JAZZ

forschung / research

JAZZ JOURNEYS

Edited by Christa Bruckner-Haring and André Doehring

HOLLITZER

Jazzforschung / Jazz Research

50/51

herausgegeben von

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für das Institut für Jazzforschung an der
Universität für Musik und darstellende Kunst Graz (KUG)
und die Internationale Gesellschaft für Jazzforschung (IGJ)

edited by

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Together, they co-edit the publication series *Jazzforschung / Jazz Research* and *Beiträge zur Jazzforschung / Studies in Jazz Research*.

JAZZ JOURNEYS

JAZZFORSCHUNG / JAZZ RESEARCH 50/51

Universität für Musik und darstellende Kunst Graz

Land Steiermark, Referat Wissenschaft und Forschung

Internationale Gesellschaft für Jazzforschung

Contents

Vorwort

In *Jazz Journeys* geht es um den Einfluss von Reisen und Migration auf Jazz und unser Verständnis dieser Musik. Auch das Buch selbst hat eine lange Reise hinter sich: Geplant anlässlich des 50. Jubiläums der Internationalen Gesellschaft für Jazzforschung (IGJ) und als Tagungsband der sechsten Rhythm Changes Konferenz "Jazz Journeys", die 2019 an der Universität für Musik und darstellende Kunst Graz stattfand, hat es doch recht lange gedauert, bis wir die Abstracts und vollständigen Artikel der über 200 Teilnehmer★innen beisammen hatten, diese durch das Peer-Review-Verfahren bringen und die schließlich ausgewählten Kapitel für die Publikation vorbereiten konnten. Pandemische Jahre und neugeborene Familienmitglieder mögen zur Verzögerung dieser Reise beigetragen haben, aber schließlich sind wir erfolgreich an unserem Ziel angekommen: ein Buch zu präsentieren, das Forschung über Jazz an Orten und in Räumen enthält, die bisher nicht auf der Landkarte der Jazzforschung verzeichnet waren.

Während wir dieses Vorwort schreiben, sind wir mit dem Auto und Zug in Europa unterwegs, einem Kontinent, in dem unweit von Graz ein Krieg tobt. Mobilität, das Reisen und Migration sind nicht nur wichtige Themen des Jazz und der Jazzforschung, sondern auch in ihrer Bedeutung für die Art und Weise, wie wir als Gesellschaft leben wollen, nicht zu unterschätzen. In einer Zeit, in der Nationalismus und Populismus auf dem Vormarsch sind und freies Reisen für viele Menschen ein zunehmend schwieriges Unterfangen wird, soll dieses Buch dazu einladen, über die schönen, mitunter auch herausfordernden Aspekte von unterschiedlichen Begegnungen im Jazz über Kontinente, Genre- oder Geschlechtergrenzen hinweg zu reflektieren.

Wir danken allen Autor★innen sowie den Gutachter★innen für ihre Beiträge zu diesem Buch und für ihre Geduld, wie auch dem Rhythm Changes Konferenzkomitee für die wertvollen Anregungen und die stets gute Zusammenarbeit. Darüber hinaus bedanken wir uns herzlich für die Unterstützung dieser Publikation durch die Universität für Musik und darstellende Kunst Graz, die IGJ und das Land Steiermark. Vor allem aber gilt unser Dank den Kolleg★innen des Instituts für Jazzforschung, die uns redaktionell bei den umfangreichen Vorbereitungen dieses Doppelbandes der *Jazzforschung / Jazz Research* eine große Hilfe waren: Benjamin Burkhart, Elisabeth Kappel und Lukas Proyer. Ohne euch wäre dieses Buch nicht möglich gewesen!

Christa Bruckner-Haring, André Doehring

Foreword

Jazz Journeys is about the impact of travel and migration on jazz and on our understanding of the music. The book itself has had a long journey, too: Planned in celebration of the 50th anniversary of the International Society for Jazz Research (ISJ) and as proceedings of the Sixth Rhythm Changes Conference "Jazz Journeys," which took place at the University of Music and Performing Arts Graz in 2019, it took quite a while to gather abstracts and full articles from the over 200 participants, organize peer reviews, and prepare the selected chapters for publication. The pandemic years and newborn family members may have played a role in the journey's delay, too, but we have finally arrived at our destination: to present original research about jazz in places and spaces hitherto missing from the maps of jazz studies.

As we are writing this introduction on the road, travelling through Europe by car and train with a war raging not far from Graz, it's hard to overstate the importance of mobility, travel, and migration – not just for jazz and jazz studies, but also for the way we want to live as a society. With nationalism and populism on the upswing and free travel becoming increasingly difficult for many, this book invites us to consider both the beautiful and challenging aspects of people meeting across continents, genres, and gender boundaries to play and enjoy jazz together.

We would like to thank all authors and peer reviewers for their contributions to this book and for their patience, as well as the Rhythm Changes conference committee for their valuable input and cooperation. Furthermore, we thank the University of Music and Performing Arts Graz, the ISJ, and the State of Styria for supporting this publication. Most of all, we are grateful for the editorial assistance we have received from our colleagues at the Institute for Jazz Research during the extensive preparations for this double issue of *Jazzforschung / Jazz Research*: Benjamin Burkhart, Elisabeth Kappel, and Lukas Proyer. This book wouldn't exist without you!

<div align="right">Christa Bruckner-Haring, André Doehring</div>

Dig That Lick: Exploring Patterns in Jazz with Computational Methods

Lucas Henry, Klaus Frieler, Gabriel Solis, Martin Pfleiderer, Simon Dixon, Frank Höger, Tillman Weyde, Hélène-Camille Crayencour

Abstract

The importance of musical patterns to jazz is well established in the scholarly literature, in musicians' discourse, and in fan lore. However, research into pattern usage has so far mostly been based on manual analyses of jazz recordings and transcriptions. This paper reports on some findings of a collaborative project on pattern usage in jazz improvisation that uses computational methods for transcription and analysis of recordings and a large database. After outlining the concept and existing research on patterns and licks in jazz improvisation, the paper introduces the approach of the project, the interactive analysis webtools, and the database that covers one hundred years of US jazz history. The authors then present three case studies: The first traces the transmission of a particular epitomic bebop lick. This lick originated with the main bebop musicians (Charlie Parker, Dizzy Gillespie) but is still used by modern post-bop players (Michael Brecker, Chris Potter). The second case study investigates a short cadential formula that is used frequently throughout jazz history and is a common building-block for longer patterns. The third example scrutinizes the concept of 'post-Coltrane' improvisation by looking at an extended ascending diatonic scale, which was played by Coltrane in his solo on "Blue Train" (1957) and later by other soloists, who are often described as 'post-Coltrane' or Coltrane-influenced.

The matter of patterns in musical improvisation has been central to jazz studies for as long as there has been academic work on the subject. Ethnographers have analyzed musicians' descriptions of learning and using licks and riffs; music theorists and cognition scholars have debated the function of patterns in improvisational creative processes. And yet, many questions remain about such material and its actual usage in jazz improvisation. How much of an improvisation is made up of stock patterns played verbatim and of patterns strongly associated with certain musicians? Do patterns and licks rise and fall in use over time? Does the extent or type of pattern use change with the stylistic context? Does pattern

usage change as musicians age? This paper reports on three case studies from a collaborative project using computational methods to answer historical and theoretical questions regarding the socio-musical role of licks in jazz. After outlining the concept and existing research on patterns and licks in jazz improvisation, we introduce the computational approach, the database, and the interactive analysis webtools. Then, in line with the theme of *Jazz Journeys*, the usage and transmission of three particular licks are traced in three case studies. The first lick originated with the main bebop musicians (Charlie Parker, Dizzy Gillespie) but is still used by modern post-bop players (Michael Brecker, Chris Potter). The second lick is a common and short cadential formula using chromatic approaches that can be found in all of jazz history. In the third case study, we scrutinize the concept of "post-Coltrane" improvisation by looking at an extended ascending Dorian scale played by Coltrane in his solo on "Blue Train" (1957). By presenting these three examples, we intend to stimulate novel research on jazz improvisation using corpus-based methods and computational tools.

