment 5, m. 13-14.

Comment 6 - LICK “There’s a lick that I know.”

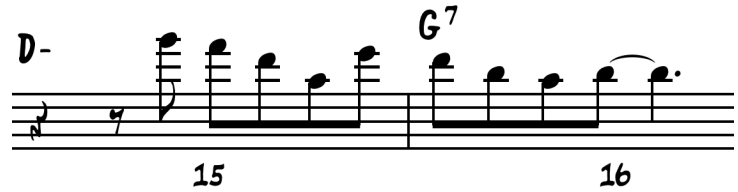

Figure 41. Haydon comment 6, m. 15-16.

Comment 7 - LICK “There’s another one.”

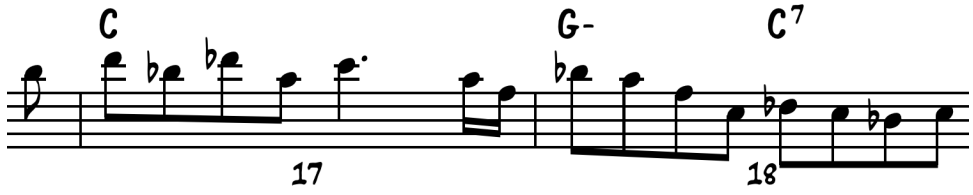

Figure 42. Haydon comment 7, m. 17-18.

Comment 8 - RHYTHM “It’s more rhythmic there.”

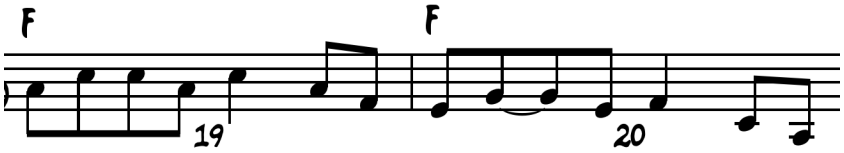

Figure 43. Haydon comment 8, m. 19-20.

Comment 9 - CHORD “There’s more chord based chromaticism.”

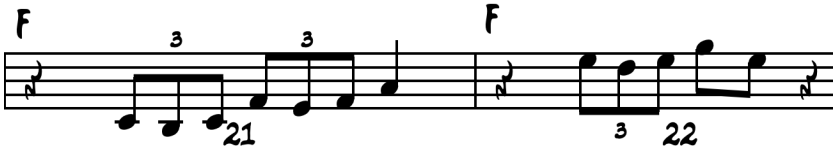

Figure 44. Haydon comment 9, m. 21-22.

Comment 10 - CHORD “There’s a tri tone sub there.”

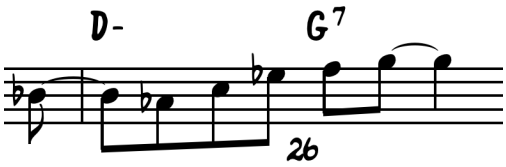

Figure 45. Haydon comment 10, m. 26.

Comment 11 - OTHER (ornamentation) “That was a surround thing I just did a second ago.”

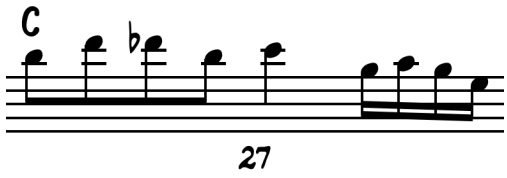

Figure 46. Haydon comment 11, m. 27.

Comment 12 - SCALE “There’s more scale oriented.”

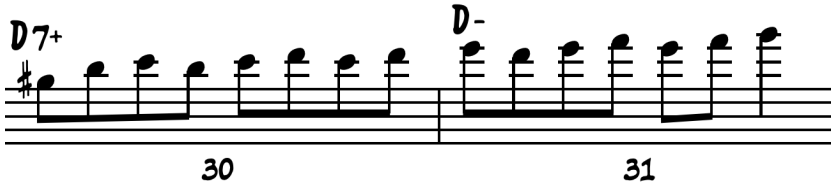

Figure 47. Haydon comment 12, m. 30-31.

Comment 13 - LICK “That’s a lick I know.”

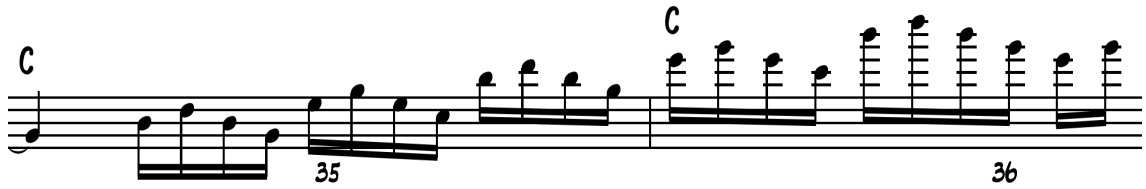

Figure 48. Haydon comment 13, m. 35-36.

Comment 14 - SCALE “There’s a whole tone thing there.”

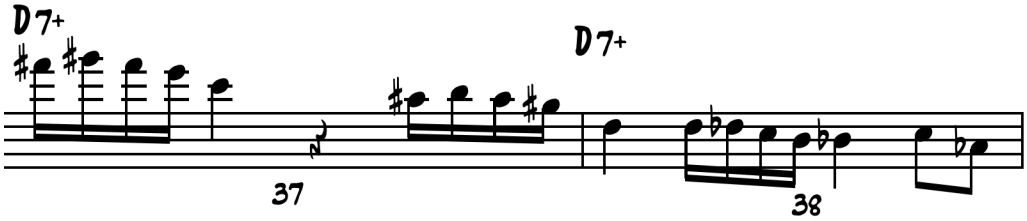

Figure 49. Haydon comment 14, m. 37-38.

Comment 15 - RHYTHM “Kind of a rhythm thing there.”

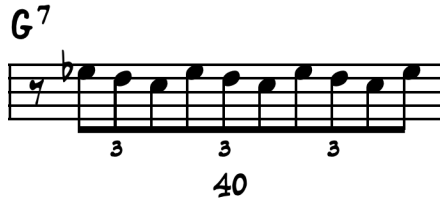

Figure 50. Haydon comment 15, m. 40.

Comment 16 - LICK “blues lick”

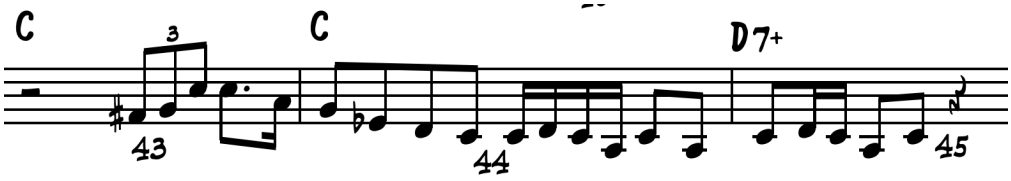

Figure 51. Haydon comment 16, m. 43-45.

Comment 17 – SCALE, SEQUENCE “Whole tone, and then a little bit of sequencing there.”

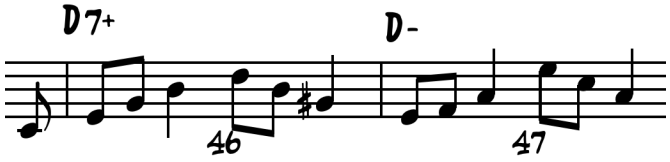

Figure 52. Haydon comment 17, m.46-47.

Comment 18 - SEQUENCE “That’s definitely sequencing.”

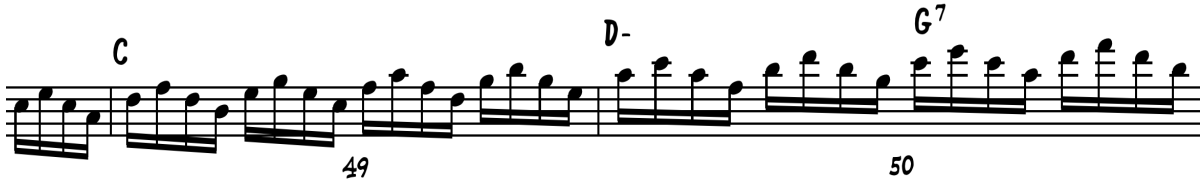

Figure 53. Haydon comment 18, m. 49-50.

Comment 19 - RANGE “I’m using range now. I guess I got bored with the middle range so I went up.”

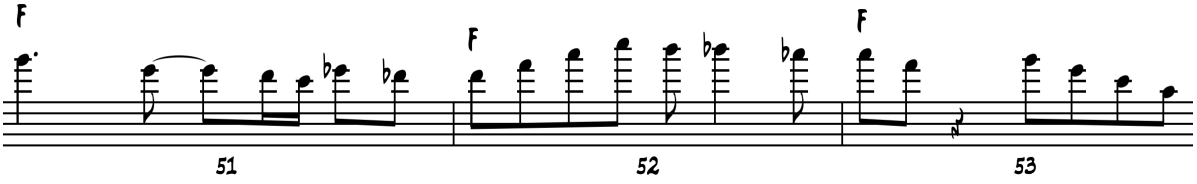

Figure 54. Haydon comment 19, m. 51-53.

Comment 20 - RHYTHM “A little rhythmic displacement there.”

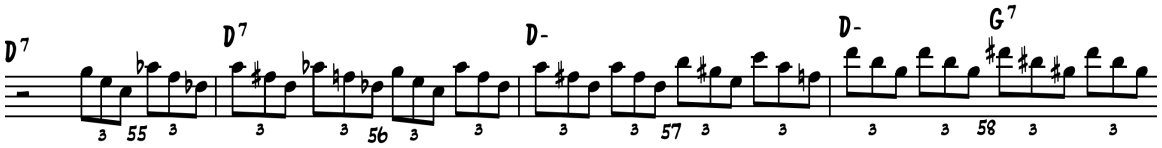

Figure 55. Haydon comment 20, m. 55-58.

Comment 21 - RHYTHM “Right there too.”

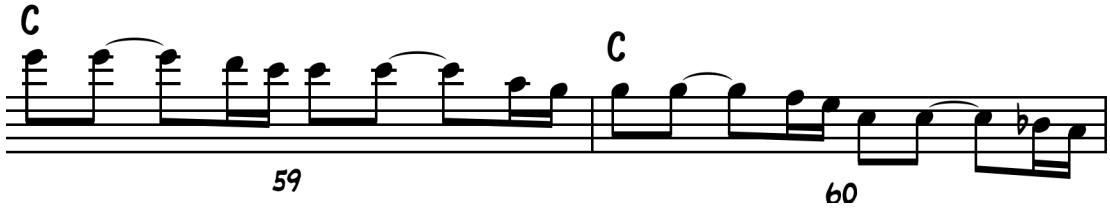

Figure 56. Haydon comment 21, m. 59-60.

Comment 22 - CHORD “That’s a tri tone sub arpeggio.”

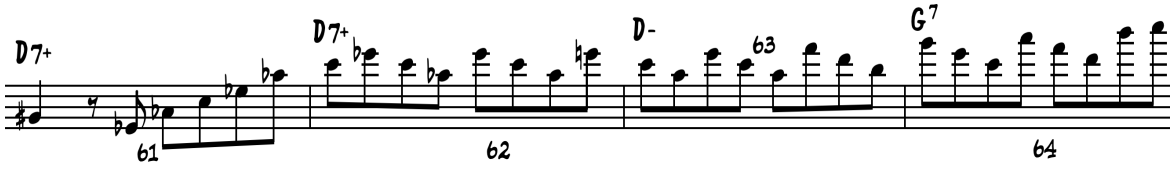

Figure 57. Haydon comment 22, m. 61-64.

Comment 23 - RHYTHM “That’s rhythmic displacement too.”

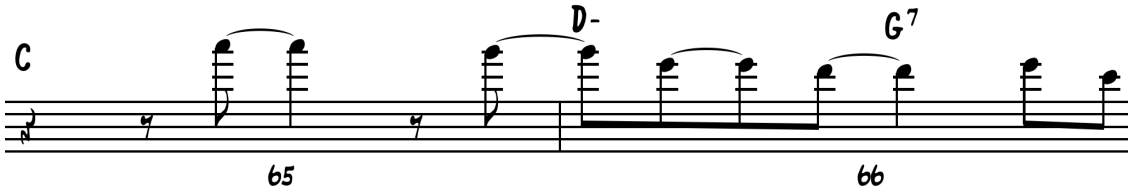

Figure 58. Haydon comment 23, m. 65-66.

Summary of Comments

Twenty-four musical concept categories were coded from Haydon’s comments, with a range of 0 to 6 for each category. Haydon did not mention any instances of melodic variation in his comments. He mentioned chord/arpeggio most often, accounting for 25% of his total coded categories. Table 11 compares Haydon’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 11

Haydon's Coded Comments Data And Mean Coded Comments Data

Musical Concept	Haydon Frequency	Mean Frequency	Haydon %	Mean %
Chord/Arpeggio	6	3.86	25	21.1
Memorized Lick	5	3.14	20.8	17.2
Scale/Mode	4	2.86	16.7	15.6
Sequence	2	2.71	8.3	14.8
Range/Intensity	1	1.57	4.1	8.6
Rhythmic Emphasis	5	1.57	20.8	8.6
Other	1	1.57	4.1	8.6
Melodic Variation	0	1	0	5.5

Haydon identified rhythmic emphasis 5 times, more than 3 occurrences over the average. This accounted for 20.8% of his total coded comments, as opposed to the 8.6% average for rhythmic emphasis among the participants. Haydon had higher occurrences of chord/arpeggio (6) and memorized lick (5) than average coded comments results (3.86, 3.14), however, he had a higher total number of coded comments than the average among the participants. This resulted in similar total percentages for chord/arpeggio (25%) and memorized lick (20.8%) when compared to the means for these categories (21.1% and 17.2%). Haydon's coded comments results for scale/mode, sequence, range/intensity, and "other" were similar to the mean of the participants, with the greatest difference being 1.14 occurrences. His total percentage of coded comments for sequence (8.3%) was noticeably less than the average (14.8%). He did not mention an example of melodic variation within his comments, 1 occurrence less than the average. Melodic variation only accounted for 5.5% of the total number of coded categories among the performers.

Comparison of Categorical Analysis Results and Coded Comments Results

Haydon's categorical analysis results and coded comments results were similar for 5 of the 8 categories. The difference between self-analysis selections and coded comments for chord/arpeggio, memorized lick, rhythmic emphasis, sequence, and "other" were all 1 or fewer. Haydon selected melodic variation 5 times in his self-analyses, but did not mention an instance within his comments. He also selected range/intensity 3 times during the self-analysis, but only made range/intensity 1 comment. He discussed examples of the scale/mode category 4 times during his comments, but only selected it 1 time during the self-analysis. Table 12 compares the frequency of occurrences for musical concept categories in his self-analysis and the coded comments.

Table 12

Haydon's Frequency Of Occurrences For Categorical Analysis And Coded Comments

Musical Concept	SCRIBE Frequency	Comments Frequency	+/-
Melodic Variation	5	0	-5
Scale	1	4	+3
Chord	5	6	+1
Lick	6	5	-1
Rhythm	6	5	-1
Sequence	1	2	+1
Range	3	1	-2
Other	0	1	+1

Haydon Questionnaire Summary

Haydon studied improvisation in a private studio and took classes in improvisation. He listed learning scales, arpeggios, and ii V I progressions as concepts that were emphasized in the lessons and classes. Haydon cites “choosing right notes and the blues scale” as concepts he emphasized in his early improvised solos. When asked what concepts he felt he emphasized in his current playing he wrote “getting deeper in musical concepts such as scales (beyond diatonics) and chord substitutions.” He listed “learning the history of jazz, listening to great players, attending jazz clinics, playing gigs” as influences of the change in emphasis from early improvisation efforts.

Dr. Lawrence Panella

Categorical Analysis Results

Panella selected 20 instances in his improvisation that he categorized in his analysis, with a range of 0 to 10 moments for each musical concept. ‘Chord/arpeggio’ was the only category that he did not select. Panella selected ‘memorized lick’ 10 times during his categorical analysis observation, accounting for 50% of his total self-analysis data. He did not select the chord/arpeggio category during his categorical analysis. Table 13 compares Panella’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 13

Panella's Categorical Analysis Data And Mean Categorical Analysis Data

Musical Concept	Panella Frequency	Mean Frequency	Panella %	Mean %
Melodic Variation	1	2.6	5	12.9
Scale/Mode	3	3.4	15	17.3
Chord/Arpeggio	0	2.7	0	13.7
Memorized Lick	10	4.4	50	22.3
Rhythmic Emphasis	1	1.7	5	8.6
Sequence	1	3.1	5	15.8
Range/Intensity	1	1.4	5	7.2
Other	3	0.4	15	2.2

Panella identified memorized lick (10), more than 5 occurrences over the average of the participants (4.4). This accounted for 50% of his total data, as opposed to the 22.3% average for memorized lick among the other participants. He was the only participant to select “other” (3) in

his categorical analyses. It accounted for 15% of the total number of selected categories as opposed to the 2.2% average among the performers. His results for scale/mode (3), rhythmic emphasis (1), and range/intensity (1) results were similar to the averages with the greatest difference being less than one occurrence. Panella reported fewer instances of melodic variation and sequence (1), than the mean (2.6 and 3.1). These concepts accounted for only 5% of the total number of categories, as opposed to 12.9% (MV) and 15.8% (SE). He did not select an instance of chord/arpeggio within his categorical analysis, 2.7 occurrences fewer than the average. It accounted for 13.7% of the total categorical analysis data among the performers.

Panella's Comments

Comment 1 - OTHER (motivic development) “I’m big on motivic development in this instance. I learned to talk with my horn, so it’s a combination of things I would classify as “other”, because it’s not melodic material, it’s not a lick necessarily, and it’s not necessarily a sequence. I’m always trying to sing what I play, and play what I sing. I sing memorized material the same way I would speak a familiar phrase, but it still has meaning for me. They’re not necessarily the brain shutting off. I’m still speaking thoughtfully.”

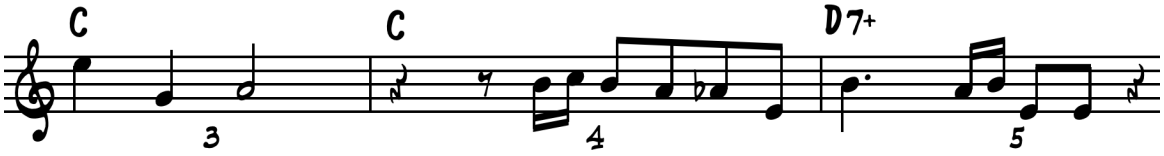

Figure 59. Panella comment 1, m. 3-5.

Comment 2 - LICK, CHORD, SEQUENCE “That turn around right there I think I’ve probably used that a lot. It’s a turn around sequence with some flatted ninths.”

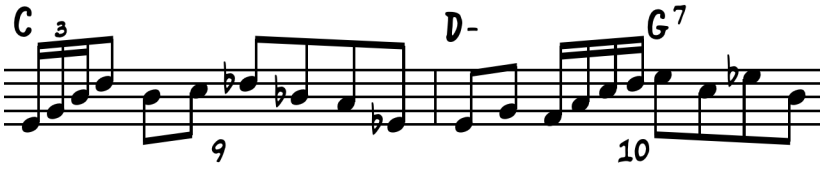

Figure 60. Panella comment 2, m. 9-10.

Comment 3 - CHORD “In that instance there when I get to chords, particularly augmented chords, augmented major 7’s, I tend to become more theory oriented. I do have vocabulary. I do know the lay of the land on my instrument, but at that point I’m trying to make sure that I’m outlining that harmony. Whereas in other instances if it’s ii V I’s, turn around cycles, I’m not thinking very much at all about the actual harmony. But on a tune like this when I’ve got that augmented, some people play it as an augmented dominant seventh or a dominant seven flat five, I’m trying to bring that quality out at that point. So it tends to be a little bit of a gear change for me where the theory aspect of things will kick in.”

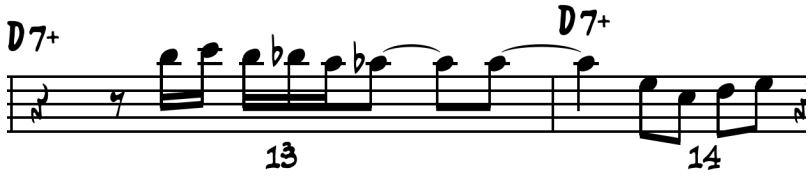

Figure 61. Panella comment 3, m. 13-14.

Comment 4 - OTHER (motivic development) “That first idea is sort of a meaningless idea, but the repetition of it sort of gives it emphasis and eventually gives it meaning, and so you repeat it. It’s like the storytellers rules of three. You know, three little pigs? At the third instance of the occurrence the story changes. So I use that device when I play sometimes. I’ll play an idea and try and approach it from the standpoint that nothing is ever wasted. That the dumbest idea, even a wrong note, if played again and again and worked through will actually turn out to be a much more creative and interesting part of the story. As opposed to playing something (sings) and abandoning it. I try to emphasize that with my students. Take simple ideas and build upon them, and thereby engage listeners in that regard, taking them along to figure out what he’s going to do with the idea.”

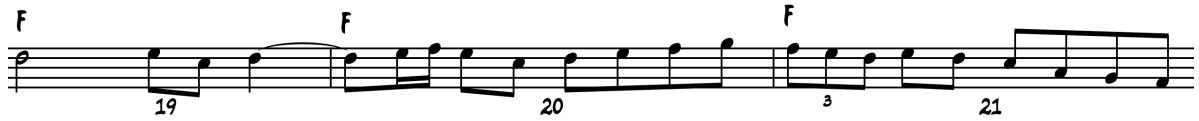

Figure 62. Panella comment 4, m. 19-21.

Comment 5 - SCALE “That’s a theory thing right there, because I’m putting a sharp 11 in that dominant, and I think if I’m not mistaken it’s either a flat 5, it might have a sharp 5 in it, but I’m trying to bring out that sort of altered dominant sound.”

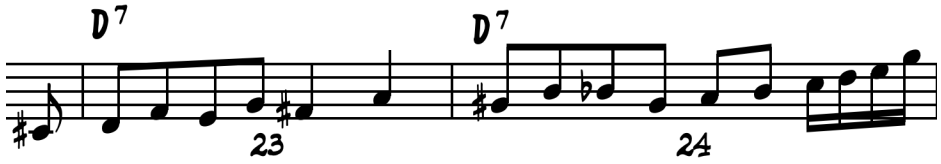

Figure 63. Panella comment 5, m. 23-24.

Comment 6 - MELODIC VARIATION “That’s a melodic variation.”

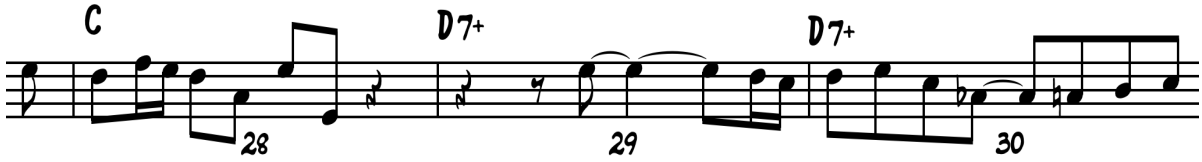

Figure 64. Panella comment 6, m. 28-30.

Comment 7 - LICK “That (sings lick) occurs several times, and that goes back to my roots. My first improvisation experiences were learning how to play the blues, so I tend to be a more blues oriented player. One of the first players I latched onto as a listener and as a saxophone student was Jean Hammonds. Jean being part of that soul, bop, hard-bop kind of thing, even though he did have roots going back further than that, he used a lot of blues licks. Cannonball Adderley is another one of my favorite saxophone players who sometimes did so gratuitously, and I’m infected. What can I say?”

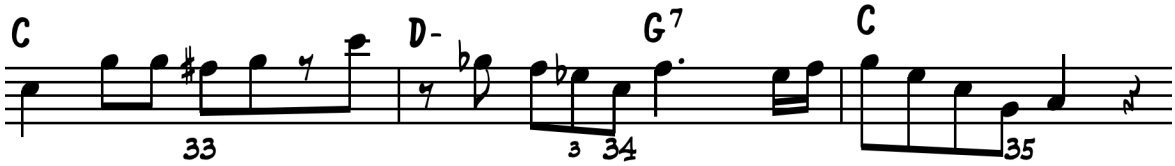

Figure 65. Panella comment 7, m. 33-35.

Comment 8 - LICK “I used that blues idea again.”

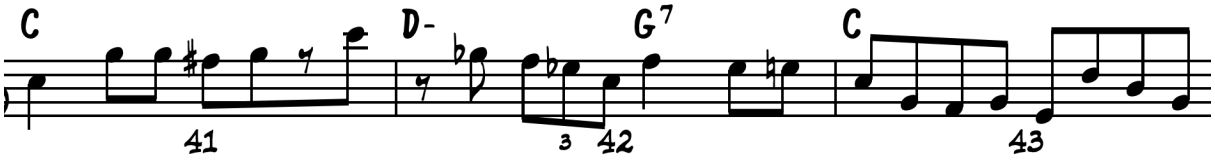

Figure 66. Panella comment 8, m. 41-43.

Comment 9 – RANGE/INTENSITY “Some range to build excitement.”

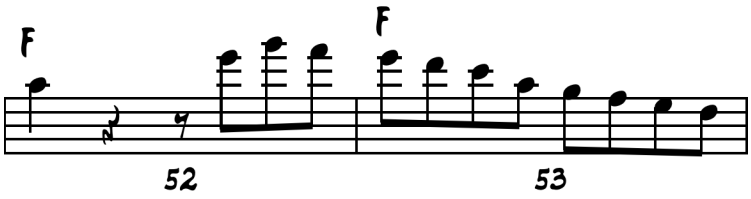

Figure 67. Panella comment 9, m. 52-53.

Comment 10 - SCALE “There I’m altering the turnaround a little bit, usually using tri-tone substitutions. Nothing earth shattering there.”

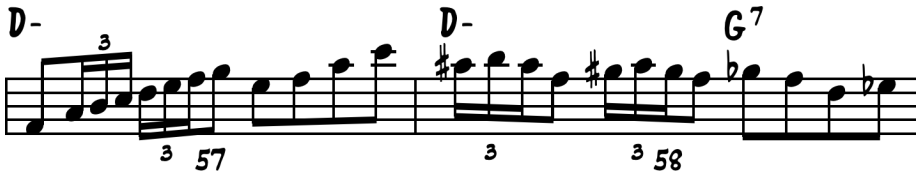

Figure 68. Panella comment 10, m. 57-58.

Comment 11 - OTHER (motivic development) “The reuse of ideas is something that to me helps tie a solo together. One of my teachers was Rich Madison, a great jazz euphonium player, and he always talked to us about telling stories, and about playing to someone in the audience. So I try to make sure in my playing that I’m playing to people and not at them. It doesn’t mean necessarily that I’m trying to play dumbed down stuff, but I’m always trying to carry them with me. Whether I’m doing an original tune or that kind of thing [Take the ‘A’ Train], I do my best to use motivic development to carry the ideas through so that the audience follows along with what I’m doing.”

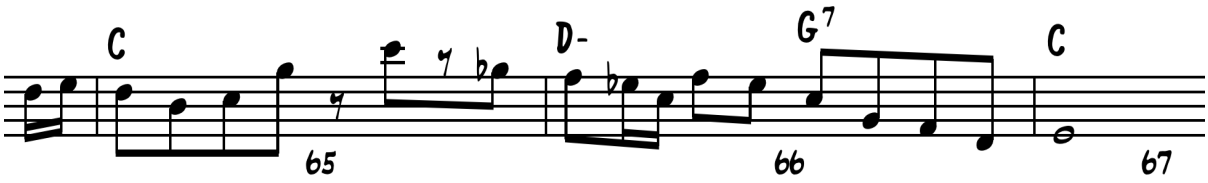

Figure 69. Panella comment 11, m. 65-67.

Summary of Comments

Thirteen musical concept categories were coded from Panella’s improvisation comments, with a range of 0 to 3 for each category. He did not mention an instance of rhythmic emphasis in his comments. Panella was varied in the categories that he discussed. Memorized lick, and “other” were mentioned most often (3), accounting for 46.1% of his total coded categories. Table 14 compares Panella’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 14

Panella Coded Comments Data And Mean Coded Comments Data

Musical Concept	Panella Frequency	Mean Frequency	Panella %	Mean %
Chord/Arpeggio	2	3.86	15.4	21.1
Memorized Lick	3	3.14	23.1	17.2
Scale/Mode	2	2.86	15.4	15.6
Sequence	1	2.71	7.7	14.8
Range/Intensity	1	1.57	7.7	8.6
Rhythmic Emphasis	0	1.57	0	8.6
Other	3	1.57	23.1	8.6
Melodic Variation	1	1	7.7	5.5

Panella made comments coded as “other” 3 times, almost double the average occurrences. This accounted for 23% of his total, as opposed to the 8.6% average among the participants. Panella’s comments results for 4 categories were similar to the average of all the participants. His frequency of coded comments for memorized lick, scale/mode, range/intensity, and melodic variation were all within .57 occurrences of the mean among the performers. He did not mention rhythmic emphasis within his comments, 1.57 occurrences less than the average. It accounted for 8.6% of the total number of categories coded among all the participants. Panella also mentioned fewer instances of sequence (1) than the mean (2.71). This accounted for 7.7% of the total number of coded concepts, as opposed to the 14.8% average among the performers. He also had fewer instances of the chord/arpeggio category (2) than the average (3.86). It accounted for 15.4% of his total comments as opposed to the 21.1% average among the participants.

Comparison of Categorical Analysis Results and Coded Comments Results

Panella's categorical analysis results and coded comments results were similar for 6 of the 8 categories. The difference between categorical analysis selections and coded comments for melodic variation, scale/mode, rhythmic emphasis, sequence, range, and "other" were all 1 or fewer. Panella selected memorized lick 10 times during the self-analysis, but only made 3 comments that were coded as memorized lick. He also mentioned comments coded as chord/arpeggio 2 times, but did not select chord/arpeggio during the categorical analysis. Table 15 compares the frequency of occurrences for musical concept categories in his categorical analysis and the coded comments analysis.

Table 15

Panella's Frequency Of Occurrences For Categorical Analysis And Coded Comments

Musical Concept	SCRIBE Frequency	Comments Frequency	+/-
Melodic Variation	1	1	0
Scale	3	2	-1
Chord	0	2	+2
Lick	10	3	-7
Rhythm	1	0	-1
Sequence	1	1	0
Range	1	1	0
Other	3	3	0

Panella Questionnaire Summary

Panella studied improvisation in a private studio and took classes in improvisation. He wrote “primarily scales, chords, theory, listening, and lifting solos by ear” as concepts emphasized in the lessons and classes. He cited “blues licks and inflection, trying to play all that I was hearing in my head” as concepts he emphasized in his early improvised solos. When asked if that emphasis had changed he wrote “somewhat – I don’t emphasize blues as much, but I am always trying to play what I hear in my head.” When asked who or what influenced that change, Panella wrote “I got tired of finding myself playing the same ideas, and worked on singing and playing and using my brain the same way in either instance.”

Dr. Don Parker

Categorical Analysis Results

Parker identified 24 instances in his improvisation that he categorized in his analysis, with a range of 0 to 7 moments for each musical category. He did not select instances of rhythmic emphasis or “other” during the categorical analysis. Parker identified scale/mode (7) most often, accounting for 29.2% of his self-analysis results. Table 16 compares Parker’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 16

Parker Categorical Analysis Data And Mean Categorical Analysis Data

Musical Concept	Parker Frequency	Mean Frequency	Parker %	Mean %
Melodic Variation	3	2.6	12.5	12.9
Scale/Mode	7	3.4	29.2	17.3
Chord/Arpeggio	5	2.7	20.8	13.7
Memorized Lick	4	4.4	16.7	22.3
Rhythmic Emphasis	0	1.7	0	8.6
Sequence	4	3.1	16.7	15.8
Range/Intensity	1	1.4	4.2	7.2
Other	0	0.4	0	2.2

Parker selected scale/mode 7 times, more than 3 occurrences over the mean. He also identified chord/arpeggio 5 times, more than 2 occurrences over the average (2.7). These categories accounted for 29.2% (SM) and 20.8% (CA) of his total data, as opposed to the 17.3% (SM) and 13.7% (CA) averages among the other participants. Much of Parker's categorical analysis was similar to the mean of the other performers. His results for melodic variation (3), sequence (3), range/intensity (1), and "other" (0) were all similar to the averages with the greatest difference being less than one occurrence. Parker reported lower instances of memorized lick (2) and rhythmic emphasis (0) than the mean (4.4 and 1.7). Memorized lick accounted for 16.7% of the total number of categories selected, as opposed to 22.3% average among the participants. Rhythmic emphasis accounted for 7.2% of the average.

Parker's Comments

Comment 1 - MELODIC VARIATION “O.K., I’m trying to emulate the melody.”

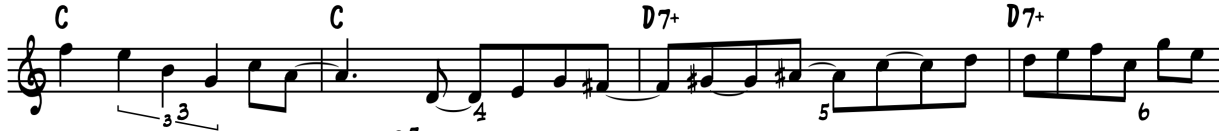

Figure 70. Parker comment 1, m. 3-4.

Comment 2 - SCALE “Going to the whole tone scale, moving up.”

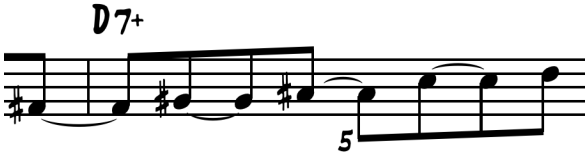

Figure 71. Parker comment 2, m. 5.

Comment 3 - LICK “Kind of a lickish.”

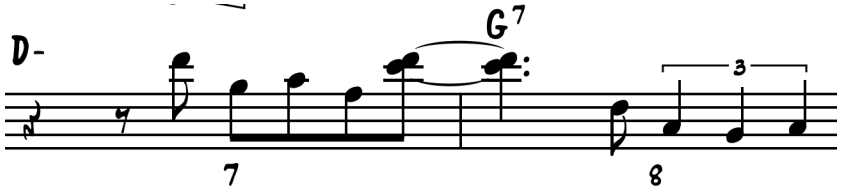

Figure 72. Parker comment 3, m. 7-8.

Comment 4 - LICK, SEQUENCE “That’s a lick. That’s a blues lick, somewhat. Sequencing it up.”

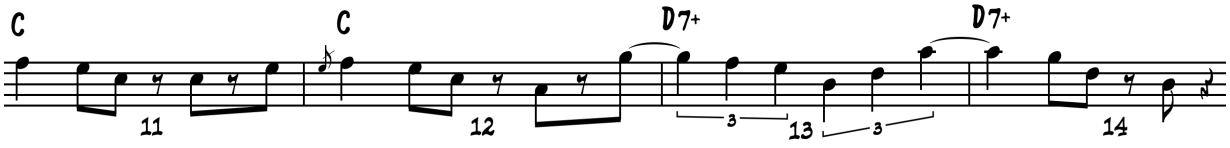

Figure 73. Parker comment 4, m. 11-14.

Comment 5 - RANGE “Using a little range.”

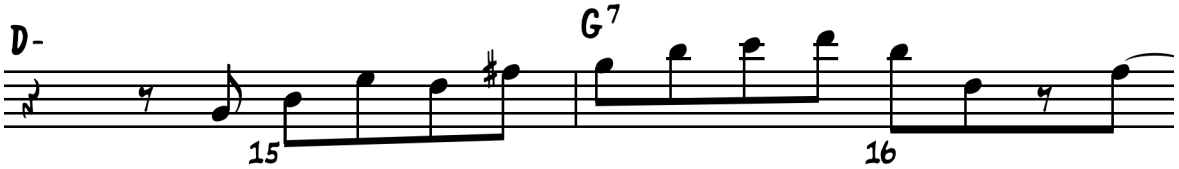

Figure 74. Parker comment 5, m. 15-16.

Comment 6 - CHORD “I’m looking for that leading tone. Going to the next chord change.”

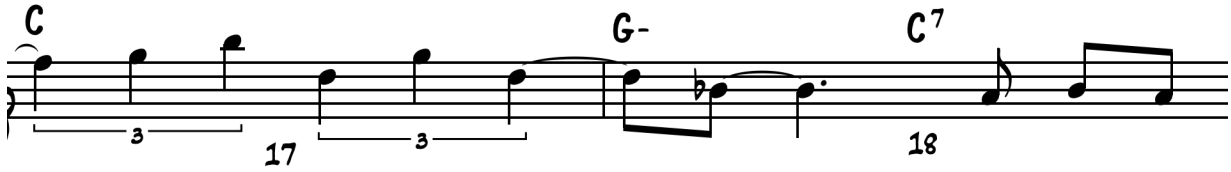

Figure 75. Parker comment 6, m. 17-18.

Comment 7 - SCALE “scale orientated”

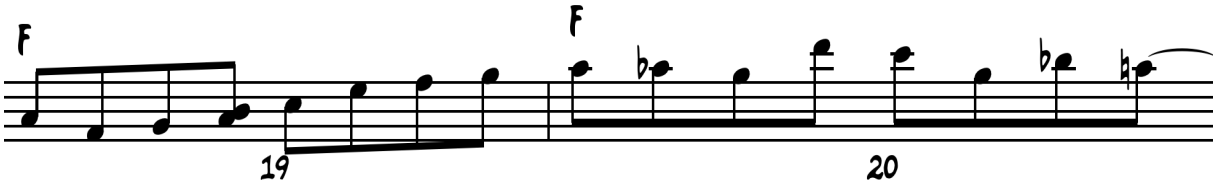

Figure 76. Parker comment 7, m. 19-20.

Comment 8 - CHORD “Staying in major.”

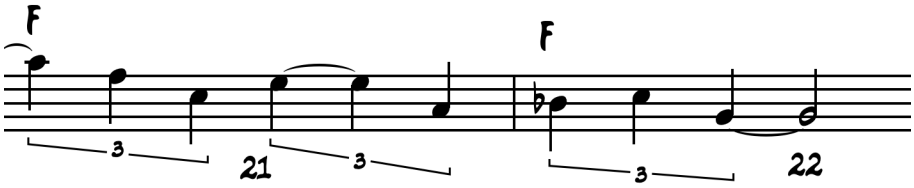

Figure 77. Parker comment 8, m. 21-22.

Comment 9 - SEQUENCE “Now sequence a little bit.”

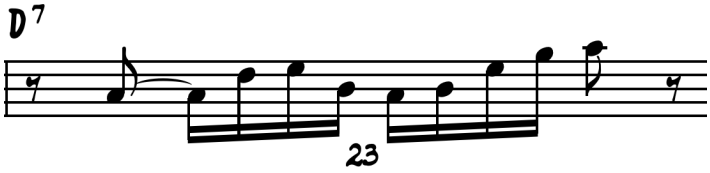

Figure 78. Parker comment 9, m. 23.

Comment 10 - CHORD “A little substitution, tri-tone sub going back to the chorus.”

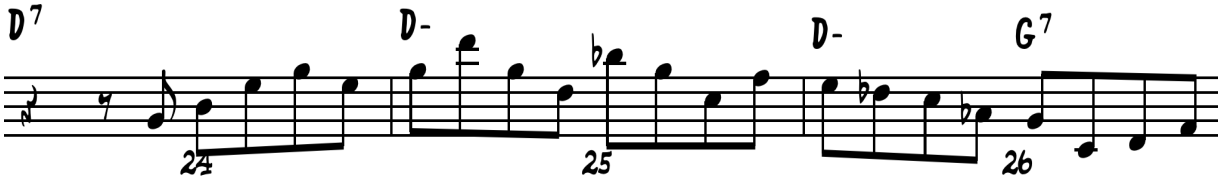

Figure 79. Parker comment 10, m. 24-26.

Comment 11 - SCALE “I’m definitely going back to the whole tone scale again.”

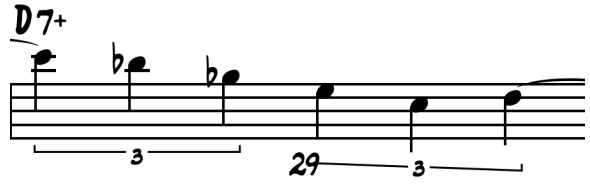

Figure 80. Parker comment 11, m. 29.

Comment 12 - SCALE, CHORD “Yeah, going up the scale, arpeggiating a little bit”

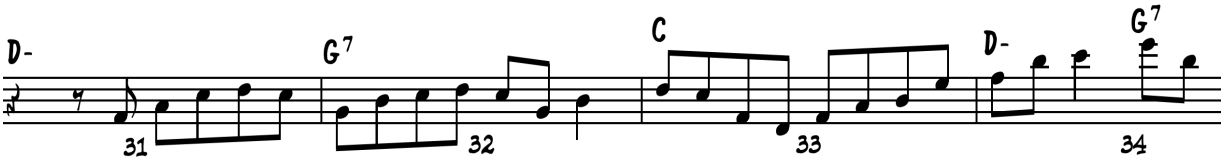

Figure 81. Parker comment 12, 31-34.

Comment 13 - MELDOIC VARIATION “Melody line coming down, a little melodic variation, kind of emulating the train idea.”

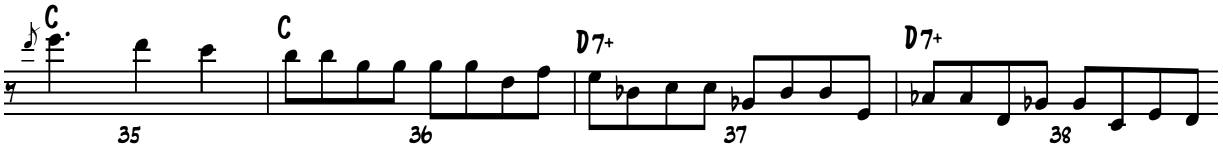

Figure 82. Parker comment 13, m. 35-38.

Comment 14 - SEQUENCE “Sequence up for interest.”

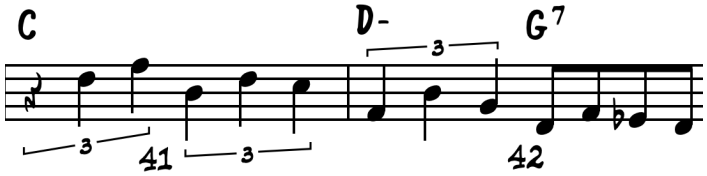

Figure 83. Parker comment 14, m. 41-42.

Comment 15 - LICK “Yeah, just a little lick.”

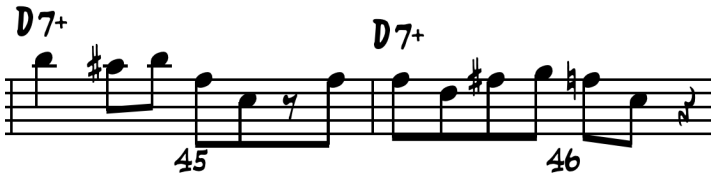

Figure 84. Parker comment 15, 45-46.

Comment 16 - CHORD “Arpeggiated figure moving up.”

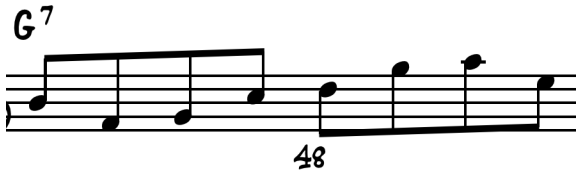

Figure 85. Parker comment 16, 48.

Comment 17 - CHORD “Coming back down to a leading tone…there it is.”

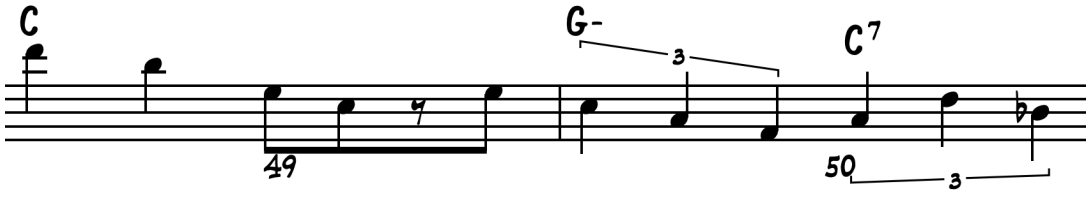

Figure 86. Parker comment 17, m. 49-50.

Comment 18 - SCALE “A scale figure, still in F major there.”

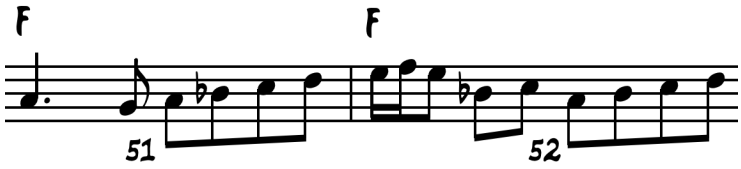

Figure 87. Parker comment 18, m. 51-52.

Comment 19 - CHORD “Changing, trying to lead up to that last little thing for a tri tone sub…there it is.

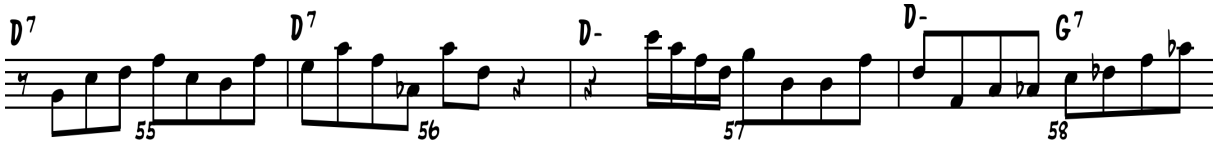

Figure 88. Parker comment 19, m. 55-58.

Comment 20 - SEQUENCE “Just a pattern. Some sort of sequential pattern in C.”

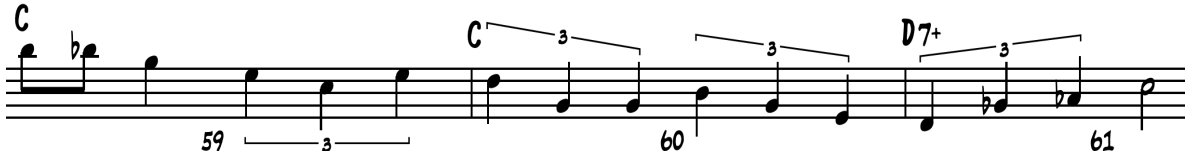

Figure 89. Parker comment 20, m. 59-61.

Comment 21 - CHORD, SCALE “Then I’m going to that tri tone sub to whole tone.”

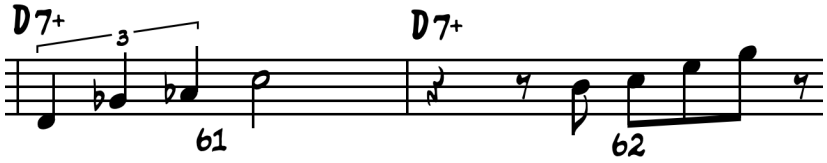

Figure 90. Parker comment 21, m. 62-64.

Comment 22 - LICK, RANGE “Lick, kind of a bluesy kind of lick, pretty basic, using some range too.”

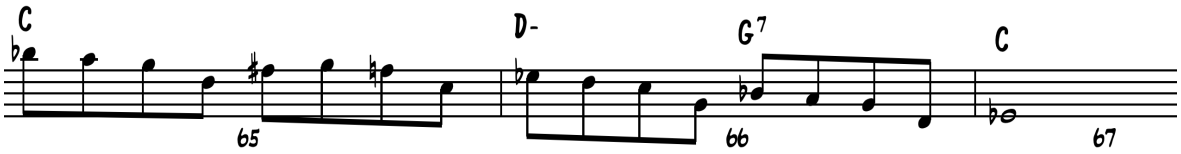

Figure 91. Parker comment 22, m. 65-67.