Patterns – Licks

At least three terms are in common use to describe repeated melodic material from which jazz improvisers create solos: "pattern," "riff," and "lick." Of these, "pattern" is the broadest term, the least determined, and also the most commonly used. Tucker and Jackson, for instance, use it – but not "lick" – in their entry for Jazz in the *New Grove Dictionary of Music*, a standard reference work (Tucker / Jackson 2001). However, they refer exclusively to rhythmic patterns as a determinant of style in jazz. "Riff" is the narrowest and most specific of the three terms, used to describe a specific kind of pattern that is short and repetitive, most often connected with swing-era head arrangements (e.g., Shipton 2007: 306–307; Baraka 1963: 62, 170, 183, 217; Gioia 1997: 183; DeVeaux 1997: 190–192). "Lick" sits between the general "pattern" and the specific "riff." Witmer offers a clear and concise definition in a *New Grove* entry on the topic: "A term used in jazz, blues, and pop music to describe a short recognizable melodic motif, formula or phrase" (Witmer 2001: 655). Nearly every other use of the term follows this definition, albeit with some further parsing. Martin and Waters (2006) use "lick" and "formula" interchangeably. Benson (2008: 137) says,

> [a] lick can consist of a short melodic motif or a more extended unit; it may end in a full cadence, but most likely it is part of a larger melodic/harmonic scheme. The fact that licks are ubiquitous in jazz improvisations is precisely the reason that the term "lick" can mean almost any musical pattern that is in some way

recognizable and that is not, strictly speaking, part of what we might call the 'tune itself.'

Beyond simply defining licks as patterns, there seems to be a consensus that licks are learned (though sources are not always a matter of consensus), stored in the memory (though relatively few researchers have a theory of memory that would allow them to expand on this somewhat vague notion), and deployed in performance (again, how that happens is not entirely a matter of consensus).

Given these terms and definitions, we can say that there are several different types of licks/formulas/patterns, and each has been used (or could be used) to understand the creation and meaning of improvised material in jazz. We can consider those that are specific (licks, quotations, riffs that occur in whole across solos and seem to be understood as borrowed – see Berliner 1994), the generic (licks, patterns, formulas that occur in whole or in part across solos but may not be understood as borrowed – see Pressing 1988), the variant (formulas and patterns as frameworks that improvisers use to create new or seemingly new material – see Gushee 1977; Johnson-Laird 2002; Berliner 1994), the referential (quotations, patterns, or formulas that suggest a style or refer directly to another performer or work – see Berliner 1994), the intentional (deliberate choices by an artist – see Berliner 1994; Monson 1996), and the reflexive (unintentional choices made by the performer – see Norgaard 2011; Pressing 1988). These various definitions can and have been employed in various ways for various research questions.

Four basic disciplinary approaches are represented in this literature: historical (e.g., DeVeaux 1997; Gioia 1997; Shipton 2007; Martin / Waters 2006; Porter 1997), ethnographic (e.g., Berliner 1994; Baraka 1963; Sawyer 1992), critical/theoretical (e.g., Gushee 1977; Schuller 1999 [1958]; Gross 2011; Terefenko 2004; Owens 1974; Stewart 1973; Benson 2008; Kenny 1999; Smith 1983; Finkelman 1997), and cognitive (e.g., Pressing 1988; Johnson-Laird 2002; Norgaard 2011; 2014; Goldman 2012; 2013). Each of these has a distinct set of research methodologies, but just as significantly, each is aimed at answering a distinct set of questions. Creativity is the key concept for critical/theoretical and cognitive approaches. In one way or another, these studies are all concerned with how the creative act happens in jazz, whether through considering the mental processes involved directly, or through analysis of the resulting musical artifact. Sociability and mediation are the key concepts for ethnographic and historical studies. Whether focused on change over time or on largely synchronically understood structures, these studies generally offer answers to the question: what are the interpersonal networks in which musical improvisation has grown and thrived, and how have technologies been implicated in the process?

A number of questions without consensus answers come up in the literature. For instance, scholars have not resolved whether pattern use represents creativity or its absence. The crux of this argument stems from readings of Albert Lord's work on oral formulaic composition (Lord 1960) and the underlying assumption that creativity in jazz improvisation means not playing the same thing from performance to performance. Owens initiates this in this much-quoted passage: "[T]he master player will seldom, if ever, repeat a solo verbatim; instead he will continually find new ways to reshape, combine, and phrase his well-practiced ideas. An awareness of these melodic ideas allows the listener to follow a solo with great insight into the creative process taking place" (Owens 1974: 17; see also Treitler 1974 for the incorporation of oral formulaic theory into music studies). A number of subsequent studies follow this out, some (such as Gushee 1991 and Kernfeld 1983) focusing on the patterns themselves, while others (such as Martin 1996 and Smith 1983) argue that the larger-order compositional process in which patterns can be found is more significant. Finkelman (1997) argues that in distinguishing between formula (the specific melodic sequence) and pattern (the ways in which melodic sequences are deployed), authors have failed to see the significance and creativity of what he calls "pattern-forms" and "formula-ideas," or what we might call "licks."

Similarly, there is no consensus on whether improvising musicians are deploying stored material or running "mental algorithms" (see Johnson-Laird 2002; Norgaard 2011; 2014; Norgaard / Spencer / Montiel 2013; Pressing 1998). Finally, there is some division over whether licks are a tool for beginners or also in continued use by master performers. Many writers appear to see licks as a core component even of master musicians' improvisational practice/language. Berliner, however, is considerably more restrained on this issue, suggesting that licks are primarily part of the student musician's repertoire (Berliner 1994: 101). Veteran artists may still use them, but Berliner quotes at least one musician (Stanley Turrentine) who describes them as a "crutch," to be used when the creative process is not working for him.

Computational Methods for Jazz Research – the Dig That Lick Project

In general, existing work on pattern usage in jazz improvisation has relied on relatively small datasets to make their main points. Volume of data, i.e., the numbers of specific performances analyzed, is perhaps not crucial for qualitative studies. A single compelling example of a process of interpersonal musical transfer, e.g., the case of Jaki Byard quoting from a Mingus tune (Monson 1996), speaks first as a uniquely interesting musical event, but also as a kind of ideal

type, suggesting the existence of countless other, similar instances across jazz as a whole. That said, with more quantitative work, as the datasets used in the questions at hand grow larger, the findings will be more convincing. This is also true for quantitative approaches such as our own that aim to be in dialogue with qualitative studies. Certainly, when considering the social nature of jazz improvisation and learning, a larger and more diverse dataset is an important key to the stability of the results.

The databases and analytical tools of the international Dig That Lick project (DTL, 2017–2020)[1] have the potential to facilitate such larger-scale analyses. The project investigated the usage of patterns and licks in monophonic jazz solos using search algorithms on a large database of jazz solo transcriptions. These transcriptions are created automatically using state-of-the-art melody extraction algorithms based on neural networks and advanced signal processing techniques (Başaran et al. 2018; Frieler et al. 2019b). The transcriptions are equipped with extensive metadata based on a specifically designed semantic model (Proutskova et al. 2022). N-grams, i.e., melodic sub-sequences, are extracted from the transcriptions using pitch and interval representations and stored in a database. Similarity algorithms, which are grounded in music psychological research, are used to retrieve pattern instances for a given query and similarity threshold. The system allows tracing patterns and their variants across the whole database while combining them with the available metadata to make further inferences. The web-based pattern similarity search[2] interface allows searching for instances of similar melodic patterns of any length and frequency of occurrence within three jazz databases: the DTL1000 Database with a total number of 1,685 automatically transcribed improvisations (including some shorter segments of 'tradings' between soloists) from one thousand tracks, which were randomly selected from each decade of jazz history (Crayencour et al. 2024); the Weimar Jazz Database,[3] which contains 456 manually transcribed improvisations by 78 soloists (Pfleiderer 2017); and 56 transcriptions of Charlie Parker improvisations from the Parker Omnibook (Baker et al. 2016). Additionally, to allow for comparisons with other music repertoires, the freely available Essen Folk Song collection, which contains over 7,000 European folk melodies (Schaffrath 1995), is provided. Since the automatically generated DTL1000 database does not yet provide for harmonic or metric content, only the melodic aspects of a pattern (sequences of pitches or intervals) are examined, discarding all rhythmic, metric, or harmonic context.