Summary of Comments

Twenty-six musical concept categories were coded from Parker’s comments, with a range of 0 to 8 for each category. Parker did not mention any instances of rhythmic emphasis or have comments coded as “other”. He discussed chord/arpeggio most often (8), accounting for 30.8% of his total coded categories. Table 17 compares Parker’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 17

Parker's Coded Comments Data And Mean Coded Comments Data

Musical Concept	Parker Frequency	Mean Frequency	Parker %	Mean %
Chord/Arpeggio	8	3.86	30.8	21.1
Memorized Lick	4	3.14	15.4	17.2
Scale/Mode	6	2.86	23.1	15.6
Sequence	4	2.71	15.4	14.8
Range/Intensity	2	1.57	7.7	8.6
Rhythmic Emphasis	0	1.57	0	8.6
Other	0	1.57	0	8.6
Melodic Variation	2	1	7.7	5.5

Parker identified chord/arpeggio 8 times, more than 4 occurrences over the average. This accounted for 30.8% of his total data, as opposed to the 21.1% average for chord/arpeggio among all the participants. He also identified scale/mode 6 times, more than 3 occurrences over the average. This accounted for 23.1% of his total data, as opposed to the 15.6% average for chord/arpeggio among all the participants. Parker's coded comments results for memorized lick, sequence, range/intensity, and melodic variation were similar to the average with the greatest difference being less than 1.29 instances. He did not mention rhythmic emphasis or any comments coded as "other", 1.57 occurrences less than the average for both. Rhythmic emphasis and the "other" category accounted for 8.6% of the mean among the participants.

Comparison of Categorical Analysis Results and Coded Comments Results

Parker's categorical analysis results and coded comments results were similar for 7 of the 8 categories. The differences between self-analysis selections and coded comments for melodic variation, scale/mode, memorized lick, rhythmic emphasis, sequence, range/intensity, and "other" were all 1 or fewer. Parker mentioned chord/arpeggio 8 times in his comments results, but only selected chord/arpeggio 5 times during his categorical analysis. Table 18 displays the frequency of occurrences for musical concept categories in his self-analysis and the coded comments analysis.

Table 18

Parker's Frequency Of Occurrences For Categorical Analysis And Coded Comments

Musical Concept	SCRIBE Frequency	Comments Frequency	+/-
Melodic Variation	3	2	-1
Scale	7	6	-1
Chord	5	8	3
Lick	4	4	0
Rhythm	0	0	0
Sequence	4	4	0
Range	1	2	1
Other	0	0	0

Parker Questionnaire Summary

Parker enrolled in classes for improvisation. He listed form, change running, ii V I progressions, blues scale/chord relationships, and rhythmic ideas as concepts emphasized in the

lessons and classes. He cited “lots of rhythmic ideas while making a musical idea grow and be important from a groove standpoint” as concepts he emphasized in his early improvised solos. When asked if that emphasis had changed he wrote, “I have a greater emphasis on substations and where the melody is.” When asked who or what influenced that change, Parker wrote, “listening to a bunch of players at various levels (Sunny Rollins, Chick Corea, Oscar Peterson, Milt Jackson, Herbie Hancock, etc. too many to name right now).”

Dr. David Spencer

Categorical Analysis Data

Spencer identified 18 instances in his improvisation that he categorized in his analysis, with a range of 0 to 5 moments for each musical category. He did not select instances of rhythmic emphasis or “other” during the categorical analysis. Spencer selected chord/arpeggio (5) most often, accounting for 27.8% of his self-analysis results. Table 19 compares Spencer’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 19

Spencer Categorical Analysis Data And Mean Categorical Analysis Data

Musical Concept	Spencer Frequency	Mean Frequency	Spencer %	Mean %
Melodic Variation	4	2.6	22.2	12.9
Scale/Mode	3	3.4	16.7	17.3
Chord/Arpeggio	5	2.7	27.8	13.7
Rhythmic Emphasis	0	1.7	0	8.6
Sequence	3	3.1	16.7	15.8
Range/Intensity	1	1.4	5.6	7.2
Other	0	0.4	0	2.2

Spencer selected chord/arpeggio 5 times, more than 2 occurrences over the mean. He also identified melodic variation 4 times, almost 2 occurrences over the mean. These categories accounted for 27.8% (CA) and 22.2% (MV) of his total data, as opposed to the 13.7% (CA) and 12.9% (MV) averages among the other participants. His results for scale/mode (3), sequence (3), range/intensity (1), and “other” (0) were similar to the average with the greatest difference being less than one occurrence. Spencer reported fewer instances of memorized lick (2) than the mean (4.4). Memorize lick accounted for 16.7% of the total number of categories that he selected, as opposed to the average of 22.3% among the performers. He did not select the rhythmic emphasis category, 1.7 occurrences fewer than the average. Rhythmic emphasis accounted for 8.6% of the total self-analysis categories.

Spencer's Comments

Comment 1 - OTHER (motivic development), SCALE “So I’m just trying to build a motivic idea (sings the motive), and just introducing the idea of a flat 9. You know because of those first two changes. I think modally because that’s how I was brought up at North Texas School of looking at things. So when I see changes I see chord/scale relationships immediately, so I’m trying to set up that dialogue between those first two changes of straight major versus the altered or super locrian actually.”

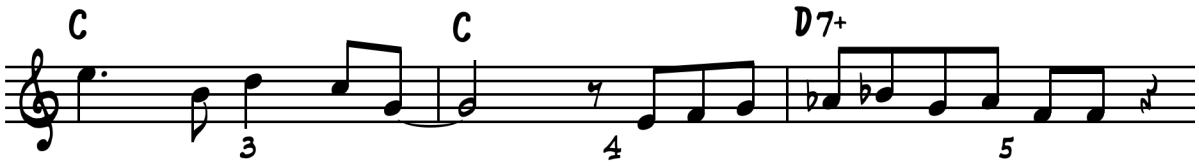

Figure 92. Spencer comment 1, m. 3-5.

Comment 2 - CHORD “So same again, I’m trying to reintroduce my Bb, you know that flat 9, using it also over the A7 there. So the idea that it’s in the E7 altered, and that I’m introducing it over the dominant chord. So I’m trying to establish that sound in the listener’s ear.”

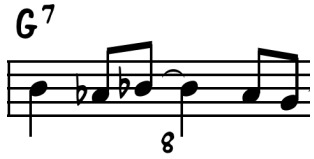

Figure 93. Spencer comment 2, m. 8.

Comment 3 - CHORD, LICK “I remember learning this tune when I was a freshman in college. I went through all these exercises. So the reason I asked you whether that was an arpeggiation or a lick is because it’s a straight arpeggiation. It’s just arpeggiating down. It’s basically the augmented triad of the major tonic chord, but it works over that [D]7 altered because it contains all the right notes. So I used to practice that over and over till I could really play super locrian. So it is an arpeggiation, but it’s also a lick that I just remember, and it helps me get coordinated leading to the [D] minor 7.”

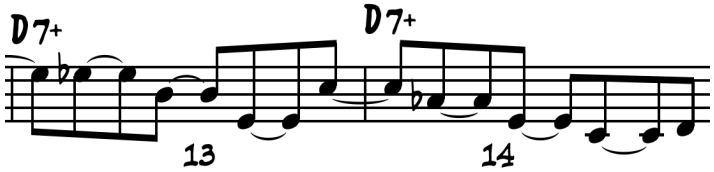

Figure 94. Spencer comment 3, m. 13-14.

Comment 4 - LICK “That’s funny cause (sings the lick) is really a straight Clifford Brown idea. Yeah it just seeps into your vocabulary after a while, after all those transcriptions. Interesting.”

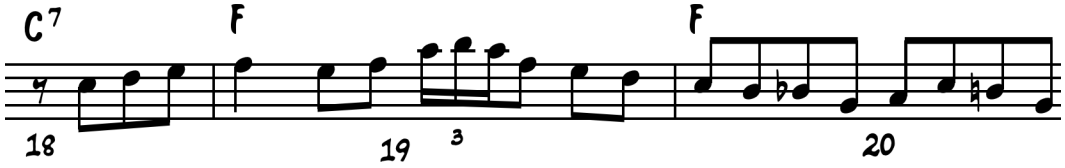

Figure 95. Spencer comment 4, m. 18-20.

Comment 5 - RHYTHM “I like off kilter rhythmic ideas as well that lead back to the tonic chord. So creating some rhythmic tension to get back to the one again.”

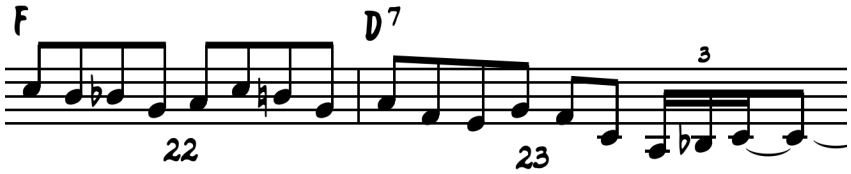

Figure 96. Spencer comment 5, m. 22-23.

Comment 6 - RHYTHM, CHORD, MELODIC VARIATION “That’s a combination of using both the tune, and making it into sort of a rhythmic variation. I’m piling up at that point, the last A, the ideas of the arpeggiation that I introduced early, the melody, a melodic variation in what I’m doing, and the harmonic ideas at the same time. That’s my attempt anyway.”

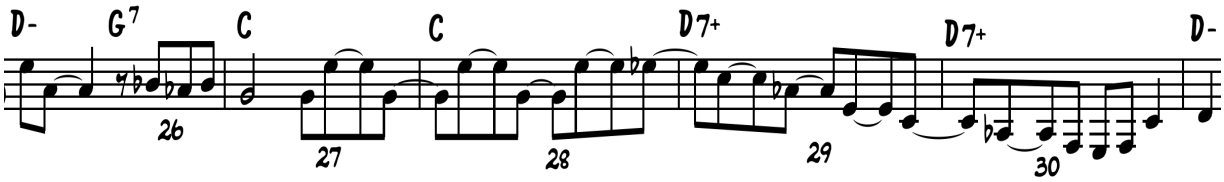

Figure 97. Spencer comment 6, m. 26-30.

Comment 7 – SEQUENCE, CHORD “Clearly a sequence. Choosing to use that augmented tonic chord over the second chord, because you’re basically dealing with a half step. It just makes an easy approach to a sequence.”

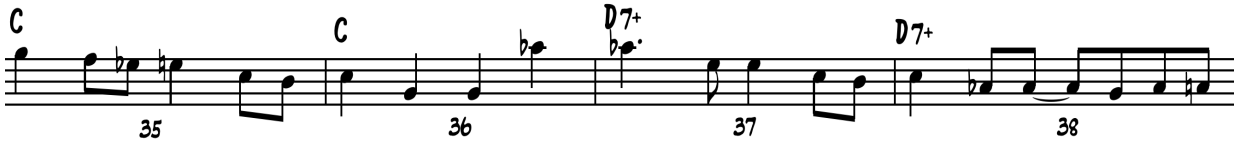

Figure 98. Spencer comment 7, m. 35-38.

Comment 8 - OTHER (phrasing) “But I don’t like the way I’m ending every phrase. I should have played through a few more phrases. I don’t know why I’m bringing all of the phrases to a conclusion, like a 4 bar phrase. I think it’s because we’re in an academic setting. I feel like I need to make sure the audience understands that that’s a phrase.”

Comment 9 - SEQUENCE, RHYTHM “So sequence and the rhythmic idea. I usually make that a little more complicated. I think it’s too early in the morning. Does the hour affect the outcome?”

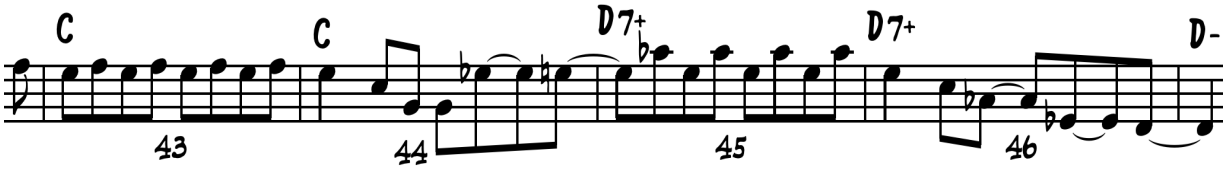

Figure 99. Spencer comment 9, m. 43-46.

Comment 10 - RANGE, LICK “I told you there I really wanted to play a [C]. I wanted to go (sings) an octave, which I guess then it would be considered a lick because I do that a lot in my solos, but then I was thinking about the fact that we’re in a hotel, so I went with the [A].”

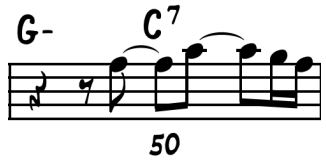

Figure 100. Spencer comment 10, m. 50

Comment 11 - OTHER (architecture) “Ok so that was my brain being like a 32nd note behind everything. I knew what I wanted to do, but I wasn’t quite sure. I was thinking well we’re ending the 2nd chorus, so I should bring things down. So I was actually fighting with myself not to keep building. I knew I only had four bars left to bring this thing to a close, so I thought oh God I better get down, bring the plane down.”

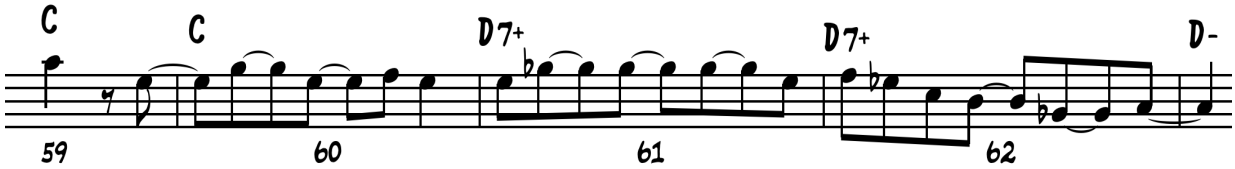

Figure 101. Spencer comment 11, m. 59-62.

Comment 12 - CHORD “I kind of ended where I began in establishing that really solid foundation of major with the 3rd.”

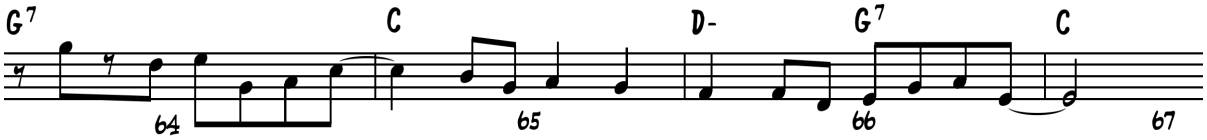

Figure 102. Spencer comment 12, m. 64-67.

Summary of Comments

Eighteen musical concept categories were coded from Spencer’s improvisation comments, with a range of 1 to 5 for each category. He selected chord/arpeggio most often (5), accounting for 26.3% of his total coded categories. Table 20 compares Spencer’s frequency counts and percentages for each category, and the mean frequency and mean percentage for all participants.

Table 20

Spencer's Coded Comments Data And Mean Coded Comments Data

Musical Concept	Spencer Frequency	Mean Frequency	Spencer %	Mean %
Chord/Arpeggio	5	3.86	26.3	21.1
Memorized Lick	3	3.14	15.8	17.2
Scale/Mode	1	2.86	5.3	15.6
Sequence	2	2.71	10.5	14.8
Range/Intensity	1	1.57	5.3	8.6
Rhythmic Emphasis	3	1.57	15.8	8.6
Other	3	1.57	15.8	8.6
Melodic Variation	1	1	5.3	5.5

Spencer identified rhythmic emphasis and the "other" category 3 times, almost twice the average among the participants. Both categories accounted for 15.8% of his total data, as opposed to the 8.6% average for rhythmic emphasis and "other" among all the performers. Spencer's comments results for chord/arpeggio, memorized lick, sequence, range/intensity, and melodic variation were similar to the averages with the greatest difference being 1.14 instances. He only mentioned scale/mode 1 time. This accounted for 5.3% of his total coded comments, as opposed to the 15.6% average among the participants.

Comparison of Categorical Analysis Results and Coded Comments Results

Spencer's categorical analysis results and coded comments results were similar for 4 of the 8 categories. The differences between the categorical analysis selections and coded comments for chord/arpeggio, memorized lick, sequence, and range/intensity were all 1 or fewer. Spencer selected melodic variation 4 times during his self-analysis, but only made 1 comment coded as melodic variation. He selected scale/mode 3 times during his categorical analysis, but only made 1 comment. Spencer mentioned instances of rhythmic emphasis 3 times, and made comments categorized as "other" 2 times. He did not select either category in his self-analysis. Table 21 displays the frequency of occurrences for musical concept categories in his categorical analysis and the coded comments analysis.

Table 21

Spencer's Frequency Of Occurrences For Categorical Analysis And Coded Comments

Musical Concept	SCRIBE Frequency	Comments Frequency	+/-
Melodic Variation	4	1	-3
Scale	3	1	-2
Chord	5	4	-1
Lick	2	3	+1
Rhythm	0	3	+3
Sequence	3	2	-1
Range	1	2	+1
Other	0	2	+2

Spencer Questionnaire Summary

Spencer studied improvisation in a private studio and took classes in improvisation. He listed sound, literature, scales/modes, chord/scale relationships, and melodic analysis as concepts emphasized in the lessons and classes. He cited melodic variation, and chord scale relationships as concepts he emphasized in his early improvised solos. When asked if that emphasis had changed he wrote that the "concepts are at a much higher level, and there are a greater number of concepts being used simultaneously." When asked who or what influenced that change, Spencer wrote "education, both academically and vernacularly (listening)."

Combined Results

Summary of Combined Categorical Analysis Data

The participants selected a total of 139 musical concept categories with the SCRIBE software. The range of total musical concepts categories reported by individual participants was 9 to 27 with a mean of 19.9. Table 22 displays total frequency, average, and percentage for each category.

Table 22

Combined Frequency, Average, And % For Each Musical Concept Category

Categories	Frequency	Mean	%
Lick	31	4.43	22.3
Scale	24	3.43	17.3
Sequence	22	3.14	15.8
Chords	19	2.71	13.7
Melody	18	2.57	12.9
Rhythm	12	1.71	8.6
Range	10	1.43	7.2
Other	3	0.43	2.2

The memorized lick category was recorded more frequently (31) than all other musical concepts. The range of responses within this category was 1 to 10 occurrences. This concept had the highest number of individual instances with 10 (Panella). It accounted for 22.3% of the total number of concepts, 5% more than any other concept. Participants also averaged one more occurrence of memorized lick per solo than scale/mode, which was the next highest in frequency.

Scale/mode and sequence were recorded second and third most respectively, and were similar in frequency with 24 and 22. They each accounted for between 16% and 17% of the total number categories. Chords/arpeggios and melodic variation were the fourth and fifth most frequently identified concepts with 19 and 18 instances each accounting for about 13% of the total. Rhythmic emphasis and range/intensity were selected considerably fewer times than the previously mentioned concepts with a frequency of 12 and 10 respectively, only accounting for 7% to 8% of the total. Only one participant (Panella) recorded the “other” category, and did so 3 times during his analysis. While 6 of the 7 participants did not utilize the “other” category in their analysis, 4 of the 7 made comments that were coded as “other”. Table 23 displays the individual categorical analysis results, as well as the total frequency, mean, and standard deviation for each musical concept category.

Table 23

Individual, Total, Mean Frequency Of Occurrences, And Standard Deviation Of Categorical Analysis For Melodic Variation (MV), Scale/Mode (SM), Chord/Arpeggio (CA), Memorized Lick (ML), Rhythmic Emphasis (RE), Sequence (SE), Range/Intensity (RI), And Other (O)

Participant	MV	SM	CA	ML	RE	SE	RI	O	Total
Brubeck	0	1	2	1	0	4	1	0	9
Cooper	3	4	0	5	0	4	1	0	17
Goines	2	5	2	3	5	5	2	0	24
Haydon	5	1	5	6	6	1	3	0	27
Panella	1	3	0	10	1	1	1	3	20
Parker	3	7	5	4	0	4	1	0	24
Spencer	4	3	5	2	0	3	1	0	18
Total	18	24	19	31	12	22	10	3	139
Mean	2.57	3.43	2.71	4.43	1.71	3.14	1.43	.43	
Standard Deviation	1.72	2.15	2.29	2.99	2.63	1.57	0.79	1.13	

Summary of Combined Coded Comments Data

A total of 128 comments were coded from the participant's comments. The range of total musical concept categories coded was 9 to 26 with a mean of 18.3. Table 24 displays total frequency, average, and percentage for each category.

Table 24

Combined Frequency, Average, And % For Each Musical Concept Category

Categories	Frequency	Mean	%
Chord	27	3.86	21.1
Lick	22	3.14	17.2
Scale	20	2.86	15.6
Sequence	19	2.71	14.8
Range	11	1.57	8.6
Rhythm	11	1.57	8.6
Other	11	1.57	8.6
Melodic Variation	7	1	5.5

The chord/arpeggio category was mentioned more frequently (27) than all other musical concepts coded in the comments results. The range of responses within chord/arpeggio was 1 to 8 occurrences, with an average of 3.86 among the performers. This category had the highest number of individual instances with 8 (Parker). It accounted for 21.1% of the total number of concept categories. The memorized lick (22), scale/mode (20), and sequence (19) categories were also reported more frequently, accounting for 17.2% (ML), 15.6% (SM), and 14.8% (SE) of the total coded comments results. The range/intensity (11), rhythmic emphasis (11), and “other” (11) categories were discussed less frequently, each accounting for 8.6% of the total coded comments results. Three individuals (Cooper, Panella, Parker) did not make comments coded as rhythmic emphasis; however, Haydon mentioned this category 5 times. Two performers (Goines and Parker) did not make comments that were coded as “other”. The melodic variation category was selected least often (7) in the comments analysis, only accounting for 5.5% of the total

coded comments analysis. Two participants made no comments that were coded as melodic variation. Table 25 displays the individual coded comments results, as well as the total frequency, mean, and standard deviation for each musical concept category.

Table 25

Individual, Total, Mean Frequency Of Occurrences, And Standard Deviation Of Comments Analysis For Melodic Variation (MV), Scale/Mode (SM), Chord/Arpeggio (CA), Memorized Lick (ML), Rhythmic Emphasis (RE), Sequence (SE), Range/Intensity (RI), And Other (O)

Participant	MV	SM	CA	ML	RE	SE	RI	O	Total
Brubeck	0	0	1	2	1	2	2	1	9
Cooper	2	4	1	2	0	2	1	3	15
Goines	1	3	4	3	2	6	3	0	22
Haydon	0	4	6	5	5	2	1	1	24
Panella	1	2	2	3	0	1	1	3	13
Parker	2	6	8	4	0	4	2	0	26
Spencer	1	1	5	3	3	2	1	3	19
Total	7	20	27	22	11	19	11	11	128
Mean	1	2.86	3.86	3.14	1.57	2.71	1.57	1.57	
Standard Deviation	0.82	2.04	2.67	1.06	1.90	1.70	0.79	1.4	

Comparative Analysis of Combined Comments Data and Combined Categorical Analysis Data

A total of 139 musical concept categories were selected during the categorical analysis, and a total of 128 musical concept categories were coded from the comments analysis. The greatest difference in individual concepts among both forms of analyses occurred in the melodic variation category. Participants selected melodic variation 18 times in their categorical analysis,

but only mentioned melodic variation 7 times in their comments. The melodic variation category accounted for 12.9% of the total number of musical concept categories within the self-analysis, but it only accounted for 5.5% of the total coded comments. The chord/arpeggio category was also different with 19 occurrences in the self-analysis and 27 occurrences coded in the comments analysis. The chord/arpeggio category accounted for 13.7% of the total categorical analysis, as opposed to 21.1% for the total coded comments analysis. The difference between the two methods of analysis for the memorized lick category was high (9), but the total percentages for both analyses were relatively similar (22.3% and 17.2%). The frequency of occurrences for the "other" category was higher during the comments analysis (11) than the categorical analysis (3), but the total percentages for both analyses were somewhat similar (2.2% and 8.6%). The categorical analysis results and coded comments results for scale/mode, rhythmic emphasis, sequence, and range/intensity were similar. The differences among the total percentage of self-analysis and comments results for those four categories were less than 2%. Table 26 displays the differences among the total frequency of occurrences for the categorical self-analysis and coded comments analysis, as well as the total percentage for each category within both methods of analysis.