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1   http://dig-that-lick.eecs.qmul.ac.uk/
2   https://dig-that-lick.hfm-weimar.de/similarity_search/
3   https://jazzomat.hfm-weimar.de/dbformat/dboverview.html

To execute a search, the user enters a pattern on a virtual keyboard or as a list of text elements and chooses an interval or MIDI-tone (pitch) representation. Then, the tool provides a list of pattern instances described by metadata, with links to audio snippets for aural inspection. Not only identical pattern instances, but also similar patterns that differ in one or more tones from the query, can be searched for. Similarity is estimated using the Levenshtein distance (edit distance). Various studies (e.g., Frieler / Müllensiefen 2006; Grachten / Arcos 2004; Gulati 2016) have shown that this distance measure is a good approximation to similarity judgements of melodies by human experts. The similarity search operates on a database of the complete set of pitch and interval n-grams of up to 20 elements that were previously extracted from the databases. For the three jazz databases, this amounts to about seven million distinct n-grams with about ten million instances both for MIDI pitch and interval representations. By entering a pattern, similar n-grams can be retrieved from the database. To further control the result set, the search interface provides options for parameters such as "minimum similarity," "maximum length difference" (allowing for similar n-grams of differing length), or the preservation of melodic contour and pitch range. All searches can also be refined using metadata filters for performers, instruments, recording year, style, etc. Search results are presented in tabular form together with two graphical representations allowing for visual inspection – an n-gram network graph and a timeline chart. Results can also be exported. Finally, there is an application programming interface (API) that allows executing similarity searches from within external program scripts.

Case Study 1: A Typical Bebop Lick

The interval pattern [-1, -2, -1, 3, 3, 3, -1, -2] (represented in semitones, see fig. 1) can be considered a typical bebop pattern with a distinctive recognizable structure (Frieler et al. 2019b). In fact, it is the fifth-most frequent non-trivial pattern – that is, a pattern that is not a trill, a tone repetition, or a simple scale – of length 8 or longer across the three jazz databases. It can be found as patterns M20 and M40 in Owens's work on Charlie Parker (Owens 1974). In order to find variants of the pattern, it was submitted as a query to the similarity search system and the DTL1000, WJD, and Omnibook databases. A similarity threshold of 0.7 and a maximum length difference of 2 was used, and overlapping instances[4] were filtered out, as were instances that span across phrase boundaries.

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4   The pattern search engine uses similarity values between 0 and 1, where one means identity. The similarity threshold indicates the minimum similarity an n-gram should have with the search pattern to be included in the result set. As similarity calculation uses the Levenshtein

In other words, only patterns that do not cross a phrase boundary and which differ in no more than two intervals in length and have a similarity of least 0.7 (on a scale of 0 to 1) are included in the result set. Likewise, all instances lacking a three-interval nucleus in the center were discarded. This resulted in a set of 311 instances of 132 different variants of the lick, 105 in the DTL1000 database, 115 in the Omnibook, and 91 in the WJD.
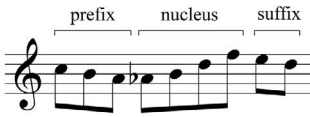

Fig. 1. Interval pattern [-1, -2, -1, 3, 3, 3, -1, -2] in staff notation, starting with C

Looking at a timeline plot (fig. 2) of all instances of the pattern variants found in the WJD and the DTL while disregarding the Parker Omnibook, the number of instances played by Charlie Parker (24 instances) is still striking. Sonny Stitt (17), Dexter Gordon (15), Sonny Rollins (11), Dizzy Gillespie (8), and Stan Getz (8) are also heavy and early users, with Dizzy Gillespie producing four instances in one solo alone ("Be-Bop," 1945). Interestingly, more recent post-bop players such as Michael Brecker (3), Chris Potter (3), and Wynton Marsalis (3) have this pattern in their repertoire, too. However, the pattern variants are not equally popular across the main jazz styles as annotated in the WJD (χ^2 (7) = 127.3, p < 0.001), as it is much more likely to be found in bebop and hard bop solos (about 68%) than in any other styles. This justifies the denomination of the pattern as a typical bebop lick, although the earliest instance can be found with swing tenor sax player Chu Berry (in his solo on "Body and Soul," 1938).

To further analyze the variants of the lick, pattern nuclei were classified by the seventh chord they represent, and prefixes and suffixes of the nuclei were ranked by frequency. This allowed constructing unique tags of the form "nn-X-mm," where "nn" is the frequency rank of the prefix, "mm" is the frequen-

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distance, which allows for sequences of different lengths, the interface also offers the option of specifying an upper bound of length difference between the search pattern and sequences (within the similarity threshold; these two values are coupled). Furthermore, if length differences are allowed and the similarity threshold is lower than one, the result set can contain (strings of) n-grams that will overlap. For example, consider searching for the string ABC in a text corpus with a similarity threshold of 0.75 and a maximum length difference of 0. Then, a ZABD sequence in the corpus contributes the strings ZAB and ABD to the result set, but these two matches have an overlap of two elements (AB). The interface allows for filtering out these overlapping instances using different configurable criteria. The default setting will return only the string ZAB that occurs earlier where both candidates have the same length and the same degree of similarity.
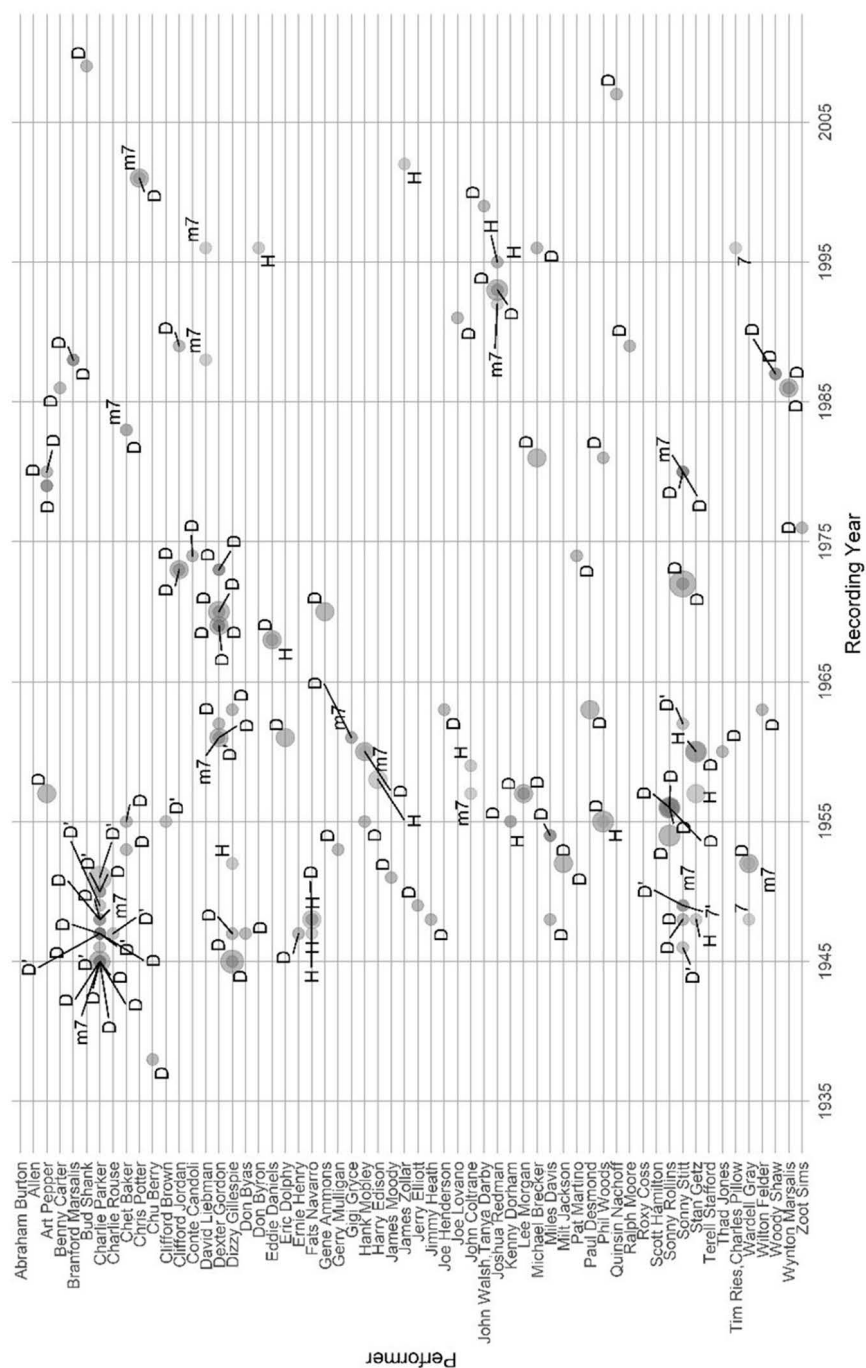
Fig. 2. Timeline of instances of the lick and its variants with performers on the y-axis and recording years on the x-axis. Labels and transparencies indicate nucleus type, while size represents frequency (see text for details).
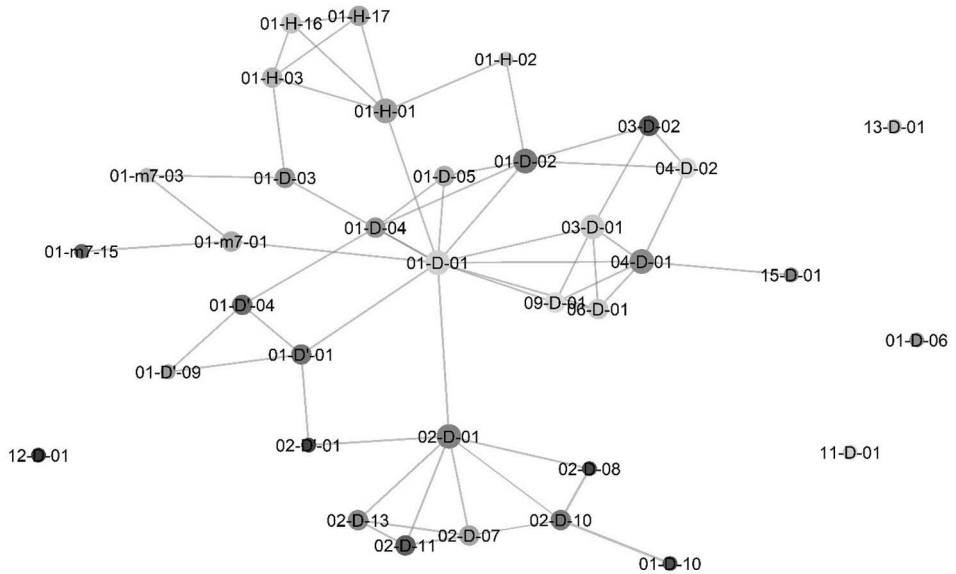
Fig. 3. Similarity network of the most common lick variants with at least two instances. Similarity cutoff was set to 0.8. Transparency and size of the node correspond to the degree of the node (Freeman centrality, number of connections to other nodes). See text for detailed explanation of the labels.

cy rank of the suffix, and "X" is the nucleus code: *D* for a diminished arpeggio [3, 3, 3], *D'* for its first inversion [-9, 3, 3], *H* for a half diminished chord [3, 3, 4], 7 for a dominant seventh chord [4, 3, 3] and *7'* for its first inversion [-8, 3, 3], and finally *m7* for a minor seventh chord [3, 4, 3].

Out of the 4^3 = 64 possible four-tone chords with combinations of ascending minor/major thirds and descending minor/major sixths, only six occurred as nuclei in our result set, with the original *D* [3, 3, 3] being the most common with 248 instances (70%), followed by its first inversion *D'* [-9, 3, 3] with 42 instances (13%). No sixth was found on any other than the first position. Together, this indicates the stability and specificity of the pattern. For the prefixes, 43 different versions were found with the original [-1, -2, -1], the far most common with 174 instances (56%). The suffixes came in 31 variants, and the original [-1, -2] was the most common with 140 instances (45%). A pattern network using an edit-distance-based similarity of all patterns can be found in fig. 3. Here, a similarity cut-off of 0.8 is used, and the node size is proportional to Freeman centrality, the number of connections of a node to other nodes. The original pattern (01-D-01) is in the center, as expected.

For further structural analysis, we extracted chord contexts, metrical positions, absolute pitch values, and chordal diatonic pitch class information (Frieler

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2017) for the first tones of the nuclei. As this information is not available in the DTL1000 database, the following results pertain only to the WJD and Omnibook databases.

This analysis shows a remarkable consistency. 79% of all nuclei start on a beat (WJD: 59%, Omnibook: 95%), while the distribution over the beats in a 4/4 bar differs between the Omnibook and the WJD. In the WJD, the nuclei start on many different beat and offbeat positions but most frequently on the third (22%) and the first (14%) beat of a 4/4 bar, whereas in the Omnibook, the majority start on the second beat (45%), followed by rather equal shares (15–17%) for the other beats in a bar.

The most common interval in relation to the root of the chord context for the first note of the nucleus is the third of the chord (55%), whereas the most common chord context is a C^7 chord (18%), followed by G^7 (9%), D^7 (6%), and F^7 (6%). Generally, a dominant seventh chord was the most common chord context for the nuclei with 64% of all instances, followed by the minor and minor seventh chords with 16% in total (the Omnibook has a tendency to notate minor chords where other sources would use minor seventh chords).

From these most common traits (a D nucleus with the most common prefix and suffix, the original 01-D-01 pattern, where the nucleus starts on the second beat of a 4/4 bar and on the third of a dominant seventh chord), we can construct a prototypical version of the pattern. There are two instances of this prototype in the WJD and three in the Omnibook. The WJD instances are played by Charlie Parker (fig. 4a) and Sonny Rollins (fig. 4b).

Fig. 4a. Prototypical version of the lick (01-D-01), as played by Charlie Parker in his solo on "Ko-Ko" (1947) in m. 51

Fig. 4b. Another prototypical version of the lick by Sonny Rollins in his solo on "Airegin" (1954) in m. 22

To sum up, this example is a typical case of a jazz or bebop lick. It probably originated with one or two players, viz. Charlie Parker and Dizzy Gillespie, and was transmitted throughout the jazz world, remaining in use today. A prototyp-

ical version was reconstructed as the most common variant (01-D-01) with the most common metrical and chordal placement of the nucleus. It is probably not too far-fetched to say that all other variants are adaptations or mutations of this single prototype. Furthermore, this lick shows typical features of (modern) jazz melodic construction in a very concise and compact way, namely, chromaticism and chromatic approaches, four-tone chord arpeggios using the upper structure of (dominant seventh) chords, and a zig-zag type melodic movement with two turning points on different metrical positions giving rise to implicit syncopations. In short, this lick seems to be bebop in a nutshell.