Table 26

Differences Of Total Frequency Of Occurrences Of Categorical Analysis And Coded Comments, And Total % Of Categorical Analysis And Coded Comments

Category	Self-analysis frequency	Comment frequency	+/-	Self-analysis %	Comment %
Melodic V.	18	7	-11	12.9	5.5
Scale	24	20	-4	17.3	15.6
Chord	19	27	+8	13.7	21.1
Lick	31	22	-9	22.3	17.2
Rhythm	12	11	-1	8.6	8.6
Sequence	22	19	-3	15.8	14.8
Range	10	11	+1	7.2	8.6
Other	3	11	+8	2.2	8.6

Summary of Individual Musical Concepts

Melodic Variation

The melodic variation category was defined as the use of melodic content drawn directly from the tune with which the improviser is soloing. This might include direct quotes from the song or any variation derived from its melody. Of the 139 musical concepts identified during the participant's categorical analysis, 18 were melodic variation, accounting for 12.9% of the total number of musical concepts categories identified. The average number of instances of melodic variation among participants was 2.57. The standard deviation of melodic variation among the participants was 1.72. Six of the seven participants reported using some variation of the melody

in the self-analysis. Three participants identified melodic variation 18% to 22 % of their total number of categories selected. Three participants selected melodic variation 8% or less of their total number of concepts (0-8%).

Of the 128 musical concepts coded from the comments made by the participants, 7 were melodic variation, accounting for 5.5% of the total number of musical concept categories. The average number of instances of melodic variation was 1. The standard deviation of melodic variation was .82. Five of the seven participants reported using some variation of the melody in their comments analysis. Six participants identified melodic variation 7.7% or less of their total number of concepts. Cooper and Parker mentioned melodic variation most frequently (2); however, Cooper's percentage for the category was higher (13.3%) than Parker's (7.7%) due to the lower number of total categories Cooper selected. Table 27 displays individual frequencies and individual percentages for melodic variation, as well as total percentage, total mean, and the standard deviation for melodic variation among the participants.

Table 27

Individual Participants' Frequency Of Occurrences And Percentages For Melodic Variation, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	0	0	0	0
Cooper	3	2	17.6	13.3
Goines	2	1	8.3	4.6
Haydon	5	0	18.5	0
Panella	1	1	5	7.7
Parker	3	2	12.5	7.7
Spencer	4	1	22.2	5.3
Total	18	7	12.9	5.5
Mean	2.57	1		
Standard Deviation	1.72	.82		

Scale/Mode

The scale/mode category was defined as the use of a particular scale or mode to shape the melodic contour of the solo. This could include any of the standard scales and modes as well as altered scales developed within the jazz genre (blues, altered pentatonic, etc). Of the 139 musical concepts identified in the participant's categorical analysis, 24 were scale/mode, accounting for 17.3% of the total number of musical concept categories selected among all participants. The average number of instances of scale/mode among the performers was 3.43. The standard deviation of the scale/mode category was 2.15. All seven participants reported incorporating a

scale or mode to shape the melodic content in their self-analysis. Three individuals identified scale/mode more than 20% of their total number of categories selected, with a range of 20.8% to 29.2%. Only one participant indicated scale/mode less than 10% of their total (Haydon, 3.7%).

Of the 128 musical concepts coded from the comments made by the participants, 20 were scale/mode, accounting for 15.6% of the total number of coded musical concept categories. The average number of comments coded as the scale/mode category was 2.86, and the standard deviation was 2.04. Six of the seven participants reported scale/mode in their comments analyses. Two participants mentioned scale/mode more than 20% of their total number of concepts (23.1%, 26.7%). Two participants mentioned scale/mode less than 10% of their total number of concepts (5.3%, 0%). Table 28 displays individual frequencies and individual percentages for scale/mode, as well as total percentage, total mean, and the standard deviation for scale/mode among the participants.

Table 28

Individual Participants' Frequency Of Occurrences And Percentages For Scale/Mode, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	1	0	11.1	0
Cooper	4	4	23.5	26.7
Goines	5	3	20.8	13.6
Haydon	1	4	3.7	16.7
Panella	3	2	15	15.4
Parker	7	6	29.2	23.1
Spencer	3	1	16.7	5.3
Total	24	20	17.3	15.6
Mean	3.43	2.86		
Standard Deviation	2.15	2.04		

Chord/arpeggio

The chord/arpeggio category was defined as the use of chord spellings and their related arpeggios to shape the melodic contour of the solo. The focus is on chord qualities and melodies shaped by chordal techniques like arpeggiation. The chord/arpeggio category was selected a total of 19 times during the categorical analysis, accounting for 13.7% of the total number of musical concept categories selected among the participants. The average number of instances of chord/arpeggio among the performers was 2.71, and the standard deviation of the chord/arpeggio category was 2.28. Five of the seven participants reported incorporating a chordal technique to

shape the melodic content of their solo in their self-analysis. Four of the five performers selected chord/arpeggio more than 18% of their total number of categories selected, with a range of 18.5% to 27.8%. Goines selected chord/arpeggio 8.3% of his total, and Cooper and Panella did not select this category in their SCRIBE analysis.

Of the 128 musical concepts coded from the comments made by the participants, 27 were chord/arpeggio, accounting for 21.1% of the total number of coded musical concept categories. The average number of comments coded as chord/arpeggio was 3.86, and the standard deviation was 2.67. All seven participants reported chord/arpeggio in their comments analysis. Three participants mentioned chord/arpeggio more than 20% of their total number of concepts (25%, 26.3%, 30.8%). One participant mentioned chord/arpeggio less than 10% of their total number of concepts (6.7%). Table 29 displays individual frequencies and individual percentages for chord/arpeggio, as well as total percentage, total mean, and the standard deviation for chord/arpeggio among the participants.

Table 29

Individual Participants' Frequency Of Occurrences And Percentages For Chord/Arpeggio, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	2	1	22.2	11
Cooper	0	1	0	6.7
Goines	2	4	8.3	18.2
Haydon	5	6	18.5	25
Panella	0	2	0	15.4
Parker	5	8	20.8	30.8
Spencer	5	5	27.8	26.3
Total	19	27	13.7	21.1
Mean	2.71	3.86		
Standard Deviation	2.29	2.67		

Memorized Lick

The memorized lick category was defined as the use of a memorized phrase(s) within a solo. This excludes melodic content drawn from the tune with which the improviser is soloing. This could include a variety of melodic content, including: a melodic phrase/variation from another tune, a memorized lick used for standard harmonic progressions (e.g. ii-V-I), or any other pre-conceived musical phrase. The memorized lick category was selected 31 times in the participant's categorical analysis, accounting for 22.3% of the total number of categories selected

by the participants. The average number of instances of memorized lick among the performers was 4.43, and the standard deviation was 2.99. It was the musical concept category that was selected most often by the participants. All seven participants reported incorporating memorized licks within their self-analysis. It accounted for at least 11.1% of their total number of concepts for all seven participants. One participant (Panella) indicated memorized lick 10 times, the highest frequency of any single category among the performers. This accounted for 50% of his total number of categories. Three performers selected memorized lick more than 20% of their total number of categories (50%, 29.4%, and 22.2%).

Of the 128 musical concepts coded from the comments made by the participants, 22 were memorized lick, accounting for 17.2% of the total number of coded musical concept categories. The average number of comments coded as memorized lick was 3.14, with a standard deviation of 1.06. All seven participants reported memorized lick in the comments analysis. The memorized lick category accounted for at least 13.3% of their total number of concepts for all seven participants. Three mentioned memorized lick more than 20% of their total coded categories (20.8%, 22.2%, and 23.1%). Table 30 displays individual frequencies and individual percentages for memorized lick, as well as total percentage, total mean, and the standard deviation for memorized lick among the participants.

Table 30

Individual Participants' Frequency Of Occurrences And Percentages For Memorized Lick, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	1	2	11.1	22.2
Cooper	5	3	29.4	13.3
Goines	3	3	12.5	13.6
Haydon	6	5	22.2	20.8
Panella	10	3	50	23.1
Parker	4	4	16.7	15.4
Spencer	2	3	11.1	15.8
Total	31	23	22.3	17.2
Mean	4.43	3.14		
Standard Deviation	2.99	1.06		

Rhythmic Emphasis

The rhythmic emphasis category was defined as the use of rhythmically driven motives within a solo. The focus is on rhythm as opposed to melodic contour. The rhythmic emphasis category was selected a total of 12 times during the participant's categorical analysis, accounting for 8.6% of the total number of musical concept categories selected among all participants. The average number of instances of rhythmic emphasis was 1.71. Only three of the seven participants reported incorporating rhythmically driven motives within their solo in the self-analysis. Two

individuals identified rhythmic emphasis more than 20% (20.8 and 22.2%) of their total number of categories selected. The remaining 5 performers indicated rhythmic emphasis less than 10% of their total.

Of the 128 musical concepts coded from the comments made by the participants, 11 were rhythmic emphasis, accounting for 8.6% of the total number of coded musical concept categories. The average number of comments coded as rhythmic emphasis was 1.57, with a standard deviation of 1.9. One participant indicated rhythmic emphasis more than 20% of his total number of concepts (20.8%), while four indicated rhythmic emphasis less than 10% of their total categories. Three participants did not mention moments driven by rhythmic emphasis in their comments. Table 31 displays individual frequencies and individual percentages for rhythmic emphasis, as well as total percentage, total mean, and the standard deviation for rhythmic emphasis among the participants.

Table 31

Individual Participants' Frequency Of Occurrences And Percentages For Rhythmic Emphasis, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	0	1	0	11.1
Cooper	0	0	0	0
Goines	5	2	20.8	9.1
Haydon	6	5	22.2	20.8
Panella	1	0	5	0
Parker	0	0	0	0
Spencer	0	3	0	15.8
Total	12	11	8.6	8.6
Mean	1.71	1.57		
Standard Deviation	2.63	1.9		

Sequence

The sequence category was defined as a melodic or harmonic pattern successively repeated at different pitches. The sequence category was selected a total of 22 times during the categorical analysis, accounting for 15.8% of the total number of musical concept categories indicated among all participants. The average number of instances of sequence among the performers was 3.14, with a standard deviation of 1.57. All seven participants reported incorporating a sequence in their solo during their self-analysis. One individual (Brubeck)

selected sequence 44.4% of his total number of categories selected. Three individuals identified sequence more than 20% of their total number of categories selected (44.4%, 23.5%, 20.8%). Two participants indicated sequence 1 time in their categorical analysis accounting for less than 6% of their total categories selected.

Of the 128 musical concepts coded from the comments made by the participants, 19 were sequence, accounting for 14.8% of the total number of coded musical concept categories. The average number of comments coded as sequence was 2.71, with a standard deviation of 1.70. All seven individuals reported the sequence category in their comments analysis. Two participants mentioned sequence more than 20% of their total number of concepts (27.3%, 22.2%), and 2 two performers mentioned sequence less than 10% of their total number of concepts (8.3%, 7.7%). Table 32 displays individual frequencies and individual percentages for rhythmic emphasis, as well as total percentage, total mean, and the standard deviation for rhythmic emphasis among the participants.

Table 32

Individual Participants' Frequency Of Occurrences And Percentages For Sequence, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	4	2	44.4	22.2
Cooper	4	2	23.5	13.3
Goines	5	6	20.8	27.3
Haydon	1	2	3.7	8.3
Panella	1	1	5	7.7
Parker	4	4	16.7	15.4
Spencer	3	2	16.7	10.5
Total	22	19	15.8	14.8
Mean	3.14	2.71		
Standard Deviation	1.57	1.7		

Range/Intensity

The range/intensity category was defined as the use of expanded ranges to emphasize a different tone color, and/or to build intensity within the solo. The range/intensity category was selected a total of 10 times during the categorical analysis, accounting for 7.2% of the total number of musical concept categories selected among all participants. The average number of instances of range/intensity among the performers was 1.43. The standard deviation of the range/intensity category was 0.79. All seven participants reported incorporating at least one

instance of expanded range for tone color or intensity in their self-analysis. All seven participants identified range/intensity less than 12% of their total number of categories selected, with a range of 4.2% to 11.1%.

Of the 128 musical concepts coded from the comments made by the participants, 11 were range/intensity, accounting for 8.6% of the total number of coded musical concept categories. The average number of comments coded as range/intensity was 1.57, with a standard deviation of .79. Brubeck was the only participant that mentioned range/intensity more than 20% of his total number of concepts (22.2%). Five participants mentioned range/intensity less than 10% of their total number of concepts. Table 33 displays individual frequencies and individual percentages for range/intensity, as well as total percentage, total mean, and the standard deviation for range/intensity among the participants.

Table 33

Individual Participants' Frequency Of Occurrences And Percentages For Range/Intensity, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	1	2	11.1	22.2
Cooper	1	1	5.9	6.7
Goines	2	3	8.3	13.6
Haydon	3	1	11.1	4.2
Panella	1	1	5	7.7
Parker	1	2	4.2	7.7
Spencer	1	1	5.6	5.3
Total	10	11	7.2	8.6
Mean	1.43	1.57		
Standard Deviation	0.79	0.79		

Other

The "other" category was included to ensure that participants were not limited in their choices. Participants selected "other" when a musical device other than the musical concept categories designated for this study was being employed. The "other" category was selected a total of 3 times in the categorical analysis, accounting for 2.2% of the total number of musical concept categories selected among all participants. The average number of instances of "other" among the performers was less than 1 (0.43). The standard deviation of the "other" category was

1.13. Only one participant selected the “other” category within their categorical analysis (Panella). This accounted for 15% of his total number of categories selected.

Of the 128 musical concepts mentioned during the comments analysis, 11 were coded as “other”, accounting for 8.6% of the total number of coded musical concept categories. The average number of comments coded as “other” was 1.57, with a standard deviation of 1.40. Cooper, Panella, and Spencer all made 3 comments coded as “other”, accounting for 20%, 23.1%, and 15.8% of their total number of concepts. Goines and Parker did not make any comments coded as “other”. Table 34 displays individual frequencies and individual percentages for “other”, as well as total percentage, total mean, and the standard deviation for “other” among the participants.

Table 34

Individual Participants' Frequency Of Occurrences And Percentages For Melodic Variation, Total Frequency And Percentages, Mean, And Standard Deviation For Both Methods Of Improvisation Analysis

Participant	Self-analysis Frequency	Comments Frequency	Self-analysis %	Comments %
Brubeck	0	1	0	11.1
Cooper	0	3	0	20
Goines	0	0	0	0
Haydon	0	1	0	4.2
Panella	3	3	15	23.1
Parker	0	0	0	0
Spencer	0	3	0	15.8
Total	3	11	2.2	8.6
Mean	.43	1.57		
Standard Deviation	1.13	1.40		

CHAPTER 5

DISCUSSION

Musical improvisation is the oldest form of musical expression. Prior to standard musical notation, musicians repeated, interpreted, and spontaneously composed music for their own enjoyment and to share with others. Yet this most basic element of music is often absent in current music classrooms, despite calls for its inclusion. Publications have provided a variety of personal approaches to improvisation. Often these sequential, pedagogical, approaches are successful for a variety of ages and abilities. Yet little research exists that outlines the musical concepts that professional jazz musicians employ while improvising, and those that do investigate these concepts often do so well after the original performance, sometimes many years. The stimulated recall method used here allowed the performers to reflect on those musical concepts immediately following the performance, enabling them to more accurately categorize the concepts they included in their improvisation. The purpose of the present study was to analyze the musical concepts that artist-level jazz musicians employ while improvising on a jazz standard. Inquiries were made as to how each participant was taught to improvise. Trends among musical concept categories were identified.

Individual Concepts Discussion

Memorized Lick

The memorized lick category was selected most frequently among the participants during the categorical self-analysis (31), and had the second highest occurrences (22) coded in the comments section. Each participant cited at least one instance of the memorized lick category during his categorical analysis, and made at least two comments regarding memorized licks. On average, participants reported memorized licks 4.43 times during the self-analysis and 3.14 times during their comments. This category had the highest single number of occurrences by an individual participant (Panella 10), accounting for 50% of his total number of musical concept categories identified during his categorical analysis. This attributed to the highest standard deviation among the participants within a category (2.99). It's interesting to note that Panella only made three comments regarding memorized licks; however, it still accounted for a high percentage of his total comments made (23.1%).

Participants in this study incorporated memorized licks into their solos in a variety of ways. Some comments were made regarding licks that were inspired by the harmonic progressions within the tune. Azzara (1999), Berliner (1994), and Reeves (2006) discussed the importance of developing a musical vocabulary of memorized licks to facilitate a variety of harmonic changes, scale/chord relationships, and other theoretical considerations. Spencer discussed the process of creating this theoretically based vocabulary as a student.

> I remember learning this tune when I was a freshman in college. I went through all these exercises. So the reason I asked you whether that was an arpeggiation or a lick is because it's a straight arpeggiation. It's just arpeggiating down. It's basically the augmented triad

> of the major tonic chord, but it works over that [D7] altered because it contains all the right notes. So I used to practice that over and over till I could really play super locrian. So it is an arpeggiation, but it's also a lick that I just remember, and it helps me get coordinated leading to the [D] minor 7.

Goines commented on the use of a memorized lick to navigate a chord change, "That was a quote that Sonny Stitt uses a lot, but instead of playing it literally, I used it to resolve to the IV chord of the bridge." Cooper discussed his theoretical approach to "Take the 'A' Train" in his final comment, and related its harmonic changes to similar tunes, creating a theoretically based language that he reuses for each song.

> I try to utilize the harmonic things that are there. On "Girl from Impanema", and "Watch What Happens," a Michel Legrand tune where the second chord is that secondary dominant, it's that five of five chord, I will tend to use an augmented sound on that, or a Lydian dominant sound on that to make that distinct from the first tonic chord.

Haydon, Panella, and Parker all cited blues influences when describing a memorized lick. Several methods and pedagogies regarding improvisation have espoused the blues scale as a good starting point for developing licks in novice player's vocabulary (Haerle 1975, Lawn & Hellmer 1993, Fratia 2002, Tomassetti 2003). Panella discussed the importance of blues in his own style of playing.

> That (sings lick) occurs several times, and that goes back to my roots. My first improvisation experiences were learning how to play the blues, so I tend to be a more blues oriented player. One of the first players I latched onto as a listener and as a saxophone student was Jean Hammonds. Jean being part of that soul, bop, hard-bop kind of thing, even though he did have roots going back further than that, he used a lot of blues

licks. Cannonball Adderley is another one of my favorite saxophone players who sometimes did so gratuitously, and I'm infected.

Many improvisation methodologies advocate the importance of transcriptions in the learning process (Stamm 2001, Weir 2003, Knox 2004, Marshall 2004b, Meehan 2004, Dahlk 2007). Most of these studies relate the process of transcribing and memorizing a variety of melodic ideas to the process of language acquisition. They equate the process of improvisation to that of a conversation with other performers. Developing a strong foundation of musical ideas allows performers to improvise more comfortably without fear of what they might "say" next. Several participants in the current study referred to these moments as quotes. Sometimes these quotes were drawn from recordings of other musicians. Goines characterized all of his memorized licks as "quotes" from other jazz performers. "Right there I had a little bit of a quote out of "Cool Blues" by Charlie Parker, but I didn't play the entire quote in hopes that I kind of disguised it a little bit." He also incorporated a quote by Sonny Stitt on two separate occasions during his solo. Cooper talked about including a quote from the original improvised solo recorded by Duke Ellington. Brubeck discussed two moments within his solo that were inspired by melodic material from other songs: "for a second I almost quoted 'Gary Indiana, Gary Indiana' and then pulled out of it," and "I almost did 'It's raining, it's pouring, the old man is snoring', but I didn't really mean to."

Monk (2012) discusses the importance of reusing ideas throughout a solo as a means of unification within the improvisation. These ideas are intended to create consistency and structure to an improvised solo. The present findings reflect this sentiment within both the sequence and the memorized lick category. Goines mentioned reusing the Sonny Stitt idea on two separate occasions, though he did not discuss it as a means of unification. The reuse of ideas was also

discussed within the “other” category. Brubeck, Panella, and Spencer all commented on the importance of developing a melodic theme as a means of motivic development.

This brings into question the extent to which improvising is a spontaneous creative approach to music performance. The use of pre-existing licks, whether purposefully memorized, or a result of previous musical experiences appears to be a significant improvisational tool for professional jazz performers. Sequences were originally part of this category, due to their prescribed nature. However, upon hearing the definitions for each music concept, Brubeck mentioned the importance of sequences within his own style of improvising. Since he was the first participant, the sequence category was added to the musical concept list. Memorized licks, sequences, and the use of range/intensity are all examples of what Norgard (2009) referred to as the “idea bank”. Idea referring to the “coherent musical structures that vary in explicitness and extent. The term bank refers to the procedural and auditory memories of these ideas.” Sequence and memorized lick were among the most often cited categories within this study, again implying that much of the material that professional musicians employ is pre-conceived material, melodic content that has been practiced and re-used throughout each participant’s life.

Sequence

The sequence category was indicated third most often among the participants during the categorical self-analysis (22), and had the fourth highest occurrences (19) coded in the comments section. All participants selected the sequence category during their categorical analysis, and all the participants made a comment coded as sequence. On average participants reported the sequence category 3.14 times during the self-analysis, and 2.71 times during the comments analysis. Two participants varied greatly from the other five during the self-analysis. Haydon and

Panella only reported 1 instance of a sequence. The other five participants averaged 4 instances during their categorical analysis. Goines (6) and Parker (4) made several more comments coded as sequence than the other five participants, who averaged a little less than 2 sequence comments. These differences attributed to fairly high standard deviations for both methods of analyses (1.57 for SCRIBE, 1.70 for comments). As mentioned earlier, this category was originally included in the definition for the memorized lick category because of its prescribed nature, but Brubeck emphasized the importance of this musical concept in his own style of playing.

Sequences are often used to navigate chord changes and modulations in all styles of composition and improvisation. Sequences frequently become a part of jazz performers' vocabulary allowing them to facilitate similar chord changes from one song to another (Azzara 1999, Reeves 2006, Berliner 1994). Spencer spoke in detail about one sequence's functionality in a comment he made. "Clearly a sequence. Choosing to use that augmented tonic chord over the second chord, because you're basically dealing with a half step, it just makes an easy approach to a sequence." Similarly, Panella reported using a sequence to address the altered second chord in "Take the 'A' Train". "That turn around right there, I think I've probably used that a lot. It's a turn around sequence with some flatted ninths." Goines spoke about the importance of varying a sequential pattern during one of his comments saying:

> Ok, that was sequencing right there, but I didn't quite get the sequence that I wanted. So that's one thing that happens in jazz. We try to make sure that we listen organically. We're not trying to play things that are memorized all the time. We want to really play the music. When you play something you don't necessarily want to play, or it doesn't come out exactly how you wanted, you have to figure out how to take that and make it a

part of your expression…So it was sequencing, but it was a sequence that I didn't intend to do. I tried to figure out how I was going to work my way out of that I to ultimately resolve to the one chord of the last A section.

Several comments coded as sequence were also coded as scale/mode or chord/arpeggio, implying that sequences might be used as a tool to navigate the chord changes that occur in a song. This theoretical approach to improvisation suggests a great deal of spontaneous creation despite the use of practiced, memorized patterns. Like a verb that gets reused in a variety of places within a speech, sequences seem to be natural patterns of musical dialogue that are reused in a variety of ways during an improvised solo.

Range/intensity

The range/intensity category was one of the least frequently selected musical concepts (10 and 11), though each of the participants in this study noted at least one example of range and/or intensity employed during his solo, perhaps suggesting a formulated high point within each performers improvisation. Participants only indicated this category an average of 1.43 times during their categorical analysis and 1.57 times during their comments. The standard deviation for this category was low among the participants during both modes of analyses (0.79), conveying some agreement among the participants within this category.