Case Study 2: Minor Third with a Double Chromatic Approach

The lick presented in this second case study is very short and comprises only the four intervals [-2, -3, 1, 1], corresponding to five tones (see fig. 5). The total ambitus is that of a descending minor third. The pattern is probably constructed by elaborating the final chromatic step in the short descending diatonic sequence [-2, -1] with a double chromatic approach from below, i.e., [-1] → [-3, 1, 1]. Chromatic approaches are a well-known technique for jazz solos (cf. Frieler 2019) but less common in other styles of music. In the Essen Folk Song Collection, the pattern [-3, 1, 1] occurs only three times, whereas in the combined DTL1000, WJD, and Omnibook corpus, there are 1,205 instances (contained in a single phrase). The full pattern in question occurs 315 times (contained in a single phrase), which is about three times more frequent than one might expect from the single interval probabilities.[5]

Fig. 5. Interval pattern [-2, -3, 1, 1] in staff notation, starting with C

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5   A sequence of N intervals x_i with probabilities p_i has an *a priori* probability given by the product of single probabilities: $p = p_1 p_2 \ldots p_N$. With M elements in a corpus, one would thus expect to see pM instances. The embellished third lick has an *a priori* probability of 0.0002, and the combined database has 4,165,185 elements, so the expected number of [-2, -3, 1, 1] patterns is .0002 × 4,165,185 = 106.6, whereas the observed frequency is 327. In comparison, the inverted pattern [2, 3, -1, -1] has an expected value of 729 instances in the database, but in fact occurs only 171 times, about a fourth of the expected value.
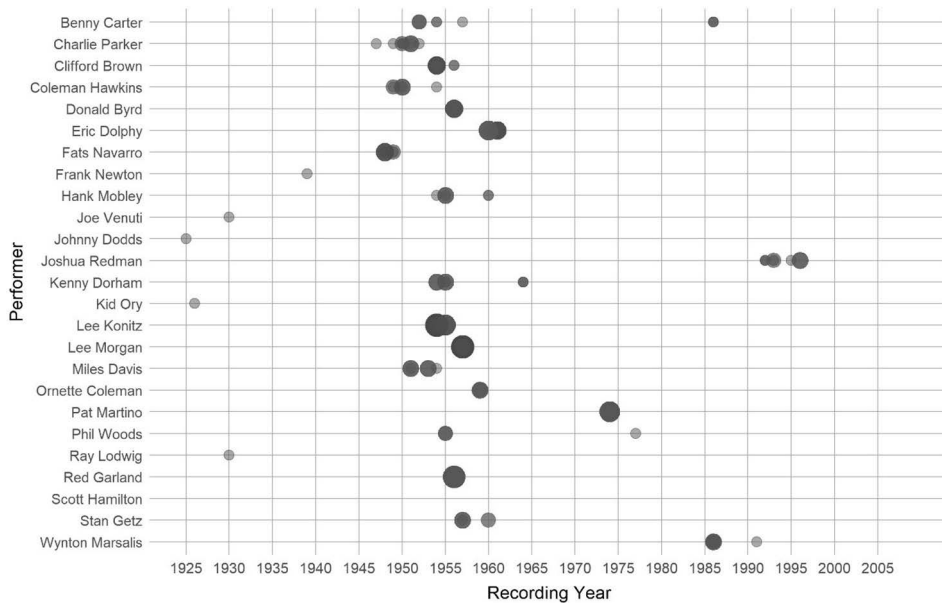
Fig. 6. Timeline of instances of the [-2, -3, 1, 1] lick. Only performers with five or more instances or with occurrences before 1940 are shown for reasons of space. Each dot corresponds to one solo, with dot size proportional to the number of lick instances.

Chromatic approaches are typically associated with bebop-style melodies, but the distribution of instances over recording years (fig. 6) shows that this particular pattern already occurred in traditional jazz and swing, with the earliest instance coming from Johnny Dodds in his clarinet solo on "My Heart" in a 1925 recording by Louis Armstrong's Hot Five. But the lick peaks in the heyday of cool jazz and hard bop, with half of all instances found between 1954 and 1962. It continues to be used in the following decades – Joshua Redman, for example, seems to be particularly fond of it. Tab. 1 shows the usage statistics for performers with at least five instances. At the top of the list is Lee Konitz with 20 instances, nine of which occur in a single solo. Charlie Parker and Fats Navarro, two of the most influential bebop players, also used it quite frequently. This suggests that although the lick was already in use before bebop, it was mainly popularized by bebop musicians.

To investigate the tonal context in which this pattern is commonly played, we used the instances in the Weimar Jazz Database, because chordal information is only available for these. We extracted the chord context for each tone of the pattern and calculated chordal pitch classes, as in case study 1.

The most common tonal uses can be found in tab. 2. In over half of the cases, the pattern is played over a single chord, most often a dominant seventh chord.

For these cases, there are two main forms: either the pattern starts on the fifth of the chord and descends to the third, or it starts on the root and descends to the major sixth (13th). The first also occurs quite frequently over a major seventh chord and the latter over minor seventh chords. In 45% of the remaining cases, the pattern is played over two chords, most frequently V^7-I^7, ii^7-V^7, V^7-I^{maj7}, or V^7-i^7. Here, the pattern most often starts on the root of the first chord and lands on the third of the second chord, that is, the pattern has a certain cadential character.

Finally, it is interesting to see how this short cadential formula is used in the context of longer patterns. To this end, we retrieved all patterns that occur at least ten times in the combined corpus and contain the pattern ("embedding patterns"). This resulted in a set of 44 patterns with 960 instances. In this set, we found six maximal embedding patterns, all of length seven, with 64 instances in total. The most common maximal embedding pattern from our dataset is [-1, -2, -1, **-2**, **-3**, **1**, **1**], first exhibited by Fats Navarro in 1949 and then by Charlie Parker in 1952 (fig. 7), followed by Joe Henderson and Herbie Hancock in the 1960s, but most commonly appearing in the 1990s with players like Joshua Redman (four instances in three solos), Wynton Marsalis (two instances in two solos), and David Liebman (one instance). The other maximal embedding patterns are [1, **-2**, **-3**, **1**, **1**, 3, 3], [-1, **-2**, **-3**, **1**, **1**, 3, 2], [-1, -1, -1, **-2**, **-3**, **1**, **1**], [-1, -2, -2, **-2**, **-3**, **1**, **1**], and [-3, 1, 1, **-2**, **-3**, **1**, **1**]. If one relaxes the condition on minimal frequency to at least two instances, the longest maximal embedding pattern is [**-2**, **-3**, **1**, **1**, 9, -3, 1, 1, -4, -3, -2, -1, 9, -3] (fig. 8), which was played by Fats Navarro in 1948 on "Good Bait (Alternate Take)" and in 1949 on "Lady Be Good." All in all, this gives a glimpse into a common solo construction technique, where longer patterns are assembled from smaller melodic units.

Fig. 7. Most common maximal embedding pattern (with at least 10 instances) for [-2, -3, 1, 1] as found in Charlie Parker's second solo on "Kim" (1952)

Fig. 8. Maximal embedding pattern (with at least 2 instances) for [-2, -3, 1, 1] as found in Fats Navarro's solo on "Good Bait" (Alternate Take) from 1948

Tab. 1. Performer statistics of [-2, -3, 1, 1] instances

Performer	Total number of instances	Max. number in single solo	Number of solos	Total number of solos in corpus
Lee Konitz	20	9	4	12
Lee Morgan	15	9	3	7
Eric Dolphy	15	5	6	7
Clifford Brown	14	4	7	11
Charlie Parker	13	3	10	102
Joshua Redman	11	3	8	54
Kenny Dorham	11	3	7	11
Benny Carter	10	2	8	15
Fats Navarro	10	4	6	11
Miles Davis	8	3	4	29
Coleman Hawkins	8	3	5	20
Red Garland	8	8	1	1
Hank Mobley	7	3	5	9
Scott Hamilton	7	5	3	9
Wynton Marsalis	7	3	4	7
Stan Getz	6	3	3	16
Pat Martino	6	6	1	1
Donald Byrd	5	4	2	2
Phil Woods	5	2	3	22
Ornette Coleman	5	3	2	20

Note: only performers with five or more instances are shown.

Tab. 2. Typical chordal contexts for the [-2, -3, 1, 1] pattern

Chordal diatonic pitches	n	Rel. Freq. (%)	Most frequent chord progression	Example
5 4 2 ♯9 3	37	21	V^7	Miles Davis, "Tune Up" (1953)
1 7 5 ♭6 6	19	11	V^7	Herbie Hancock, "Gingerbread Boy" (1966)

1 7 5 ♭6 →3	17	10	V⁷ → I⁷	 Clifford Brown, "Jordu" (1954)
1 7 5 ♭6 →3	17	10	V⁷ → I^maj7	 Lee Konitz, "All the Things You Are" (1955)
1 7 → 2 ♯9 3	9	5	V⁷→I⁷	 Clifford Brown, "Stompin' at the Savoy" (1954)
3 ♭9 7 ♯7 1	7	4	ii⁷	 Joe Lovano, "Little Willie Leapin" (1994)

Case Study 3: Post-Coltrane Patterns

After Charlie Parker, John Coltrane was among the most influential musicians on his contemporaries and successors; and moreover, as David Ake (2002: 112–145) has unpacked extensively, he remained influential because some of his work became the basis of formal, academic jazz improvisation pedagogy. Examining Coltrane's improvisations in a social context is difficult, but the Dig That Lick apparatus enables this on a much larger scale than previously possible.

In his book on John Coltrane, Lewis Porter (Porter 1998) debates Coltrane's influence in the post-Coltrane era. In the epilogue, Porter discusses Coltrane's son Ravi and his attempt to find his own voice while playing with musicians who had performed alongside his father (Porter 1998: 295):

> Ravi studied John's legacy just as musicians all over the world do; not because it is his father, but because there's no way to be a jazz musician since Coltrane without knowing his music. The challenge is to learn from Coltrane without imitating him. [...] Among the many who developed a distinctive voice out of the Coltrane legacy are Charles Lloyd, Ralph Moore, David Liebman, Joe Farrell, Steve Grossman, Pat LaBarbera, Michael Brecker [...], Bob Berg, Jan Garbarek, and numerous other players of tenor and soprano saxophone. But his influence extends far beyond saxophonists – he affected the whole field of jazz

improvisation, influenced the ensemble sound of jazz groups, and set forth an attitude about what jazz is and what it can be.

He later goes on to list other post-Coltrane musicians who have used his concepts and techniques to create their own styles of improvisation. These musicians include Chick Corea, Woody Shaw, Greg Osby, and Steve Coleman (ibid.).

However, Porter does not give examples to show how Coltrane influenced these musicians. His analytical examples of other musicians' works pertain only to those who influenced Coltrane in his younger years, and they really only include Charlie Parker and a handful of classical composers that Coltrane would have encountered in music lessons growing up. His discussion of Coltrane's influence on musicians in the post-Coltrane world is primarily ethnographic. With our dataset, combining the DTL1000, Parker Omnibook, and WJD datasets, we can expand the process of mapping the musical influence of artists across genre, space, and time.

In general, the simpler and shorter the pattern, and the more the pattern fits within diatonic frameworks, the more results we can find with the similarity search tool. It shows that certain simple patterns are common in jazz (whether or not they also appear in Western music in general). Conversely, longer and more complicated patterns yield fewer, if any results. However, one long pattern resulted in 181 matches with similar patterns and 39 exact matches with other solos (see fig. 9). The lick's structure is a rising nine-note Dorian pattern in scalar form that does not change contour. What makes this lick particularly interesting is that it is quite simple – a scale pattern – and yet it is considerably 'lick-ish.' The capacity of such a simple lick to point back to a specific artist – even one as distinctive and widely-known as Coltrane – is also interesting. Our analysis of the dataset suggests that this lick does, in fact, map onto a framework of Coltrane-influenced musicians and even Coltrane references.

When we list the search results for this lick chronologically, Coltrane's iterations of the lick are clearly not the first. However, the few instances that predate it – a Cootie Williams solo on a 1941 Duke Ellington Orchestra recording of "Clementine," three solos by Miles Davis, and one instance in a Charlie Parker recording of "An Oscar for Treadwell" – all sound different from Coltrane's use. Here, rhythm and placement within the solos are crucial differences. Williams's solo, for instance, uses this pattern not as a lick, but as part of a longer passage moving between two more motivic sections. Davis's use of the same note sequence in "Constellation," in the 1948 recording with Charlie Parker, gives it a rhythmic treatment that focuses on the first note (by extending it), producing quite a different effect from Coltrane's later use. Coltrane himself first used a similar lick in his solo on "Nutty," which was recorded in mid-1957 but not
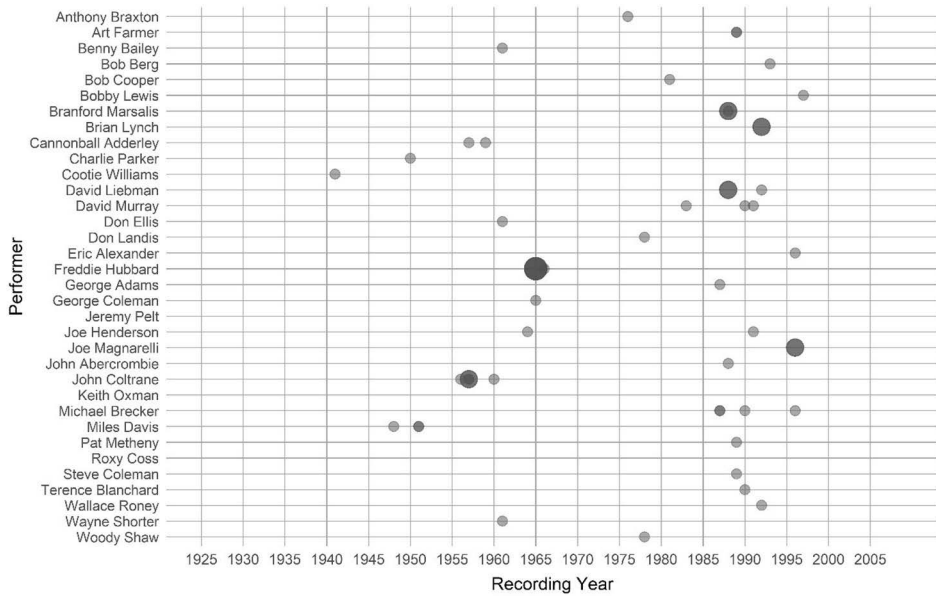
Fig. 9. Timeline for all instances of the extended Dorian scale [2, 1, 2, 2, 2, 1, 2, 2] in the combined corpus. Each dot represents a solo, with dot size proportional to the number of instances.

released until 1961 on the album *Thelonious Monk with John Coltrane*. It was followed just a few months later by "Blue Train" from Coltrane's album of the same name. Subsequently, it was played by as many as 33 musicians over the next 40 years of solos found in the database, with performers including Cannonball Adderley, Don Ellis, Wayne Shorter, Joe Henderson, Freddie Hubbard, George Coleman, *Woody Shaw*, David Murray, *Michael Brecker*, Branford Marsalis, *David Liebman*, John Abercrombie, Pat Metheny, *Steve Coleman*, David Newman, Anthony Braxton, Bob Mintzer, and *Bob Berg* – some of whom are mentioned in Porter's list of players directly influenced by Trane's improvisational theories and formulas (artists included in Porter are in italics). Since not all of these play the pattern in same manner as Coltrane (for instance, some play it slower, with a distinctly motivic rhythmic profile, as part of a very long glissando, etc.), the total number of hits can actually be whittled down to about 20 nearly exact matches. In addition, there are five more results that closely resemble the pattern (though they extend further than the pattern in question).[6] In sum, even from

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6   The 20 nearly exact matches, along with those played by Coltrane himself, include the following: Anthony Braxton, "Giant Steps"; Art Farmer, "Blue Wail"; Bob Berg, "Angles"; Bob Cooper, "Little Pony"; Dave Liebman, "Day and Night"; David Murray, "Chelsea Bridge"; David Newman, "Son of Ice Bag"; Don Landis, "Stella by Starlight"; Eric Alexander, "Some Other Spring"; Freddie Hubbard, "Dolphin Dance" and "Maiden Voyage"; Joe Henderson,

a somewhat limited dataset, we can chart a significant number of performers using the pattern as part of a larger sequence that may sound like a 'Trane lick' to the listener.

Notably, while this pattern does generate a small number of hits before 1957, its presence increases disproportionately afterward. Note that much of the material in the combined datasets comes from pre-1957 recordings (over a third in the WJD, about half in the DTL set, and, of course, everything in the Omnibook, since Charlie Parker passed away in 1955). Reducing the lick by one or more notes off the end produces significantly more results, with a seven-note version returning as many as 206 iterations going back to the early 1940s. Many of these are clearly unrelated, but nonetheless it is fair to say that Dorian and other modal scalar licks are in use early on, but lengthier uses of the scale – more than one octave – are introduced around the time that Coltrane became a bandleader in his own right. Unsurprisingly, this is also supported by Porter (1998: 216):

> Coltrane's style was always changing. He moved more and more into developing a self-reliant sound world, a world that by the 1960s had less and less in common with the music that he started with – the music of Lester Young and Charlie Parker. [...] What's more, he developed a vocabulary of licks that are in many cases not traceable to his predecessors. One way that Coltrane developed this unique sound world is by bringing into his music – and through his influence, into all of jazz and beyond – an eclectic collection of method books, exercises and scales from around the world.