Several pedagogical methods provide suggestions for implementing melodic energy and dramatic shape into a solo (Tomassetti 2003, Fratia 2006, and Kane 2006). Kane featured this concept in his article, providing several ideas for building intensity within a solo: playing in a higher register, playing faster and more technical passages, agogic accents, unexpected phrasing, louder volume, repetition of a phrase, and dissonance.

Participants in this study reported using four of these "tools" during their solo. Each performer commented on the use of range to shape the contour. Spencer: "So I told you there I really wanted to play a D. I wanted to play (sings) an octave…but then I was thinking about the fact that we're in a hotel, so I went with the B." Often the use of an extended high range is used in conjunction with a louder volume. Brubeck illustrates this idea in his comment:

> I wasn't sure if I was playing two choruses or three, but I was trying to sort of build an arch so I was ending up high in my solo. Sort of bring closure to the solo. A little more power.

Each of the participants reported using the upper part of their register to emphasize a moment within the piece, however Cooper commented on incorporating his lower tessitura: "I'm starting simple and low. I try and do that to give myself a starting place. So I started low on the horn..." Brubeck, Cooper and Goines all incorporated intensity through the use of a long held note. Goines: "I wanted the intensity of the sound to come through a held note because we don't always have to play intensity by playing lots of notes. We can play longer notes and still be intensified." Brubeck and Cooper also discussed the importance of listening to the accompaniment at those particular points. Goines also mentioned a moment in which he used the "repetition of a phrase to create intensity" in his solo.

Upon listening to the solos and hearing the descriptions by the participants, a pattern began to form regarding this musical concept. All of the performers reported, be it through the categorical analysis or the comments they made, range/intensity at what appeared to be the high point in their solo. Each solo lasted around 98 seconds. These particular intense moments (some participants identified more than one range/intensity moment) ranged from 50 seconds to 77 seconds into their solo. The average point among the participants was 67 seconds. The

professional musicians that participated in this study all appeared to be aiming for a similar dramatic moment in their solo. This approach to intensity and drama is often echoed in great books, building towards a high point around 2/3rds of the way into a story. While this certainly is not the only prescription for intensity within an improvised solo, it does seem to be a popular format for the participants in the present study.

Rhythmic Emphasis

The rhythmic emphasis category was one of the least frequently selected categories in both modes of analyses. Neither Cooper nor Parker reported a moment of rhythmic emphasis. It is interesting to note that Parker is a percussionist, and he cited “lots of rhythmic ideas” as a concept he emphasized in his early-improvised solos. He mentioned a greater emphasis on chord substitutions and melodic development when discussing the musical concepts he currently emphasizes. Several participants in the current study seemed to be focused on other musical concepts, despite points of rhythmic complexity within each of their improvised solos. Panella only indicated this category one time during his categorical analysis. Brubeck made one comment regarding this category. He discussed a syncopated moment in his solo, suggesting that a drummer might have picked up on the rhythmic idea in a live setting and responded similarly. It is possible that a lack of live musicians in this study, and in particular a live drummer limits some sense of rhythmic emphasis within an improvised solo. Spencer did not select rhythm in his self-analysis, but made three comments regarding the concept.

Goines (5) and Haydon (6) both emphasized this category in their analyses. This category accounted for more than 20% of their total self-analyses data. Goines made fewer comments (2), but Haydon made 5 rhythmic emphasis comments accounting for 20.8% of his total comments.

Goines discussed the importance of this category in his first comment, “In the break right there after the melody is played, I’m more interested in the rhythmic precision to try to make sure that music continues to move forward. Because the break is like the moment of truth.” Haydon and Spencer both spoke about the use of rhythmic displacement in their solos. Spencer: “I like off-kilter rhythmic ideas as well, that lead back to the tonic chord. So creating some rhythmic tension to get back to the I chord again.”

Rhythm is a fundamental concept used in several sequential improvisation methods (Coke 1964, Meadows 1991, Lawn & Hellmer 1993, Snyder 2003, Volz 2005, Kane 2006). Beginning musicians are often encouraged to explore rhythm before adding the complexity of performing the “right notes.” Burnard (1999) suggested that elementary students chose percussive instruments because it enabled them to incorporate familiar bodily movements. Snyder’s sequential approach begins exclusively with rhythmic exploration. Students echo claps and begin to create original rhythmic patterns that are subsequently echoed by others. Notes are added slowly while rhythmic variety remains a focus within this method. Rhythm is also a fundamental concept for many beginning band methods. It is possible that rhythmically driven ideas and motives might be such a natural part of some musicians' vocabulary that they produce complex rhythmic patterns without conscious effort, like an elegant speaker who pauses appropriately, varying the speed and patterns of their speech to engage the listener.

Other

The “other” category was included to address any musical concepts that were excluded from the prescribed categories in this study. Panella was the only participant that selected the “other” category during the categorical self-analysis, selecting it 3 times. Five participants made

comments that did not correspond with the definitions of the prescribed musical concept categories, and were thus coded as “other”. Cooper, Panella, and Spencer all made 3 “other” comments. This accounted for 23.1% of Panella’s total comments. Brubeck and Goines both made 1 “other” comment.

Six of the 11 comments coded as “other” addressed the idea of motivic or thematic development. Spencer, Panella, and Cooper all made comments that expressed this concept in their solo. All of Panella’s “other” comments were related to the idea of motivic development. His first comment sets up this motivic dialogue that reoccurs throughout his solo:

> I’m big on motivic development in this instance. I learned to talk with my horn, so it’s a combination of things I would classify as “other”, because it’s not melodic material, it’s not a lick necessarily, and it’s not necessarily a sequence. I’m always trying to sing what I play, and play what I sing. I sing memorized material the same way I would speak a familiar phrase, but it still has meaning for me. They’re not necessarily the brain shutting off. I’m still speaking thoughtfully.

As the solo went on he continued to develop new thematic ideas in his solo, discussing the importance of this concept in his own method of teaching improvisation:

> That first idea is sort of a meaningless idea, but the repetition of it sort of gives it emphasis and eventually gives it meaning, and so you repeat it. It’s like the storytellers rules of three. You know Three Little Pigs? At the third instance of the occurrence the story changes. So I use that device when I play sometimes. I’ll play an idea and try and approach it from the standpoint that nothing is ever wasted. That the dumbest idea, even a wrong note, if played again and again and worked through will actually turn out to be a much more creative and interesting part of the story. As opposed to playing something

(sings) and abandoning it. I try to emphasize that with my students. Take simple ideas and build upon them, and thereby engage listeners in that regard, taking them along to figure out what he's going to do with the idea.

In his last comment, Panella discussed how his own educational background influenced this approach to thematic development.

> The reuse of ideas is something that, to me, helps tie a solo together. One of my teachers was Rich Madison, a great jazz euphonium player, and he always talked to us about telling stories, and about playing to someone in the audience. So I try to make sure in my playing that I'm playing to people and not at them. It doesn't mean necessarily that I'm trying to play dumbed down stuff, but I'm always trying to carry them with me. Whether I'm doing an original tune or that kind of thing [Take the 'A' Train], I do my best to use motivic development to carry the ideas through so that the audience follows along with what I'm doing.

Spencer's first comment incorporated two musical concepts, using a motive to connect the first two chords of the A section:

> So I'm just trying to build a motivic idea (sings the motive), and just introducing the idea of a flat 9. You know because of those first two changes. I think modally because that's how I was brought up at the North Texas school of looking at things. So when I see changes I see chord/scale relationships immediately, so I'm trying to set up that dialogue between those first two changes of straight major versus the altered or Super Locrian actually.

This musical concept is mentioned in improvisation methods and research. Squinobal (2005) discussed John Coltrane's use of thematic development on his album *A Love Supreme*. This is

the focus of Tomassetti's (2003) third step in his method for teaching beginning improvisers. Norgard (2008) identified this as one of the four musical concepts that were common among his participants. It appears that this concept should have been a category within this study; however, participants in a pilot project expressed concern over the large number of category choices during the categorical self-analysis. Two participants in the present study expressed similar concerns. Adding another category might have created extra confusion during the categorical self-analysis. The comments portion of this study was included to address this issue.

Phrasing is another musical concept that is mentioned in methodologies for teaching improvisation. This is the basis for Tomassetti's (2003) first step for beginning improvisation. Berliner (1994) discusses the importance of developing logical phrases in a solo. Brophy's (2005) experiment found that 9 year olds were more adept at developing phrases than they were at 7. Spencer made two comments that addressed phrasing within his solo:

> But I don't like the way I'm ending every phrase. I should have played through a few more phrases. I don't know why I'm bringing all of the phrases to a conclusion, like a four bar phrase. I think it's because we're in an academic setting. I feel like need to make sure the audience understands that that's a phrase.

His other comment addressed the overall architecture and phrasing of his solo:

> Ok so that was like my brain being like a 32nd note behind everything. I knew what I wanted to do, but I wasn't quite, I was thinking well we're ending the second chorus, so I should bring things down. So I was actually fighting with myself not to keep building. I knew I only had four bars left to bring this thing to a close, so I thought 'Oh God, I better get down, bring the plane down'.

Haydon, Cooper, and Brubeck each made a comment that did not coincide with any of

the categories discussed in this study. Haydon mentioned a moment in which he ornamented a melodic idea. In his first comment, Brubeck refers to his opening motive as a "pure improvisation", suggesting that it did not fit any musical concept framework. It is interesting to note here that he was the only participant that did not receive formal training for improvisation. It is possible that these spontaneous, uncategorized, musical ideas would be more prevalent with artists of similar backgrounds. Coopers uncategorized comment addressed another common tool used by professional jazz musicians:

> That's really kind of an important one. In the accompaniment there's a lick that the guy plays (sings). By the time I heard it I responded to him. I played in whole tone though on the V of V chord, because that's the second chord in *'A' Train*, that secondary dominant. So on the secondary dominant I convert that over to whole tone and I play the rhythmic thing. I'm answering it.

The lack of live musicians to react and communicate with is certainly a limitation of this study. Brubeck advocated the dialogue that occurs between musicians during an improvised solo:

> As you get better, you learn to get out of your personal headspace and listen and react to what other people in the band are doing. This keeps improv fresh because there are an infinite amount of possibilities on the bandstand to react to. That's improvisation.

Melodic Variation

The melodic variation category was selected 18 times during the categorical analysis. This was the fourth most often selected category accounting for almost 13% of the total concepts in the self-analysis. Participants were much less likely to discuss instances of melodic variation during their comments. This category was only discussed 7 times among all participants during

the comments portion of the study. This was the least mentioned category, only accounting for 5.5% of the total comments analysis. It remains to be seen why this category elicited fewer remarks from five of the six participants that selected it in the categorical analysis. Haydon selected it 5 times, but did not make a comment related to melodic variation. Spencer selected it four times, accounting for 22.2% of his total self-analysis, but only made one melodic variation comment (5.5%).

Most participants just mentioned this category in passing, stating that they were "emulating the train idea," or playing "a little quote of "Take the 'A' Train"." Spencer went into detail when discussing a melodic variation instance, incorporating several musical concepts.

> That's a combination of using both the tune and making it into sort of a rhythmic variation. I'm piling up at that point, the ideas of the arpeggiation that I introduced early, the melody, a melodic variation in what I'm doing, and the harmonic ideas at the same time.

Like rhythmically driven motives, melodic variation is another basic tool introduced to beginners in several personal methods (Marshall 2004b, Snyder 2003). In his questionnaire, Brubeck cited melodic variation as a concept that he used as a young performer. He listed both "sense of melody" and "variations of the melody" as concepts that he emphasized in early improvised solos, however he did not indicate an instance of melodic variation in either mode of analyses.

Chord/Arpeggio and Scale/Mode

The chord/arpeggio and scale/mode category will be discussed together because of the similarities these concepts share. Both musical concepts address the harmonic implications of the chord changes. Scale/mode was defined as the use of a particular scale or mode to shape the

melodic contour of the solo. There are a variety of options in regard to this concept. This could include any of the standard scales and modes as well as altered scales developed within the jazz community (blues, altered pentatonic, etc). Chord/Arpeggio was defined as the use of chord spellings and their related arpeggios to shape the melodic contour of the solo. The focus here is on chord qualities and melodies shaped by chordal techniques like arpeggiation. Both concepts are used to navigate chord changes, and occasionally theses concepts were employed simultaneously when discussing moments within participants' solos.

The chord/arpeggio category was selected fourth most often during the categorical self-analysis (19), but it had the highest occurrences coded in the comments section (27). Two participants (Cooper and Panella) did not select the chord/arpeggio category during the self-analysis, however, all the participants made at least one comment that was coded as chord/arpeggio. On average participants reported chord/arpeggio 2.71 during their categorical analysis and 3.86 times during their comments analysis. This category had the highest number of comments made by one performer (Parker, 8), accounting for 30.8% of his total comments. The standard deviation for this category was high in both modes of analyses (2.29 and 2.67), due to varied emphasis of this category among the participants. Haydon (6), Parker (8), and Spencer (5) all indicated this category 25% or more of their total comments made, while Brubeck and Cooper only made one comment coded as chord/arpeggio.

The scale/mode category had the second highest frequency during the categorical self-analysis (24), and it had the third highest occurrences in the comments analysis (22). All seven participants selected the scale/mode category during their self-analysis. Brubeck was the only participant that did not make a comment coded as scale/mode. The mean for this category during their categorical analysis was 3.43. Participants average 2.86 comments. This category

represented more than 23% for both modes of Cooper and Parker's analyses. This category accounted for more than 20% of Goines's total categorical analysis data, but his comments were similar to the average. Like the chord/arpeggio category, the standard deviation for this category was high in both modes of analyses (2.15 and 2.04), due to varied emphasis of this category among the participants. Haydon and Brubeck only reported one instance during their self-analysis, but Haydon made four comments related to scales. Spencer selected this category 3 times during his categorical analysis, but only made one scale/mode comment, accounting for 5.3% of his total comments.

"Take the 'A' Train" was selected because of the altered second chord in the progression and the emphasis of a different tonic sound in the B section. This was done to ensure that performers were not blanketing simple diatonic licks throughout their entire improvised solos. That altered chord occurs in the third and fourth measures of each A section in "Take the 'A' Train." Eleven of the comments coded as scale/mode and 7 of the comments coded as chord/arpeggio occurred during the first four measures of the A section. Fourteen comments coded as chord/arpeggio or scale/mode were made during the last four bars of the A section. Participants commented on these categories a total of 32 times during the A section. Each participant soloed over the changes for the A section 6 times, totaling 48 bars. The B section produced a total of 15 comments coded as either scale/mode or chord/arpeggio. The B chord progression was played twice, accounting for only 16 measures of their solos. While many of the comments about chord/scale relationships were centered on the altered second chord, the B section incorporated higher rates of these concepts.

Cooper, Goines, Panella, and Spencer all commented about the significance of the altered second chord. Spencer's first comment related to the "dialogue" between the first chord and that

altered second chord:

> So I'm just trying to build a motivic idea (sings the motive), and just introducing the idea of a flat 9. You know because of those first two changes. I think modally because that's how I was brought up at the North Texas school of looking at things. So when I see changes I see chord/scale relationships immediately, so I'm trying to set up that dialogue between those first two changes of straight major versus the altered or Super Locrian actually.

Goines also described the altered second chord in terms of modality:

> Again that's that Mixolydian/Lydian kind of something I'm doing, but I employed it inside of a major augmented fifth chord. And that's taking place over the II chord in "Take the 'A' Train" because it has a sharp 11 in it.

Panella spoke about his shift in soloing styles towards a more "theory oriented" harmonic approach when dealing with augmented chords:

> In that instance there when I get to chords, particularly augmented chords, augmented major 7's, I tend to become more theory oriented. I do have vocabulary. I do know the lay of the land on my instrument, but at that point I'm trying to make sure that I'm outlining that harmony. Whereas in other instances if it's ii V I's, turn around cycles, I'm not thinking very much at all about the actual harmony. But on a tune like this when I've got that augmented, some people play it as an augmented dominant seventh or a dominant seven flat five, I'm trying to bring that quality out at that point. So it tends to be a little bit of a gear change for me where the theory aspect of things will kick in.

Cooper made comparisons to the present tune and other songs that incorporate a similar altered chord:

> On “Girl from Impanema” and “Watch What Happens,” a Michel Legrand tune, where the second chord is that secondary dominant, it’s that five of five chord, I will tend to use an augmented sound on that, or a Lydian-dominant sound on that to make it distinct from the first tonic chord. Though the chord moves up by step, I will use something to make those two chords sound a lot different, because it tends to be that a lot of guys will just blanket. So on this tune in particular, there is a way I improvise over it and the tunes that are like it that I named.

Chord/scale relationships have remained a focus of improvisational research and pedagogical modes of improvisation methodologies. While this concept is simplified or held out of some beginner jazz improvisation approaches, it is often a point of emphasis in many of the books and advanced improvisation articles (Berliner 1994, Coker 1964, Fratia 2002, Haerle 1975, Julien 2001, Poulter 2008, Reeves 2006, Salvatore 1971, Snyder 2009, Squinobal 2005, Steinel 1995, Tomasetti, 2003, Weir 2003). Several research-based studies have suggested that high achieving improvisers understand the harmonic structures and theoretical knowledge within the jazz idiom (Madura 1996, May 2003, Norgard 2008, Ward-Steinman 2008). Norgard reported the harmonic structure as the most often cited musical concept among the artist-level jazz musicians that participated in his study. Chord/scale relationships are often a key element of jazz improvisation classes and lessons. All seven participants in the current study discussed the importance of scale/chord relationships in their questionnaires. Brubeck, who did not participate in a class or lessons, mentioned, “understanding the chord structure, and outlining/arpeggiating the chord” as a point of emphasis in his early solos.

Goines and several researchers and pedagogues refer to this musical concept as the language of jazz. Horowitz (2010) discusses the similarities between language acquisition and

the process of learning to improvise in his book *The Improvising Mind*. He draws parallels between the linguistic rules that are learned early in language acquisition to that of harmonic rules that are learned by aspiring improvisers. Pentatonic scales are often used as a starting point, providing basic functionality for a variety of harmonic settings. As novice improvisers become comfortable with these basic building blocks of the jazz vernacular, more advanced concepts like chord/scale relationships and standard harmonic progressions are incorporated. Advanced improvisers learn to incorporate a variety of chord and scale substitutions that operate like a thesaurus, allowing the performer to vary melodic ideas resulting from standard harmonic changes. As they become adept at incorporating these altered sounds over familiar chords, they begin to apply them to more complex harmonic changes. These two concepts were among the most selected categories in this study. Memorized lick is the only category indicated more often overall; however, participants made five more comments coded as chord/arpeggio than memorized lick. These two concepts were also used more often in conjunction with another concept.

Conclusion

This study suggests four musical concepts that artist-level jazz musicians employ most often in their improvised solos: memorized licks, chord/arppegio, scale/mode, and sequences. "Take the A Train" was selected because of its varied chord progression and in particular the altered ii chord. Perhaps as a result, half of the concepts emphasized were related to the reading and interpretation of harmonic implications within this song. While the stigma still exists that jazz musicians are simply pushing down buttons and making things up as they go, the current research suggests that these musicians are extremely well trained and well versed in theoretical

implications of the music they perform. None of these musicians were told in advance what tune they would improvise over, yet all were very familiar with the song and its chord changes.

Participants also used memorized licks and sequences to navigate specific harmonic changes within their solos. Horowitz (2010) makes connections between memorized material and early speech acquisition. Similar to toddlers learning to speak through imitation, improvisers in all disciplines seem to draw from previously learned music material. These groups of memorized phrases and ideas are often employed without conscious effort, like a verbose speaker drawing from past experiences of public oration. Tools like memorized licks and sequences, as well as an understanding and application of chord/scale relationships provide the foundation for jazz improvisers. Music educators would serve their students well to emphasize these concepts when teaching them to improvise. There are a variety of personal methodologies available to novice jazz improvisers that present sequential approaches to introducing all of these concepts. It is up to us as educators to find what works best for us and our students. We cannot let fear of the unfamiliar continue to be the reason that we do not properly educate our students in this most fundamental style of music making.

Questionnaire Discussion

Each participant filled out a questionnaire after watching and commenting on their solos. These nine questions were created in hopes of revealing trends in the pedagogical background of each participant in regard to jazz improvisation. The thought was that different styles of learning might translate to different musical concepts that were emphasized. Most of the participants had similar backgrounds in their improvisation education. Six out of the seven participants had at least a masters degree in music education or performance, and four had earned their doctorates.

All participants began learning to play an instrument at a young age, ranging from 5 to 12 years old, with most beginning around age 9. Five participants reported improvising on other instruments regularly. All seven reported participating in jazz combos. Most participants also reported performing in wind bands, orchestras, and rock bands as students. See appendix A for complete questionnaires from each participant.

Six participants reported studying improvisation privately with a teacher and/or in a class setting. When asked what was emphasized in these lessons and classes all but one of them reported scale/chord relationships and navigating typical chord progressions (ii-V-I). Goines again refers to this as "learning the language of jazz." Berkowitz (2010) suggests the importance of harmonic understanding for improvising keyboardist ranging back to the Baroque period. He refers to musical treatises that outline the importance of the theoretical knowledge of harmonic progressions when learning to improvise. Chord/scale relationships are like the grammar of improvisation. Performers become "articulate" improvisers when they are able to apply these rules without thought.

When asked what musical concepts they emphasized as novice performers, four participants again cited playing the correct chord changes. Participants also stressed melodic variation/development and blues inspired licks when discussing early efforts at improvisation. It is interesting to note that Parker listed rhythmic ideas as both a concept he emphasized in early efforts at improvisation and one that was stressed in classes, yet he did not make a comment or select rhythmic emphasis in his self-analysis. As mentioned in the discussion, it is possible that rhythmic ideas have become such a natural part of Parker's improvisation language that he is not aware of moments that observers might infer as rhythmic emphasis.

Participants were then asked if those emphasized concepts had changed over the years.

Cooper and Goines both responded that they had not changed. Cooper wrote " not playing wrong notes! Playing the correct chord changes" in his response to the initial question. Goines simply wrote "melodic development" as the most important concept employed in early and current improvised solos. Haydon, Parker, and Spencer all spoke about making more complex musical choices. Haydon wrote "Getting deeper into musical concepts such as scales (beyond diatonics) and chord substitution." Similarly Spencer wrote " concepts are at a much higher level, and there are a greater number of concepts being used simultaneously." Brubeck echo's these sentiments and goes on to discuss the importance of listening and reacting to other performers in the band.

> All musical experiences lead to increasing your improv vocabulary. Quoting other musical material. When you start off you are very concerned about having your personal playing skills together. As you get better, you learn to get out of your personal head space and listen and react to what other people in the band are doing. This keeps improv fresh because there are an infinite amount of possibilities….That's improvisation.

When asked who or what inspired this change, most of the participants cited listening to and performing with other great jazz performers. Some pointed to continuing classroom education and clinics on improvisation. Panella offered a different reason for this change, saying "I got tired of finding myself playing the same ideas and worked on singing and playing and using my brain the same way in either instance."

It seems clear that developing a clear understanding of chord changes and their relationships with related scales is paramount for aspiring improvisers. Several also discussed the importance of creating, developing, and imitating melodic ideas in their improvisations. There are a variety of books and articles available that address these concepts, and provide quality exercises for novice improvisers. Reeves (2006), Haerle (1975), Salvatore (1971), and Lawn &

Hellmer (1993) are all books devoted to exploring chord/scale relationships in jazz improvisation. Coker (1964) continues to be a popular book in jazz education and improvisation courses. It provides a well balanced approach to addressing all the concepts emphasized in this study. Over the past 30 years several music journals have provided a variety of pedagogical methods for jazz improvisation. Many of the articles focused on developing novice improvisers address the same concepts that participants in the current study emphasized in their early improvisations (Azzara 1999, Dahlke 2007, Fratia 2002, Knox 2004, Meehan 2004, Snyder 2003, and Tomassetti 2003). It is up to current music educators to seek out these sources and begin implementing these methodologies in their classrooms.

Limitations

Participants in the current study were selected because of their mastery of the jazz improvisation idiom, varied instrumental focus, and relative close proximity at the time of the observation. The participant pool was originally intended to be ten, but due to scheduling conflicts three participants were unable to complete the investigation. A larger group of participants would increase the validity of the current project. All participants were male, perhaps suggesting some gender bias in the results.