Jimmy Heath, a contemporary of Coltrane in Philadelphia, confirms in an interview with Porter that the two of them were very interested in learning the various modes and modal scales, and that they created their own exercises for these concepts in all twelve keys. These two statements confirm two observations from our study: one, that Coltrane was prone to using interesting scales in his works, and two, that it shouldn't be surprising that this concept doesn't appear in a fairly large dataset of improvisational solos by major performers before 1957.

Of course, the jazz canon consists not just of players, but also of the specific recordings that have been deemed influential or important. One might expect the more canonical recordings to be those that feature patterns found in other players' improvisations. *Giant Steps*, *Impressions*, *Ascension*, *My Favorite Things*,

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"In 'n' Out" and "Johnny Come Lately"; Joe Magnarelli, "Big Sky"; Keith Oxman, "Deep in a Dream"; Kenny Garrett, "Gendai"; Michael Brecker, "Maiden Voyage" and "Peep"; Steve Coleman, "The Oracle"; and Woody Shaw, "Stepping Stone."

Love Supreme, and so forth would seem to be recordings that have generated significant response. While both "Blue Train" and "Nutty" are well known pieces, they have not warranted extended discussion by jazz historians or critics, which makes it surprising to see this apparently influential lick coming from those recordings. Porter's biography, for example, mentions "Blue Train" only briefly and provides no musical examples from the entire *Blue Train* album; instead, the recordings that receive the most attention from Porter are the abovementioned 'canonical' works. To test for the relative impact of this lick vs. those in more canonical recordings, we applied the same type of investigation to several recurring patterns from Coltrane's solo in "Giant Steps" – a recording from the same time period that has had traction in both musicological jazz scholarship (again, see Porter 1998) and pedagogical/analytical material (Ake 2002). For "Giant Steps," we found two extremes: on the one hand, results that don't clearly point to Coltrane's influence because they have hundreds of hits that span the entire timeframe of the database, going as far back as the 1920s; on the other hand, results that show Coltrane as the only musician performing the pattern in question. This confirms a reasonable hypothesis that the interesting thing about "Giant Steps" is not the circulation of patterns used to get through the harmonic structure, but rather the harmonic structure itself. This is what ultimately makes the "Blue Train" Dorian lick an interesting find – it produces results that show a pattern that originated with Coltrane and spread widely. Moreover, it shows an appreciation (whether it was consciously adopted or not) for Coltrane's more soulful work.

Conclusion and Outlook

In the first case study, we traced a typical bebop lick and its variants. The lick seems to have been popularized by Charlie Parker and Dizzy Gillespie, though they themselves might have taken inspiration from earlier swing players. Many other players from the bebop era who were influenced by Parker and Gillespie (Berliner 1994; DeVeaux 1991) also used the pattern quite frequently, which indicates a direct transmission. It has since become a stock phrase of jazz improvisation. Modern post-bop players also use it quite often. This is indicative of their mastery of the bebop tradition, though it might also be a direct and deliberate reference to their bebop forebears (e.g., Michael Brecker using it over "Confirmation," a well-known composition by Charlie Parker). The many pattern variants nearly always appear in similar metrical configurations and harmonic contexts. This indicates that metrical and harmonic aspects might be stored

along with the pattern in a player's memory. However, a pattern can be adapted to different harmonic contexts without losing its musical shape, which opens further questions about pattern construction and memorization.

In the second case study, we looked at a rather short but significant cadential formula, which appears to be an embellished descending minor third using a double chromatic approach. It can be found throughout jazz history and also appears in typical harmonic contexts, mostly over dominant-seventh chords starting from the fifth or the root of the chord. Furthermore, we found that this formula is used to build longer licks that are played frequently. This case study thus gives some interesting insights into melodic construction principles of jazz solo improvisation.

The third case study shows a substantial trajectory of material transmitted from Coltrane to later players. Looking at "Blue Train" and exploring a modal lick in a social manner confirms the notion that jazz is a social artform. However, there are limitations to the results that ultimately stem from the size of our dataset. We believe that a larger dataset would allow for an even more critical exploration of patterns and licks, which might enable us to make claims about the influence of previously unexplored or overlooked material in jazz scholarship. Because the selection of solos currently available in the similarity search tool is extremely canonical (WJD) and representative (DTL1000), respectively, we can say with confidence that it is at least representative of the existing history of jazz. As we incorporate more examples, we may be able to make larger and more specific claims.

In sum, we believe that expanding the dataset will allow scholars going forward to become even more critical than we are at present. The apparatus will likely contribute to the exploration of influential works and performers and reveal closer links between artists who have interacted with and inspired each other. Even better, by adding discographic information and social mapping applications, we should be able to see detailed networks of how performers exchange material both in performance and through recordings. Adding more examples will hopefully result in a more robust, comprehensive, and detailed account of the travels of licks, riffs, and other musical patterns than is possible with conventional methods. Moreover, our approach offers a critical reflection on the role of new digital humanities methodologies in jazz studies.

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Scott Currie is associate professor of ethnomusicology at the University of Minnesota, specializing in jazz, rock, and world music. His ethnographic and historical research to date on improvisation in cross-cultural perspective has focused on avant-garde jazz practices in New York City, Berlin, and Minneapolis, as well as rocksteady and roots drumming traditions in Kingston. In addition, he has founded the UMN Institute for Reggae Studies, served as associate director of the Vision Festival, and founded the Sound Vision Orchestra. He has performed on saxophones with artists including Cecil Taylor, Bill Dixon, Alan Silva, Marty Ehrlich, William Parker, and the Mystic Revelation of Rastafari.

Lawrence Davies is a lecturer in music on a fixed-term contract at the University of Liverpool. His research focuses on African American blues and jazz in international and transnational contexts and musical histories of the climate crisis. He has contributed to *Jazz Research Journal* (2020), *The Global South* (2021), and the *Journal of Jazz Studies* (2023) and has publications forthcoming in *Songwriting Studies Journal*, *Music & Letters*, and *The Oxford History of Jazz in Europe*. Before arriving at Liverpool, he was a Leverhulme Early Career Research Fellow at Newcastle University.

Simon Dixon is professor of computer science, director of the UKRI Centre for Doctoral Training in Artificial Intelligence and Music, and deputy director of the Centre for Digital Music at Queen Mary University of London. His research focus is music informatics, especially the use of artificial intelligence and digital signal processing for the analysis and computational modelling of musical knowledge and performance.

Kira Dralle is currently a visiting assistant professor of jazz studies at the University of Pittsburgh. She completed her PhD in cultural musicology at the University of California Santa Cruz in 2022, where she received the UC President's dissertation fellowship for outstanding contributions to racial diversity in academia. At the intersection of historical ethnomusicology, visual and material culture, and philosophy, her research examines archival silence surrounding Black jazz musicians in the Third Reich and Vichy France, as well as the continued effects on transatlantic jazz historiography, canonization, and the racial imaginary.

Laura Emmery is associate professor of music theory at Emory University. Her research focuses on 20th/21st-century music and post-tonal theory, with an interdisciplinary approach that draws on philosophy, literary criticism, critical theory, and performance studies. Emmery's monograph, *Compositional Process in Elliott Carter's String Quartets: A Study in Sketches*, and a critical edition, *Elliott Carter Speaks: Unpublished Lectures*, are a culmination of her archival research at the Paul Sacher Stiftung for over a decade. Her articles have been published in *Twentieth-Century Music*, *Contemporary Music Review*, *The Musical Quarterly*, and *Music Theory Online*, among others.

Klaus Frieler is postdoctoral researcher with the Dig That Lick project at the University of Music Franz Liszt Weimar and is working now as a methods specialist at the Max Planck Institute for Empirical Aesthetics, Frankfurt/Main. He holds a PhD in systematic musicology from the University of Hamburg. His main research interests are computational musicology and music psychology

with a special focus on creativity, particularly jazz improvisation and melody perception.