Six of the seven participants received formal jazz training in bachelors and masters programs. Four of the participants earned doctorates in performance or education. Brubeck was the only participant that did not participate in improvisation classes, though he did speak of informal lessons with his father (Dave Brubeck) and other jazz musicians that he encountered at home and on the road. A greater variety of educational backgrounds could reveal different trends in musical concepts among professional jazz improvisers.

The method for this project also created some limitations in the current study. The lack of live musicians serving as a rhythm section for the accompaniment may have affected the results. The interplay among jazz improvisers was missed in the present study, however, some participants mentioned listening and reacting to what was happening in the recording.

A lack of SCRIBE software training among the participants may have affected the results in the present study. Due to the large number of musical concepts and corresponding buttons, some participants expressed concern that they may have "missed one or two" of the musical concepts during the categorical analysis. Because of time restraints, participants were given instructions on the software, but no training was administered.

One participant familiar with Norgard's research mentioned that a visual representation might aid in his interpretation of the musical concepts that he used in his solo. Norgard used computer software that provided basic transcriptions for participants to refer to while commenting on their improvisation.

Implications for Further Research

The current study was completed to add to the extant literature regarding jazz improvisation, especially as it relates to music education. There are an assortment of scholarly achievement studies and personal methodologies regarding improvisation and its implementation in public schools. However, little research points to exactly what professional improvisers are thinking while they improvise, and even fewer studies explore any parallels that might exist in successful music classrooms today. The books and studies that do investigate the musical concepts artist level musicians employ are often done well after the fact, asking artists to reflect on recordings that happened years prior to the interview. It was for this reason that the

observational method of stimulated recall was used in this study. Future research should investigate what skills are being taught in effective public school programs, to see if there are correlations between those concepts and the ones utilized by artist-level musicians.

A great deal of research exists that explores the differences in observable behaviors of expert versus novice teaching, performing, conducting, etc. In a pilot project that included college students enrolled in a performing jazz ensemble, results revealed much higher instances of scale and chordal concept categories with much lower frequencies of the memorized lick category. Investigations should be made into the musical concepts that novice jazz performers employ while improvising. Subsequent comparisons can be made to the present and similar research to aid teachers in the implementation of pedagogical methods that will foster better results for aspiring jazz improvisers.

As mentioned in the limitations, results from the present study might be skewed as a result of the participant's educational backgrounds. It is possible that many of the professional jazz musicians that perform regularly today received formal training at an institution of higher learning. Future research should be completed to examine any differences that might exist among professional improvisers without any formal training.

“Take the 'A' Train” was selected because of its varied harmonic changes, especially the altered ii chord in the 3rd and 4th measures. This jazz standard requires more from improvisers than simply blanketing riffs over a diatonic scale. Further research should be completed to examine the musical concepts professionals employ while improvising songs from other styles of jazz, such as the blues, bebop, and avant-garde.

The interactions among improvisers and the rhythm section provide a great deal of spontaneity and excitement in live performances. While this study lacked that spontaneity with

the recorded track, several participants reported listening and reacting to what was being played in the accompaniment. Future research should investigate the effects of a live rhythm section on the musical concepts that are employed during an improvised solo.

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APPENDIX A: PARTICIPANT BIOGRAPHIES

Chris Brubeck

Chris Brubeck is a performer (trombone, bass, piano, guitar, singer), composer, and band leader. He actively tours and records throughout the world with the Brubeck Brothers Quartet, a jazz combo founded by he and his brother Dan, as well as Triple Play, a blues/jazz/folk trio with guitarist Joel Brown and harmonica "virtuoso" Peter Madcat Ruth. He has recorded over 40 albums with a variety of combos and orchestras. Brubeck is an award winning solo and orchestral composer. In 2007 he was the recipient of the ASCAP Deems Taylor Award for best composition for a television audience. Several world renowned symphony orchestras have commissioned and premiered new works by Brubeck, including the Boston Pops Orchestra, the Czech Symphony Orchestra, the Concord Chamber Music Society, and the London Symphony Orchestra. Many other premiere orchestras have performed his compositions, including Houston, Baltimore, Pittsburgh, Washington, the Royal Philharmonic Orchestra, the Russian National Orchestra, and the Singapore Chinese Orchestra. Brubeck has also collaborated with a variety of talented popular music artists, including Meryl Streep, Willie Nelson, B.B. King, Bela Fleck, Bobby McFerrin, Tower of Power, and Patti Labelle. *DownBeat* wrote that "Chris Brubeck is probably one of the finest performing jazz trombonists around today," and the *Los Angeles Times* wrote that "Chris has become one of the most capable electric bassists, delivering imaginative solos." (Brubeck, n.d.)

Jack Cooper

Dr. Jack Cooper is a performer (saxophone, flute, clarinet), composer, and educator. He received his Bachelor of Arts and Master of Arts from California State University, and his Doctorate of Musical Arts from the University of Texas in Austin. Cooper toured and recorded with the U.S. Army "Jazz Knights" from 1989 to 1995. He continues to perform with a variety of jazz and popular music artists, including Manhattan Transfer, Smokey Robinson, Kenny Rogers, Ray Romano, Macey Gray, Brian McKnight, the Temptations, Tim Hagens, Peter Erskine, Marvin Stamm, Bobby Shew, Mulgrew Miller, Gary Foster, Benny Powell, and Christian McBride. Cooper's original compositions and arrangements have been performed and recorded by a variety of music ensembles, including the Dallas Wind Symphony, the Westchester Jazz Orchestra, the Woody Herman Orchestra, the Memphis Symphony Orchestra, the Grand Junction Symphony, the Summit Jazz Orchestra (Germany), the U.S. Army "Jazz Ambassadors," the U.S. Navy "Commodores," the Rob Parton Jazz Orchestra, the Cavini String Quartet, the Ceruti String Quartet, Alma Latina, and DEKA Jazz and the Brass 5. Cooper is a staff arranger and clinician for Alfred/Belwin Jazz Publications. He is also the founder and musical director of the Jazz Orchestra of the Delta. He currently serves as the Jazz and Studio Music Area Coordinator for the University of Memphis where he has taught since 1998. In 2010 the University of Memphis awarded him the Alumni Association Distinguished Achievement in the Creative Arts Award. (Cooper, n.d.)

Victor Goines

Victor Goines is a performer (Saxophone and Clarinet), composer, and educator. He received his Bachelor of Music Education degree from Loyola University and his Master of Music from Virginia Commonwealth University. Goines actively tours around the world as a member of the Lincoln Center Jazz Orchestra. He also currently tours with the Wynton Marsalis Jazz Septet, and is the founder and band leader of the Victor Goines Quintet/Quartet. He has recorded over 50 albums with a variety of jazz combos, big bands, and orchestras. He has also performed on a number of movie and television soundtracks. In 1991 he was the winner of the New Orleans City-Wide Jazz Saxophone Competition, as well as the Best of New Orleans Jazz Competition. Goines has performed with many acclaimed jazz and popular artists, including Terence Blanchard, Ruth Brown, Dee Dee Bridgewater, Ray Charles, Eric Clapton, Bo Diddley, Bob Dylan, Dizzy Gillespie, Freddie Green, Lionel Hampton, Freddie Hubbard, B.B. King, Lenny Kravitz, Branfrod Marsalais, Ellis Marsalis, James Moody, Willie Nelson, Dianne Reeves, Marcus Roberts, Diana Ross, The Four Tops, The Temptations, Stevie Wonder, Chick Corea, Ahmad Jamal, Jimmy Heath, Benny Golson, Joe Henderson, Shirley Hom, Natalie Cole, and Paul Simon. Goines has composed over 70 original works, including a commissioned piece by the Julliard Dance Division, in celebration of their 50th Anniversary. Goines has been the Director of Jazz Studies and Professor of Music at Northwestern University in Evansville, Illinois since 2007. He also served for seven years as Artistic Director of Jazz Studies at the Julliard Institute of Musical Art. Goines is an active clinician for a variety of foundations, associations, camps, and universities. (Goines, n.d.)

Geoffrey Haydon

Haydon is a performer (piano), composer/arranger, educator, and published author. He received his Bachelor of Music degree from the University of Richmond, and his Masters and Dotorate of Musical Arts from the University of Texas in Austin. Haydon has performed around the world as a classical and jazz soloist. He also performs with the Haydon-Lyke Piano Duo, the American Music Trio, the Haydon/Parker Duo, the McLean-Haydon Jazz Quartet, and the Georgia State University Faculty Jazztet. He has also toured with productions of *The Phantom of the Opera*, *The King and I*, *The Producers*, *Hairspray*, *Sister Act*, and *Grease*. He has performed with many accomplished jazz artists, such as Eddie Daniels, Joe Henderson, Bill Watrous, Marvin Stamm, Nick Brignola, Randy Brecker, Indugu Chancler, Conrad Herwig, and Hal Crook. He has recorded albums with the McLean-Haydon Jazz Quartet and the Haydon/Parker Duo. Haydon has been published by several companies as author, co-author, and co-arranger of text books and solo and duet piano books. Haydon is also an active clinician and adjudicator. Haydon currently serves as Associate Professor of Music at Georgia State University where he teaches piano performance and jazz piano. (Haydon, n.d.)

Lawrence Panella

Panella is a performer (saxophone, clarinet, flute), and educator. He received his Bachelor of Music from the University of Texas in Austin, and his Master of Music degree from Northern Illinois University. While at the University of North Texas, Panella toured and recorded with the One O'clock Lab Band. He has also performed with a variety of popular artists and jazz big bands, including the Phil Collins Big Band, the Woody Herman Orchestra, Natalie Cole, Steve Allen, Nelson Riddle, and Frank Sinatra Junior. He is founder and bandleader of the USM Jazz Quartet. He has recorded albums with the USM Jazz Quartet, the Collection Jazz Orchestra, the Ashley Alexander Big Band, and the Phil Collins Big Band. Panella is currently an Associate Professor of Music and the Director of Jazz Studies at the University of Southern Mississippi. Panella was also a faculty member at Wheaton College Conservatory and Northern Illinois University, prior to his current position. (Panella, n.d.)

Don Parker

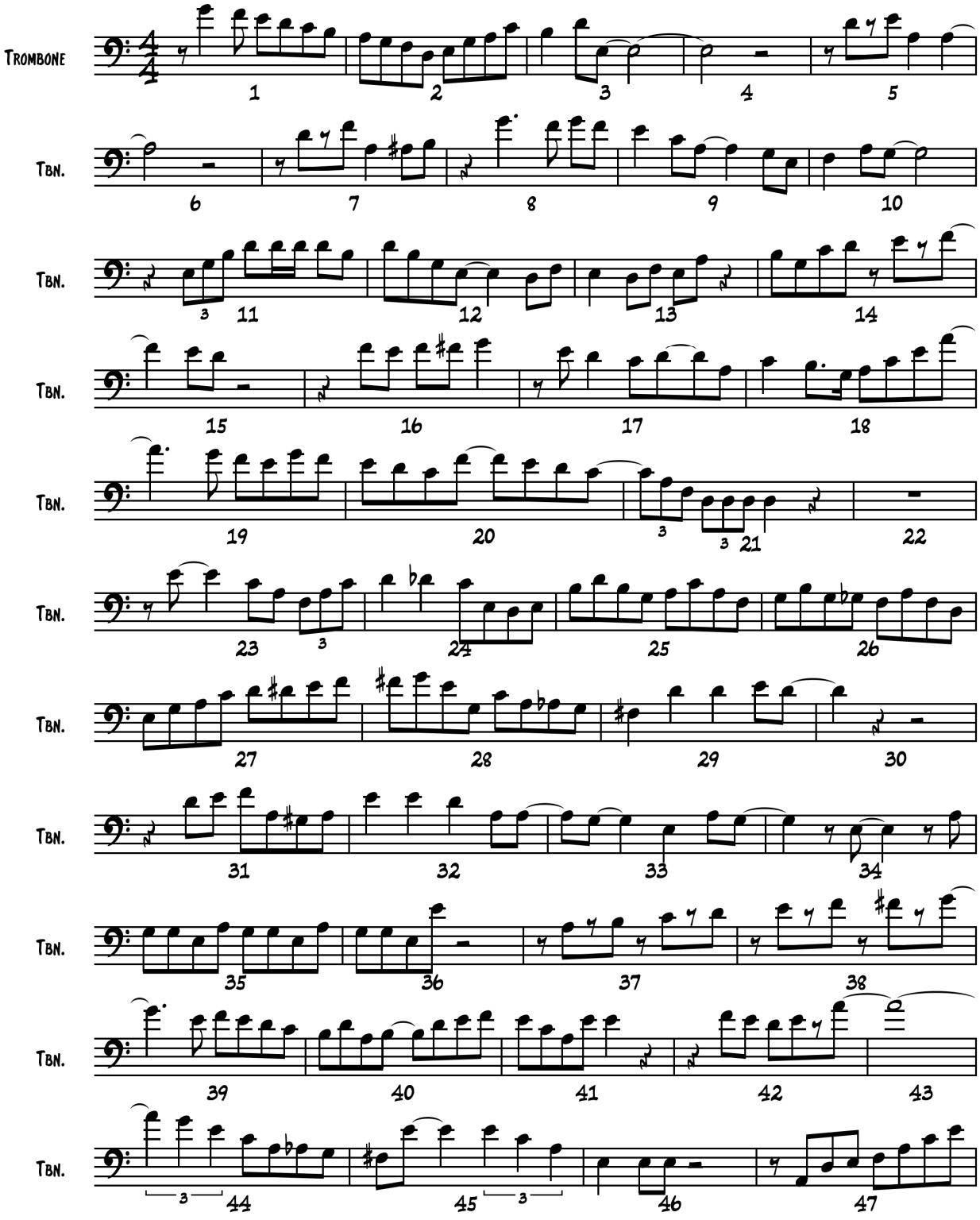
Parker is a performer (percussion), educator, and author. He received his Bachelor of Music Performance and Music Business from Depaux University, and his Master of Music and Doctorate of Musical Art from the University of Texas in Austin. Parker performs and records with the Fayetteville Jazz Orchestra, and is the principle percussionist for the Fayetteville Symphony Orchestra. He also performs and records with two chamber ensembles, a jazz combo called the Haydon/Parker Duo featuring Geoffrey Haydon on piano and Parker on vibraphone, as well as a contemporary and traditional chamber duo called Double Take that features Parker on a variety of percussion instruments, and Sheryl Linch on trumpet. Parker was asked to contribute to the GIA publication, *Teaching Music through Performance in Jazz*. He is an active clinician, guest artist, and adjudicator throughout the United States. He currently teaches percussion studio, class percussion, percussion pedagogy, percussion ensemble, music history, and assists with the Marching Bronco Express at Fayetteville State University in Fayetteville, North Carolina.

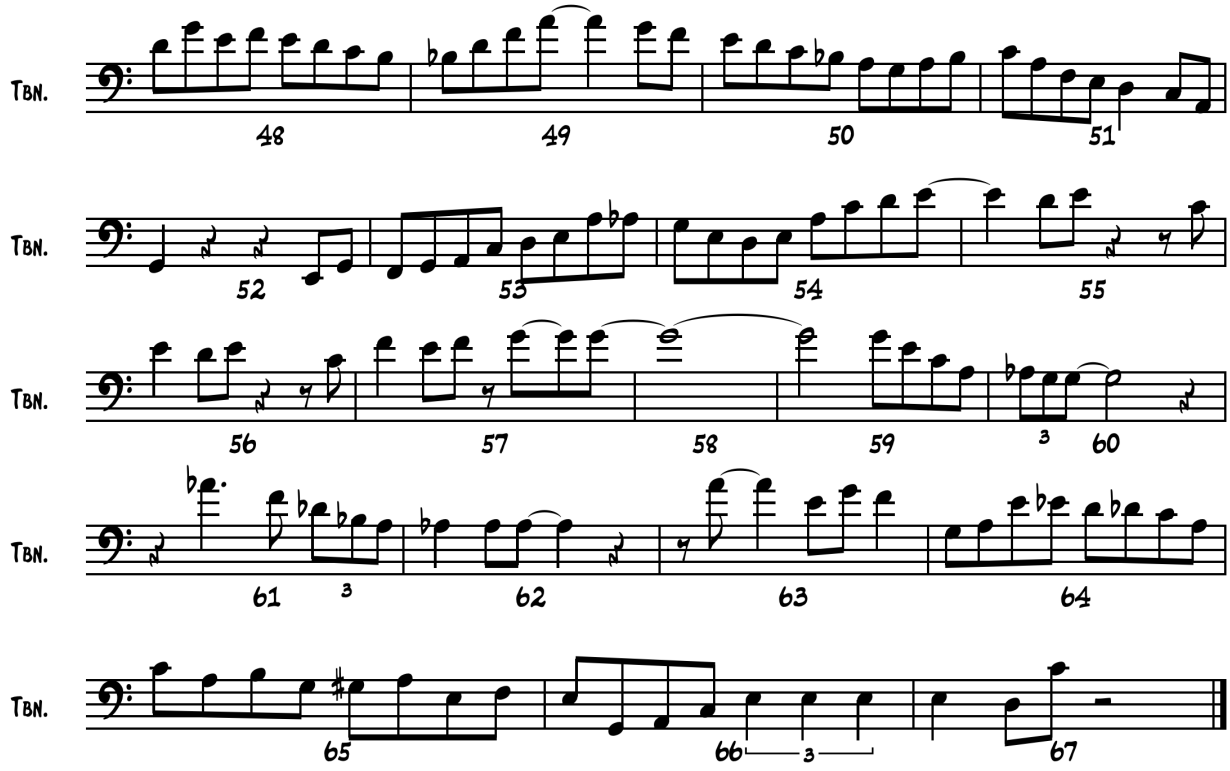
David Spencer

Spencer is a performer (trumpet), educator, and school music curriculum coordinator. On sabbatical from the University of Memphis, he currently serves as the Director of the Music Academy Escola American in Campinas, Brazil. Spencer received his Bachelors of Music from Florida State University, and his Master of Music and Doctorate of Musical Art from the University of North Texas, where he was a member of the One O'clock Lab Band. Spencer has performed on a number of classical, popular, and film recordings. Spencer performed with the Seoul Philharmonic Orchestra, the Manhattan Chamber Orchestra, and the Sinfonica de Asturias in Spain as principal trumpet. He has also performed with several renowned jazz musicians, including Freddie Hubbard, Michael Brecker, James Moody, and Marvin Stamm. Spencer is an sought-after clinician, presenting master classes at universities all over the world. He was elected to serve on the board of directors for the Memphis chapter of the National Academy of Recording Arts and Sciences. Spencer is an Associate Professor at the University of Memphis where he is the trumpet studio director. He also teaches conducting and music repertoire at the university.

APPENDIX B: COMPLETE TRANSCRIBED SOLOS

Chris Brubeck

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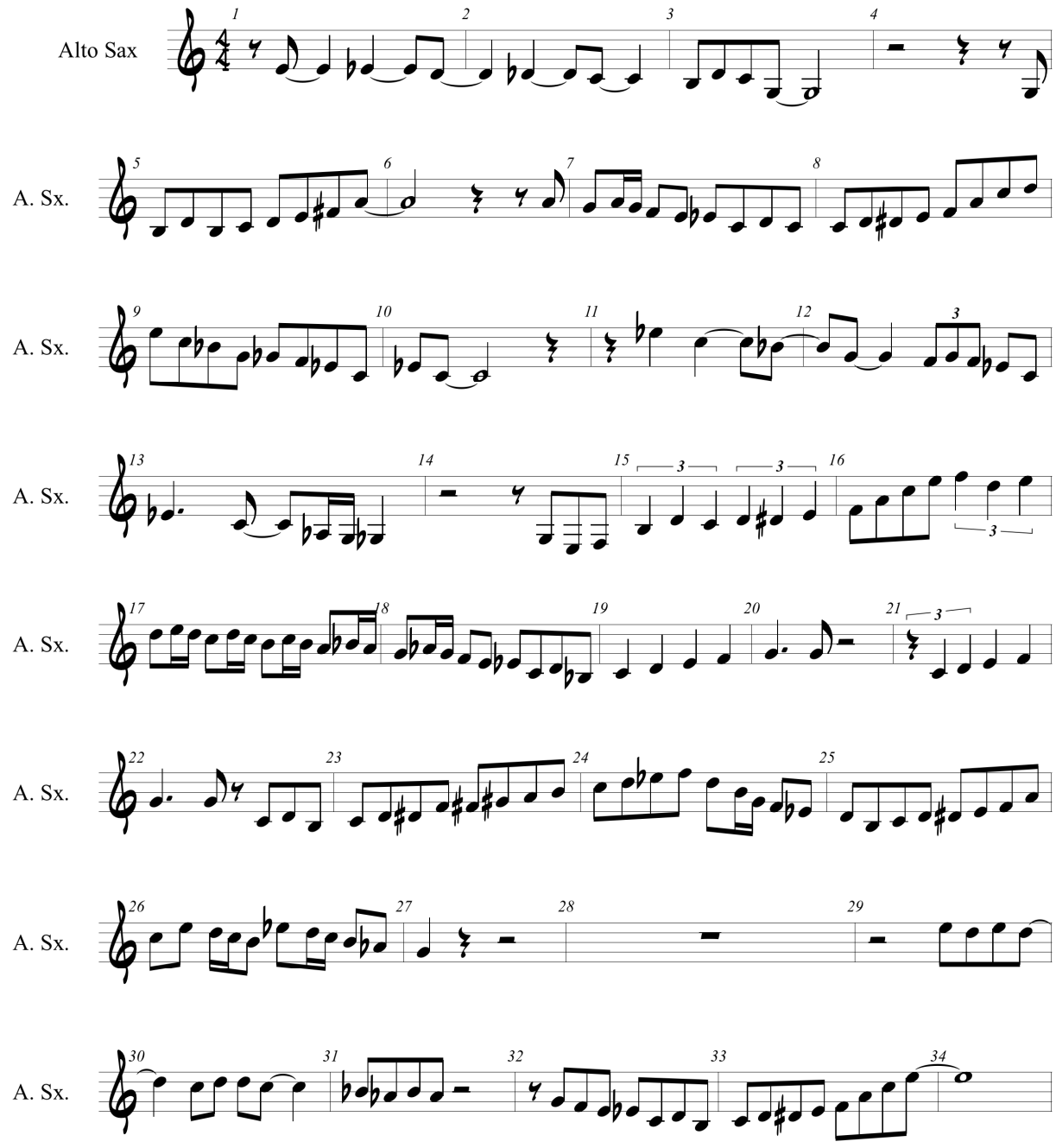
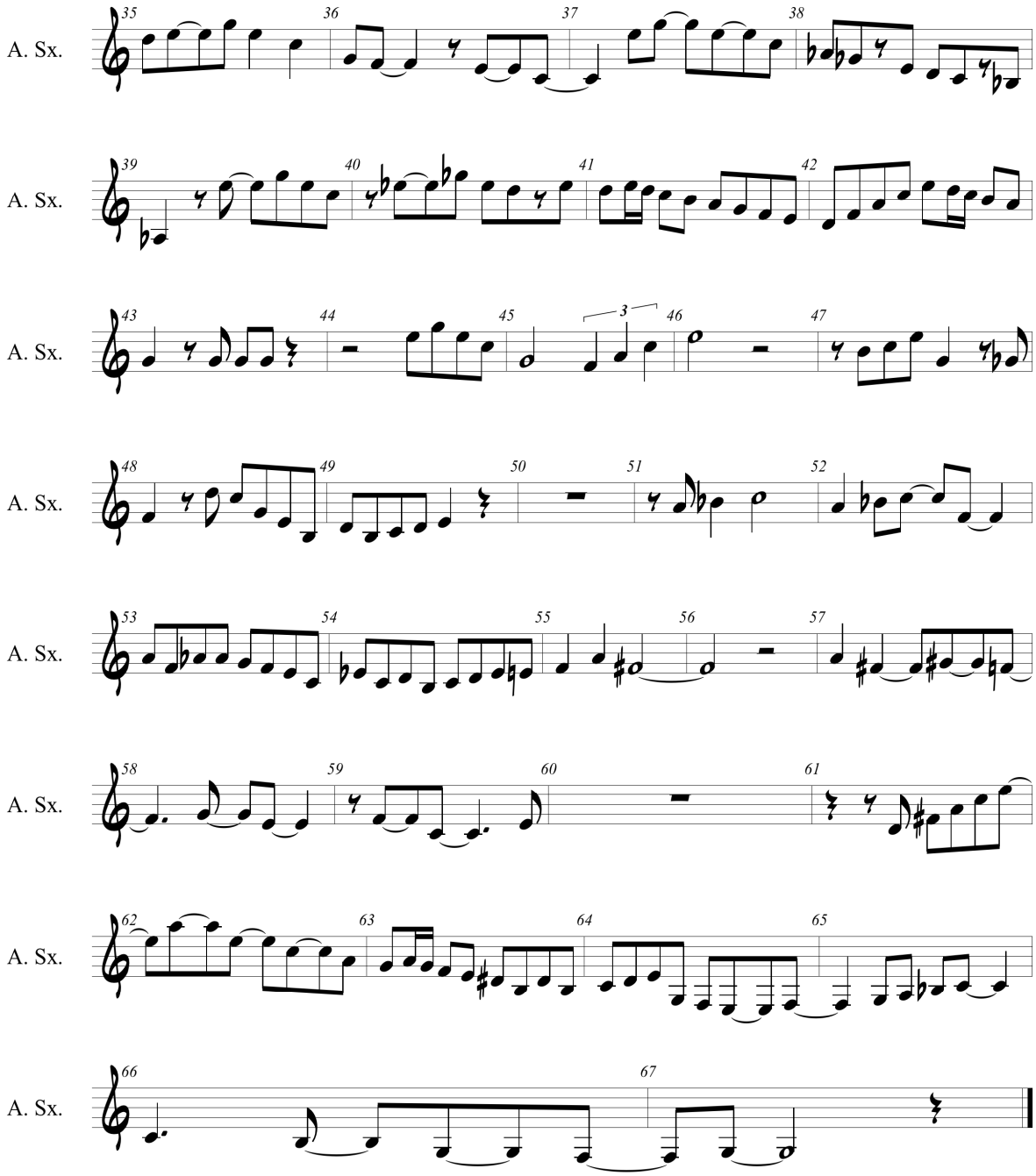
Jack Cooper

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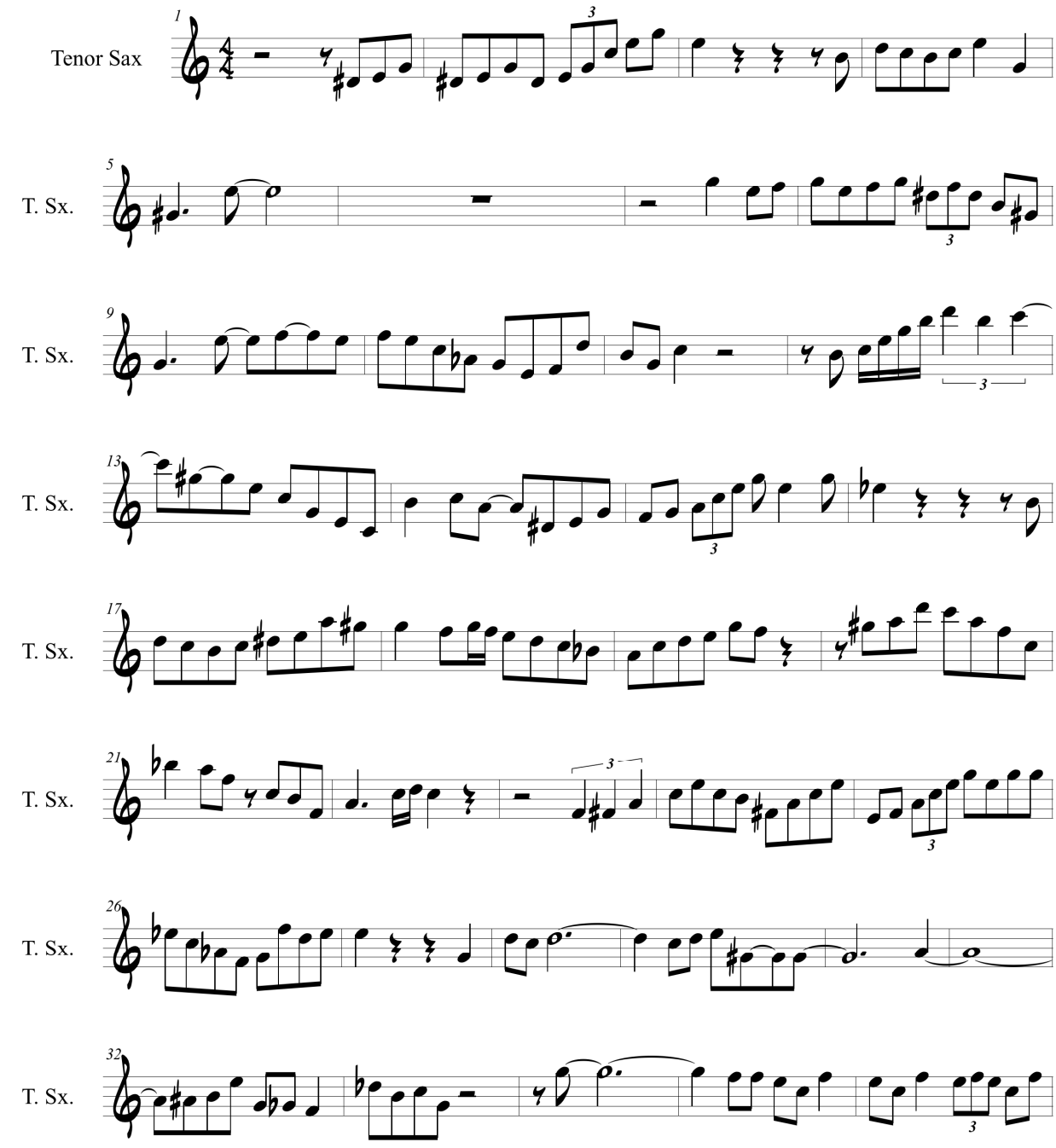
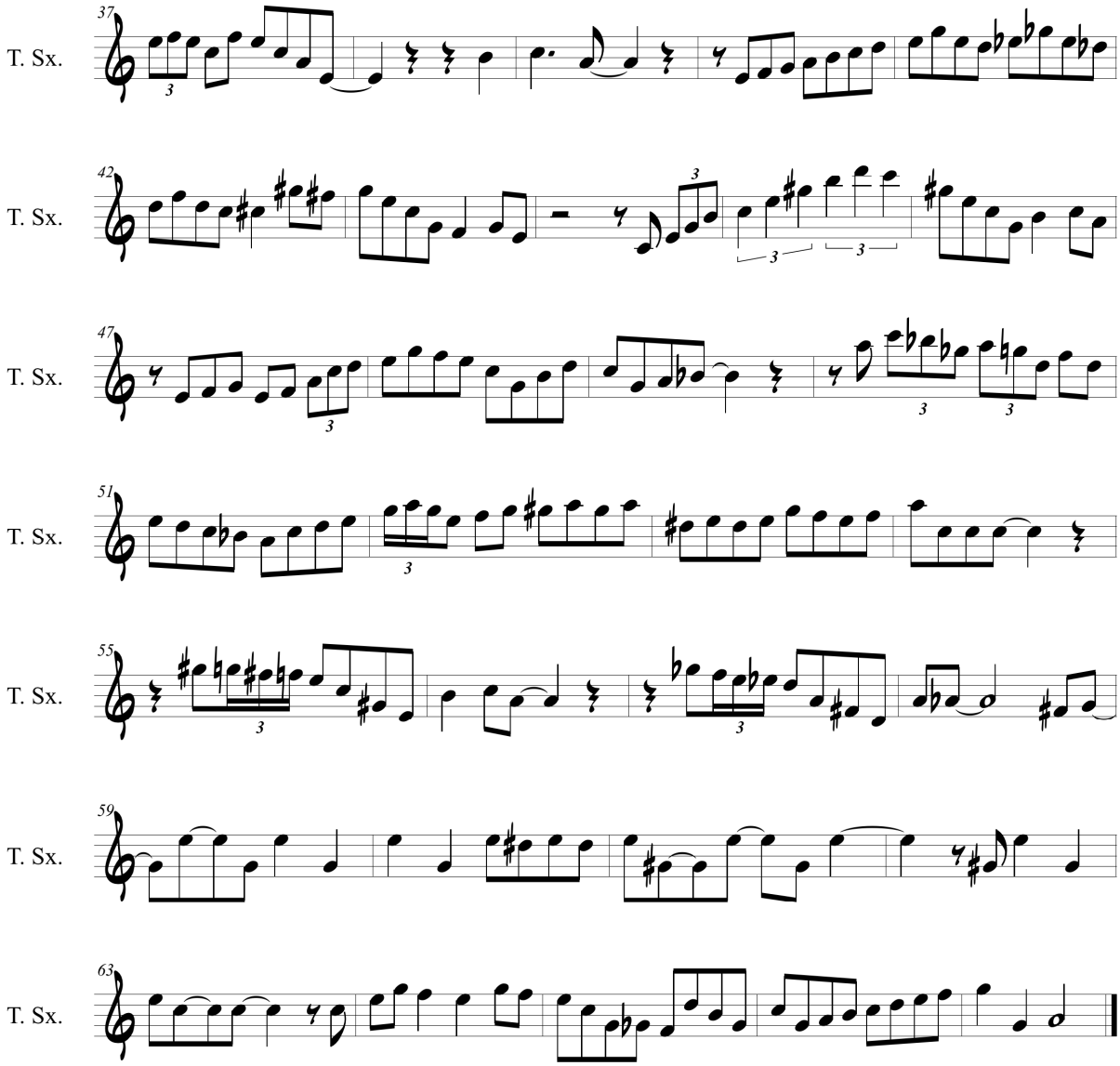
Victor Goines

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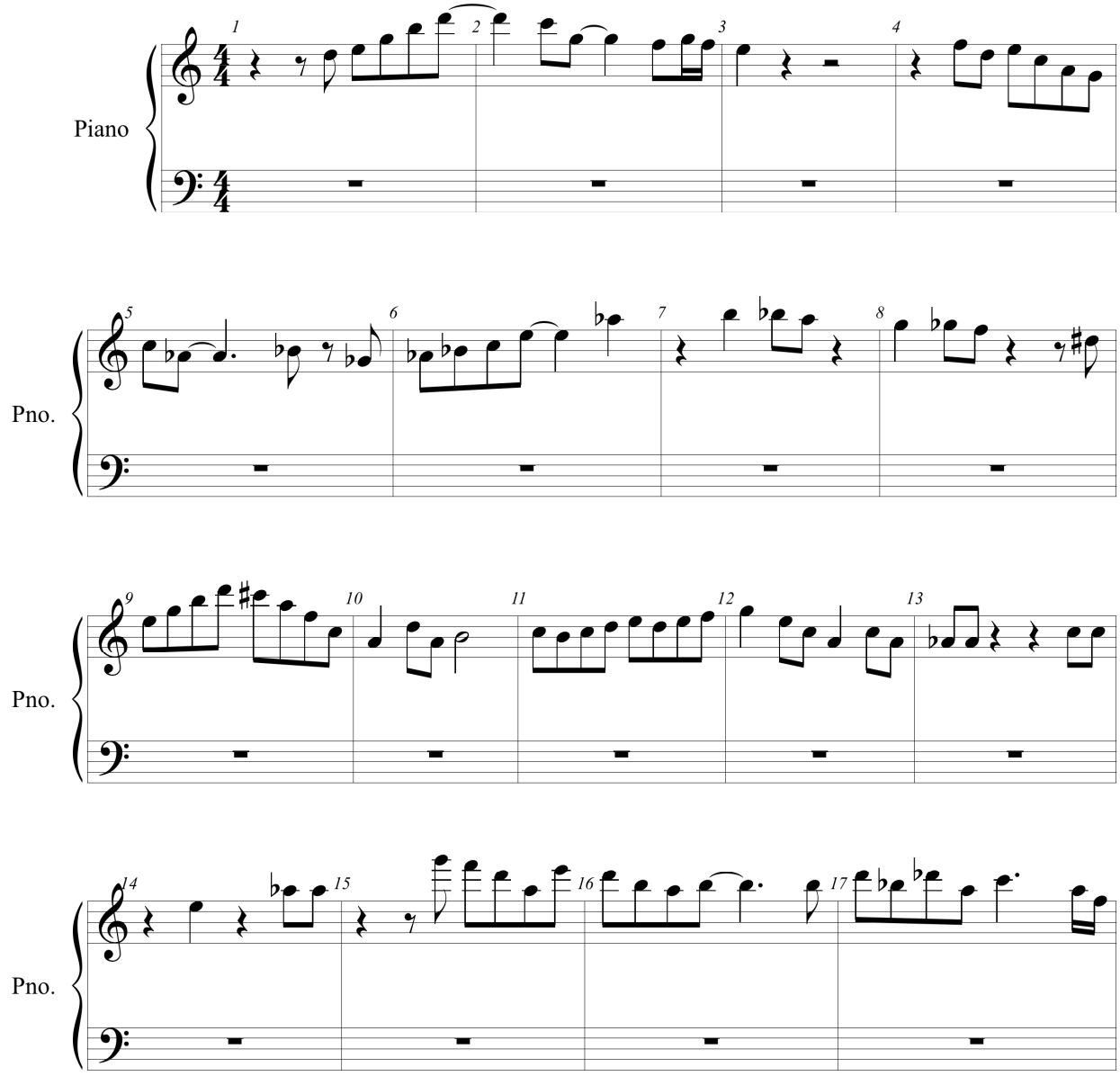
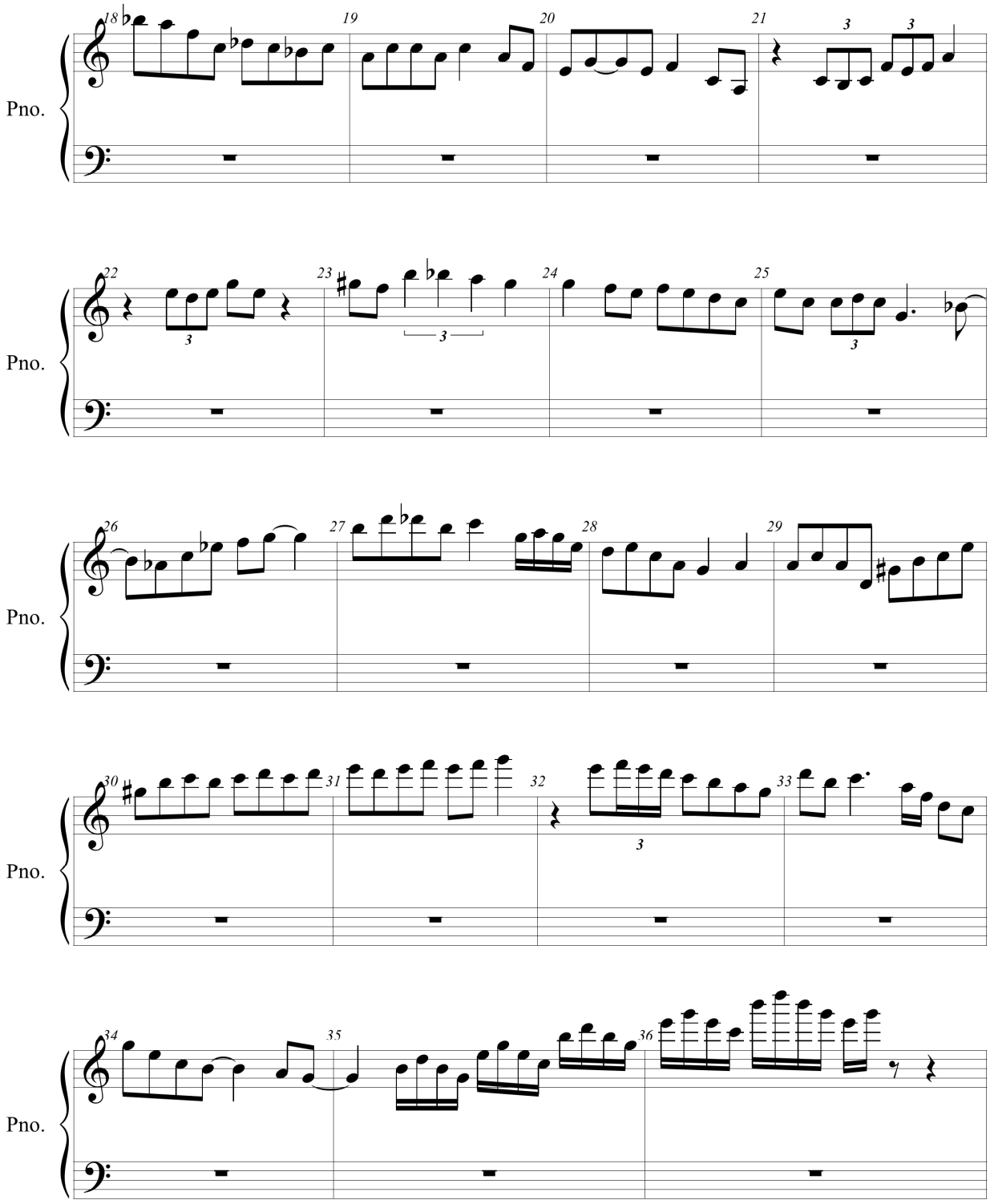
Geoffrey Haydon

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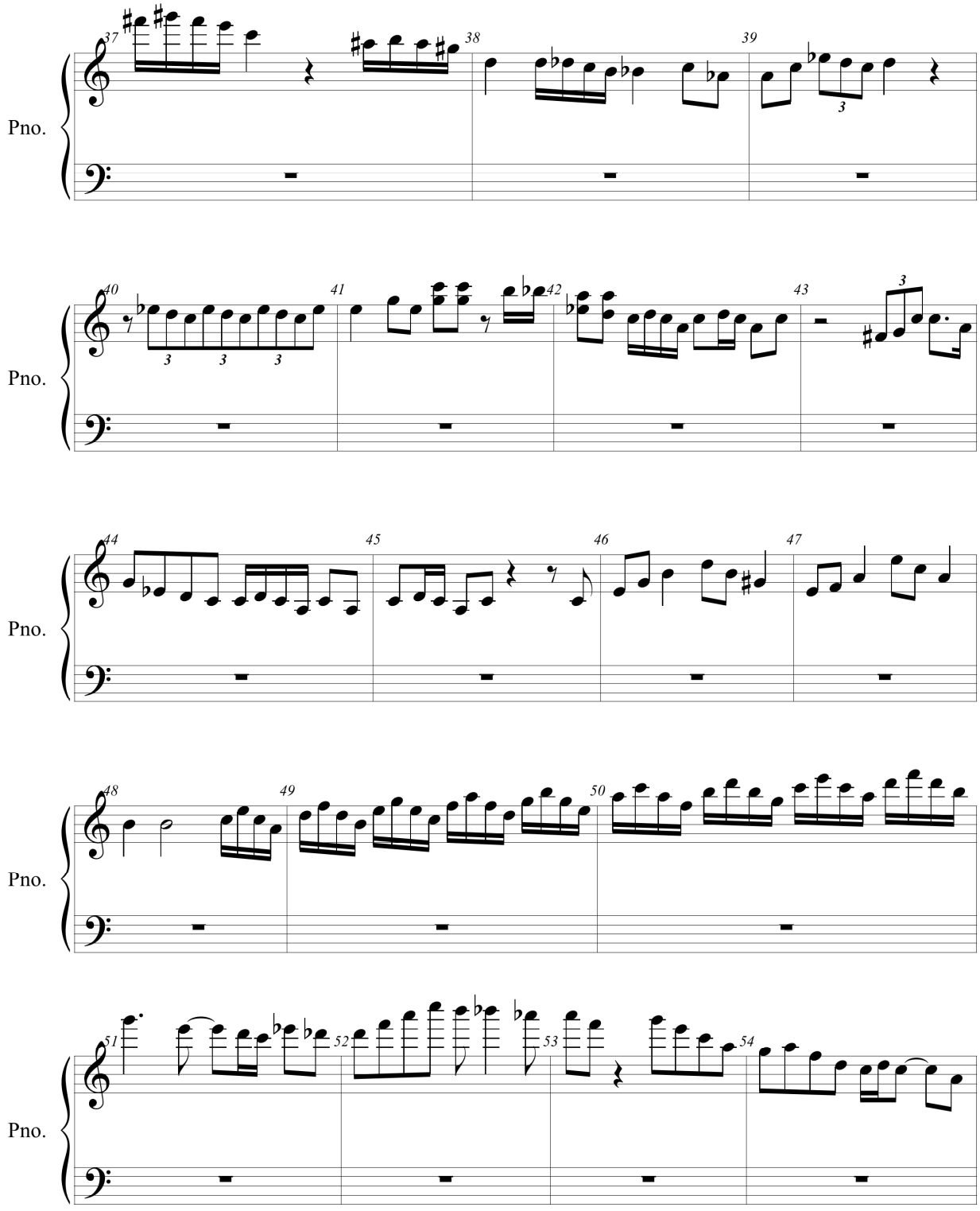
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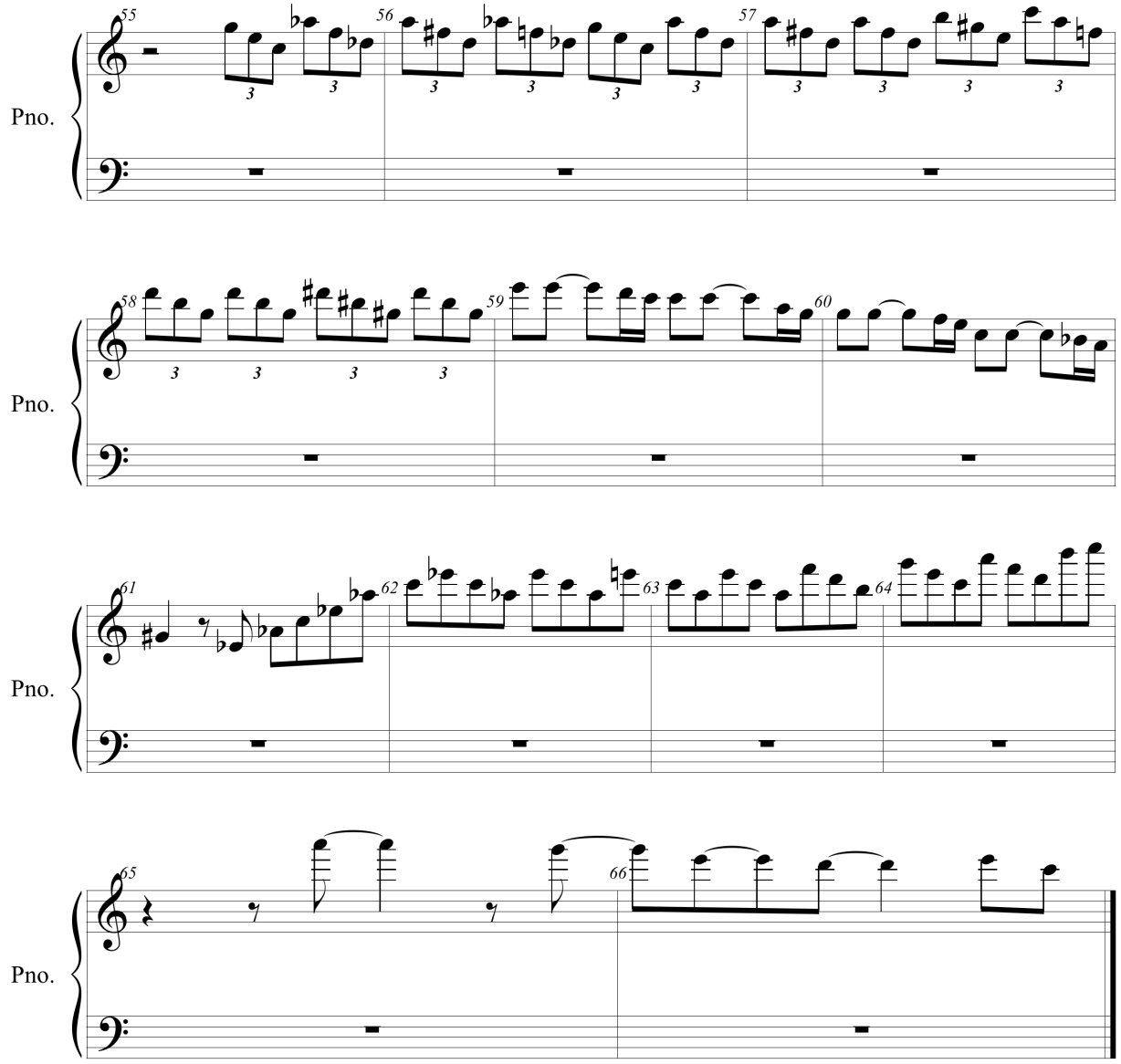
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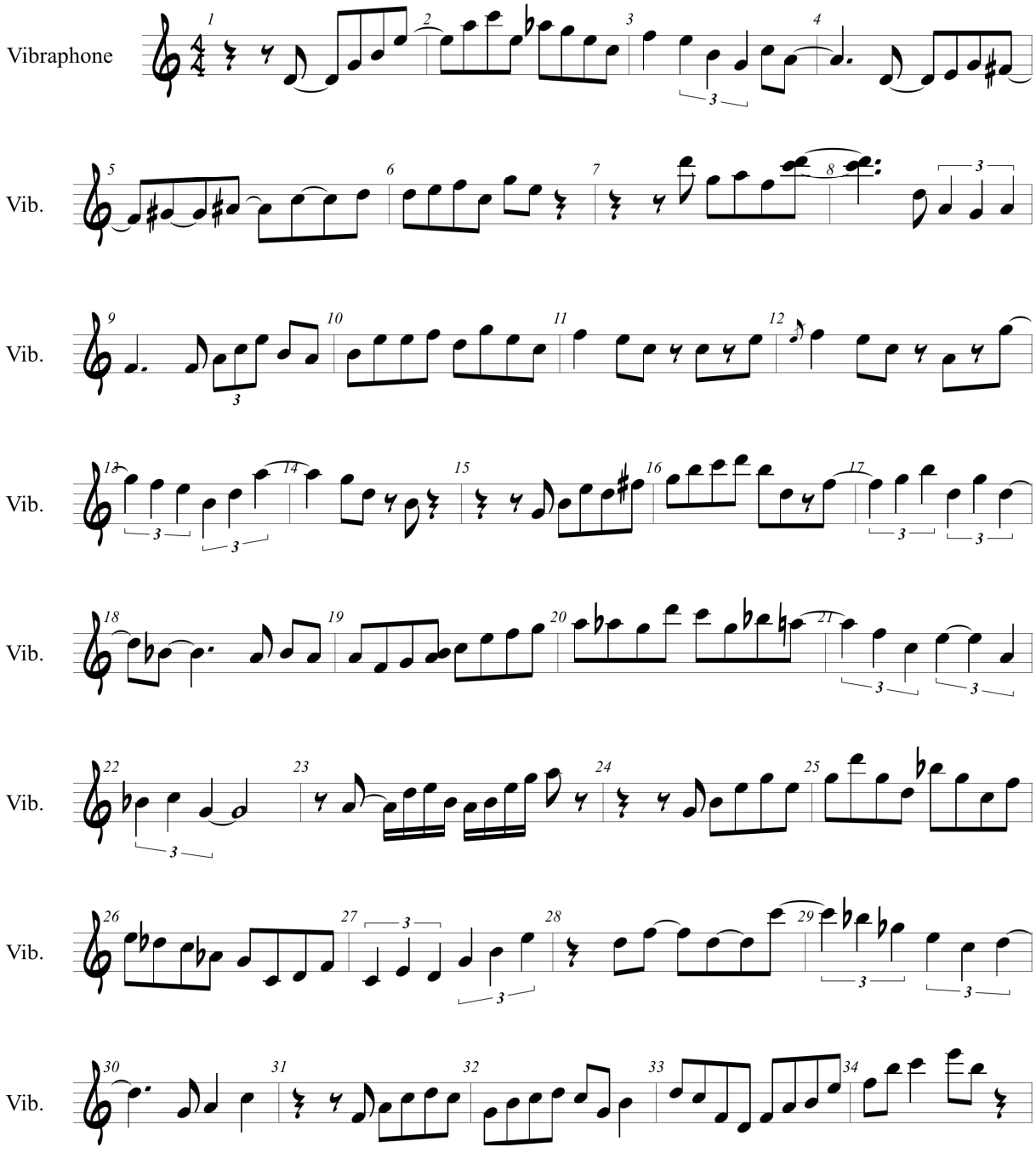
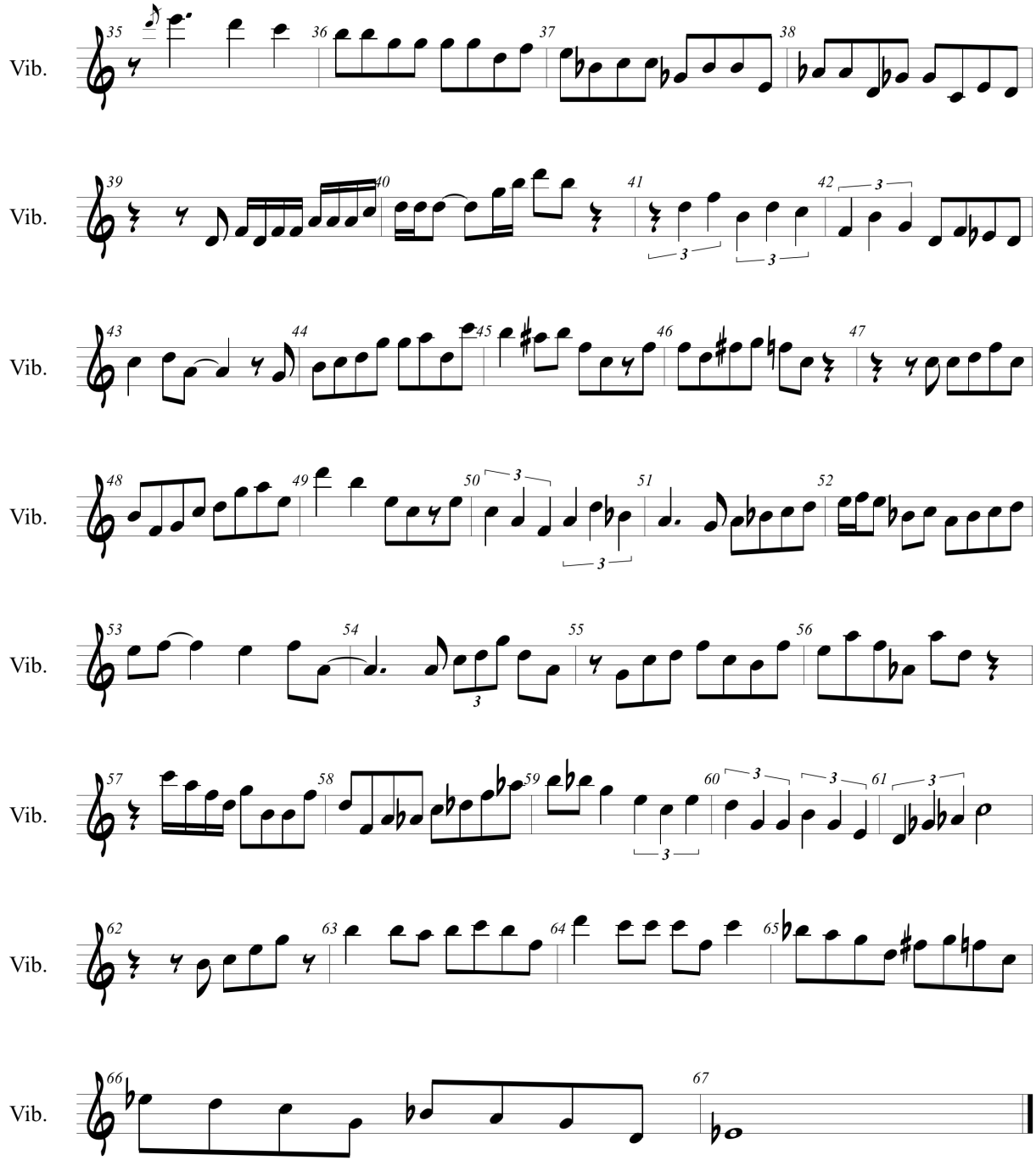
Don Parker

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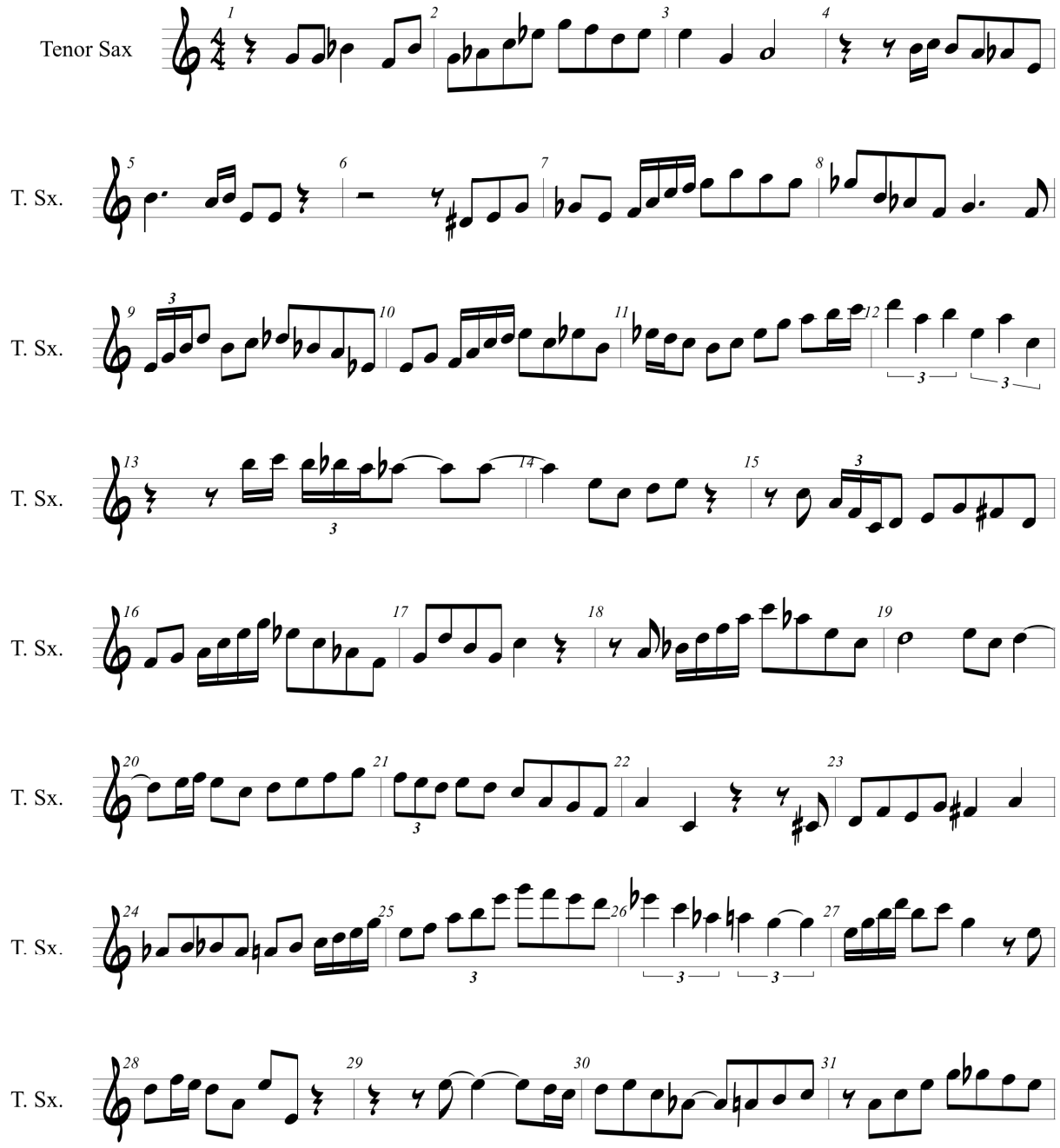
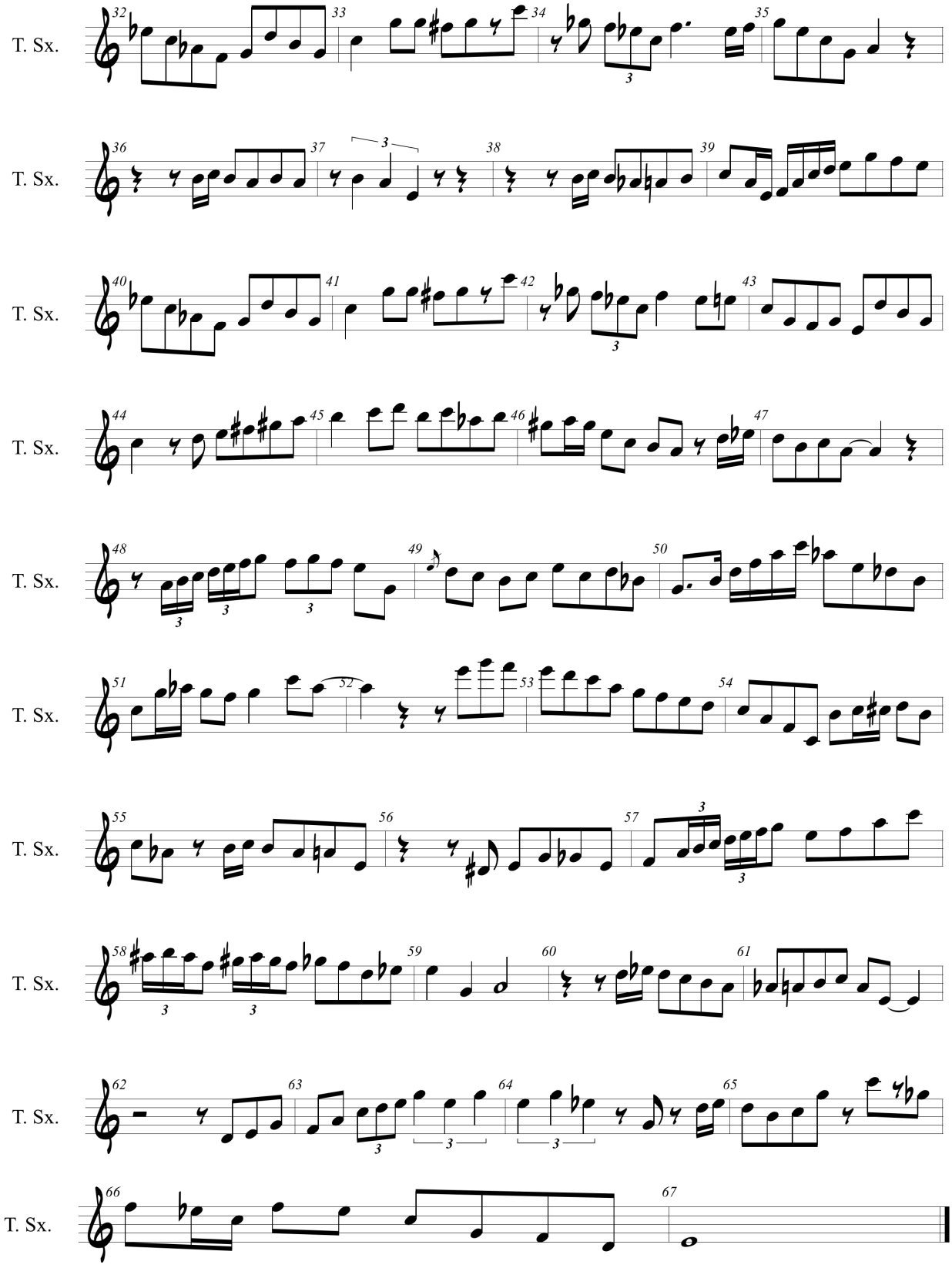
Lawrence Panella

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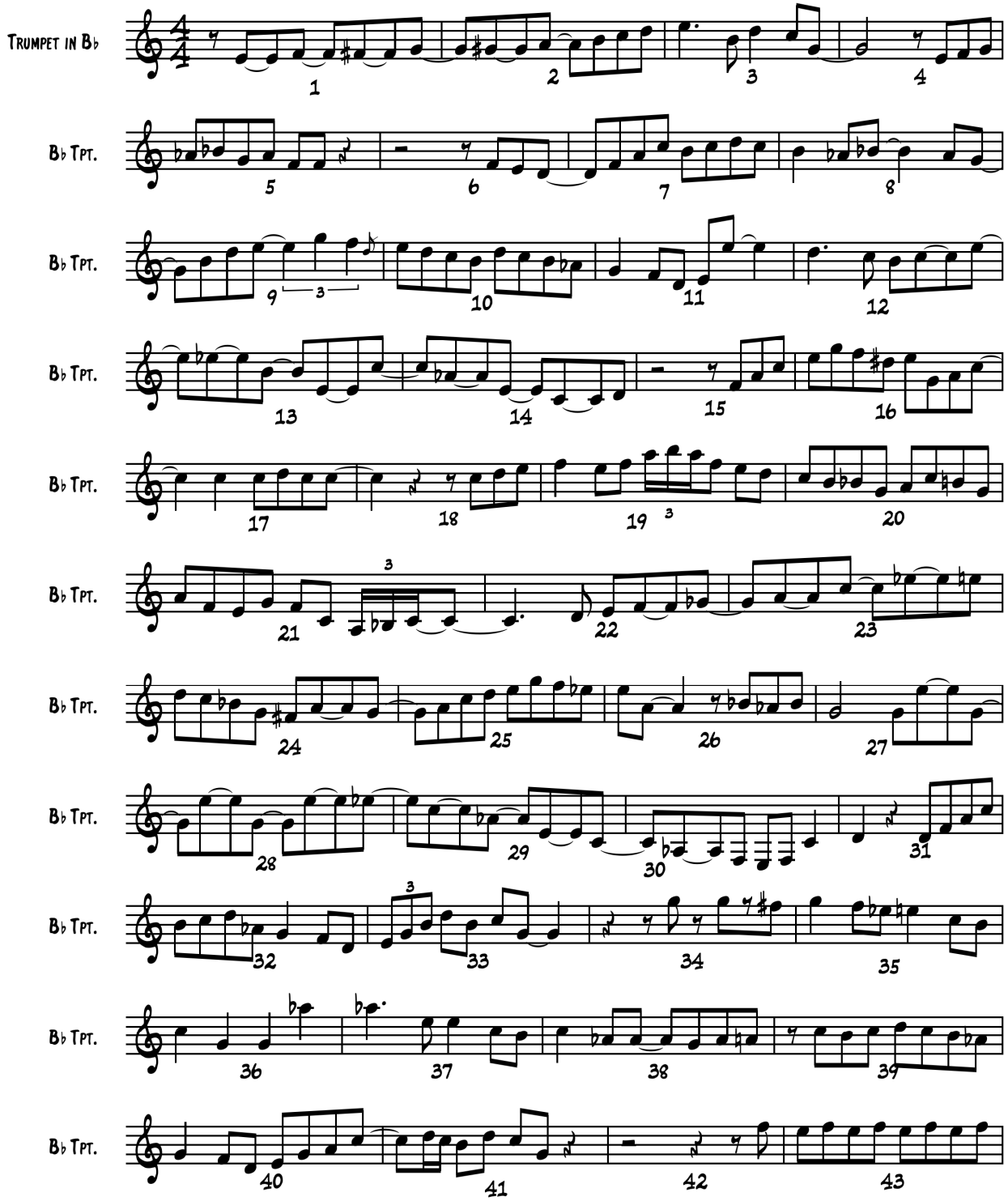
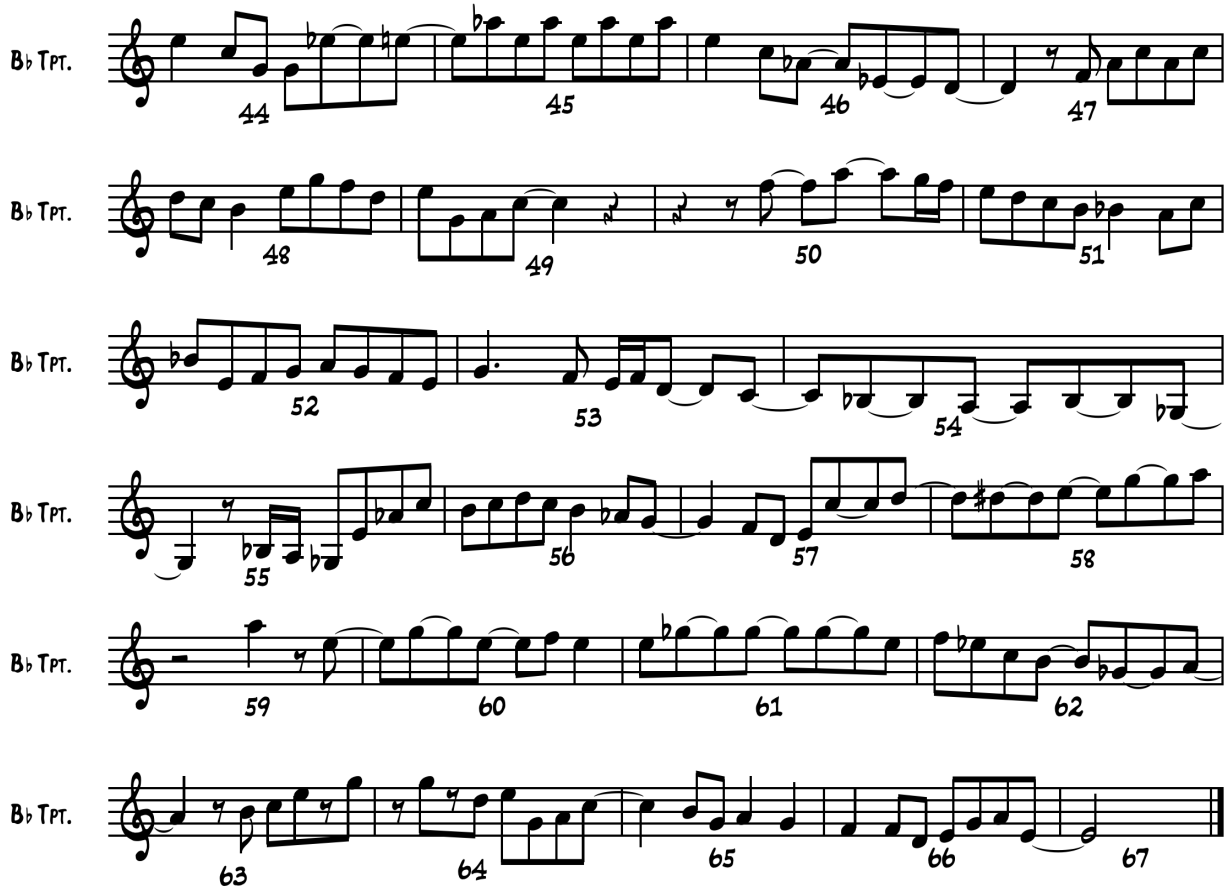
David Spencer




B♭ Tpt.
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VITA

Jonathan Whitmire was born in Shattuck, Oklahoma on May 26, 1978, and grew up in Woodward, Oklahoma. He received a Bachelors of Music Education in Instrumental Music and a minor in Vocal Music Education from Southwestern Oklahoma State University in 2002, where he studied under Dr. James South, Dr. Debra Spurgeon, and Dr. Alan Spurgeon. He then attended the University of Mississippi for his Master of Music in Music Education, again studying with Dr. Alan Spurgeon as well as Dr. Michael Worthy. In 2004 he taught middle school choir and general music at Oxford Middle School for one year, before leaving Mississippi to teach junior high and high school band at Perryton, Texas. In 2008 he again enrolled at the University of Mississippi to pursue a Doctor of Philosophy in Music Education, with a secondary emphasis in trumpet performance under Dr. John Schuesselin. He is currently the K-5 violin teacher at George H. Oliver Arts Magnet School in Clarksdale, Mississippi.