Magdalena Fuernkranz is a postdoctoral fellow in the Department of Popular Music at the University of Music and Performing Arts Vienna. As co-leader of the project "Performing Diversity" and leader of the project "Female Jazz Musicians in Austria," her recent research has focused on performativity, gender, and intersectionality in pop and rock music, popular music historiography, Austrian music scenes, and gender/identity in jazz. She is co-editor of *Performing Sexual Identities: Nationalities on the Eurovision Stage* (2017), author of *Elizabeth I in Film und Fernsehen* (2019), and co-author of *Aufführungsrituale der Musik* (2021).

Þorbjörg Daphne Hall is professor of musicology at the Iceland University of the Arts in Reykjavík. Her research has focused on Icelandic music through the lens of national identity and place. She co-edited *Sounds Icelandic* (2017) and has published and presented papers internationally on both popular music and jazz in Iceland. Currently, she is researching socially engaged and participatory music projects and the music scene in Reykjavík.

Lucas Henry is an ethnomusicologist (PhD, University of Illinois, Urbana-Champaign) with specialty in jazz, popular music, and cultural policy, particularly in the Nordic region. He is also a graduate of the Jazz History and Research program at Rutgers-Newark and a 2015 recipient of the Berger-Carter research award from the Institute of Jazz Studies. He has taught courses on jazz and world music at Temple University, European Union institutions and governance at the University of Illinois, and contemporary Scandinavia at Augustana College. Lucas currently resides in New Zealand, and is working on a book project about the Iceland Airwaves music festival in Reykjavík.

Harri Heinilä graduated with a doctor of social sciences in political history from the University of Helsinki in 2016. In his doctoral dissertation, Heinilä examined how Harlem's jazz dancers were perceived mainly in the US mainstream press between 1921 and 1943. Over the years, he has specialized in jazz dance in its Harlem context, and especially its main dance, the Lindy Hop. He has been interested also in Hip Hop dances. Heinilä has written numerous articles on the subject. He has been working on a postdoctoral project about Harlem's jazz dance between 1944 and 1959. His ORCID is 0000-0002-7783-9010.

Frank Höger studied systematic musicology and computer science at the University of Hamburg. After graduating in 2010, he developed web applications

for the private sector. He found his way back into academics in 2017 as a Research Fellow in the project "Melodic Patterns in Jazz Performances" at the University of Music Franz Liszt Weimar.

Bernd Hoffmann has worked for ARD radio and other German-language broadcasters in Europe since 1978. From 2002 to 2018, he was head of the jazz editorial department of *Westdeutscher Rundfunk* at WDR 3. He also teaches at various universities and technical colleges. He received his doctorate with the dissertation "Der Reflex afro-amerikanischer Musik in deutschsprachigen Musik- und Rundfunkzeitschriften" (The Reflex of Afro-American Music in German-Language Music and Radio Magazines) and habilitated in the field of popular music/jazz at the University of Music and Performing Arts Graz (KUG) in 2003. He is the founder of the international working group Radio Jazz Research.

Ásbjörg Jónsdóttir is a composer, teacher, and researcher. She received her MA in composition from the IUA in 2018. In addition to her composition career, she conducts a children's choir, teaches piano and takes on various musical projects. She was the artistic and executive director of Skálholt Summer Concerts from 2020–2022. Her music has been performed at the Dark Music Days Festival in Iceland, at Skálholt Summer Concerts, and at Óperudagar. In 2013 and 2018, Jónsdóttir undertook a research project on the music of Þorkell Sigurbjörnsson and jazz in Iceland, funded by the Icelandic Student Innovation Fund. Jónsdóttir released a book with 12 of her own songs for children's choir in 2019.

Francesco Martinelli currently teaches history of jazz and popular music at the Siena Jazz University and at the Conservatories of Livorno and Turin in Italy. He promoted events in his hometown of Pisa, worked as a critic for the Italian magazine *Musica Jazz*, and translated a dozen jazz books into Italian. He curated the exhibition *Siena Jazz Eye* (with vinyl cover art and 500 examples from the Siena Jazz Archive, catalogue published by Mazzotta, 2005) and contributed an article on Basquiat and jazz to the exhibition *Boom for Real* (London; catalogue published by Prestel, 2017). He edited *The History of European Jazz* (Equinox, 2018) and currently writes for *Songlines* (UK) and *The New York City Jazz Record* (USA).

Martin Pfleiderer has been professor for the history of jazz and popular music at the University of Music Franz Liszt Weimar since 2009. He studied musicology, philosophy, and sociology at Giessen University (1988–1993) and was assistant professor for systematic musicology at Hamburg University (1999–2005).

His research is dedicated to rhythm, singing, and improvisation in jazz and popular music, sociology of music, aesthetics, and computational musicology.

Nicolas Pillai is assistant professor in creative and critical practice at the Creative Futures Academy, University College Dublin. He is currently co-editing *Rethinking Miles Davis* for Oxford University Press.

Emiliano Sampaio is a guitarist, trombonist, conductor, arranger, and composer. In 2012, he moved from Brazil to Austria, and in 2021, he finished his doctoral artistic research project with honors (KUG). He has worked with the Metropole Orkest, HR Big Band, JazzKombinat, Lungau Big Band, WAYJO, and Croatian Radio Band, among others. Emiliano has won many prizes for his work, including the 1st prize at the Karel Krautgartner Composition Contest (Prague), several DownBeat Student Awards ("Best Small Jazz Combo," "Jazz Soloist," "Outstanding Original Composition," "Outstanding Arrangement for Large Jazz Ensemble"), and the 3rd prize in the Jazz Comp Graz Composition Contest.

Alan Stanbridge is an associate professor in music and culture at the University of Toronto, and also teaches in the master of museum studies program. He has published numerous journal articles and book chapters in the fields of popular music, jazz history, and cultural policy, and he is the author of *Rhythm Changes: Jazz, Culture, Discourse*, which was published by Routledge in 2023. Stanbridge previously worked in arts management and music promotion in Great Britain, during which time he held a number of senior posts, including director of the Glasgow International Jazz Festival.

DIE INTERNATIONALE GESELLSCHAFT FÜR JAZZFORSCHUNG

Die Internationale Gesellschaft für Jazzforschung / International Society for Jazz Research (ISJ) wurde 1969 ins Leben gerufen und ist am Institut für Jazzforschung der Universität für Musik und darstellende Kunst Graz ansässig. Gemeinsam mit dem 1971 gegründeten Institut gehört die Gesellschaft zu den ältesten aktiven Institutionen weltweit, die sich der Erforschung des Jazz widmen.

Unser Ziel ist die Entwicklung und Erschließung einer systematischen Jazzforschung, die viele Disziplinen umfasst. Unsere Gesellschaft als ein Knotenpunkt internationaler Netzwerke sammelt und stellt die dafür benötigten Fördermittel und bietet eine langjährige Forschungsinfrastruktur.

Seit nun 55 Jahren sind unsere Kernaufgaben zum einen die Organisation internationaler Konferenzen: die mittlerweile 14. Internationale Jazzforschungskonferenz wurde gemeinsam mit der 8. Rhythm Changes Konferenz zum Thema "Jazz Encounters" im April 2024 in Graz veranstaltet. Zum anderen geben wir weltweit renommierte Publikationsreihen heraus: Seit 1969 erscheinen die Publikationsreihen *Jazzforschung / Jazz Research* und *Beiträge zur Jazzforschung / Studies in Jazz Research*; die *Jazz Research News* (aktuell 60 Ausgaben) werden seit 2000 veröffentlicht.

Wir würden uns über Ihre Unterstützung im Rahmen einer Mitgliedschaft sehr freuen!

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THE INTERNATIONAL SOCIETY FOR JAZZ RESEARCH

The International Society for Jazz Research (ISJ) was founded in 1969. It is based at the Institute for Jazz Research at the University of Music and Performing Arts in Graz (founded 1971); the Institute and the ISJ are two of the oldest institutions in the world dedicated to scholarly research and debate on jazz.

Our continuing aim is the development and enhancement of systematic jazz research that involves and connects to a wide range of disciplines. To this end, we raise and provide funding and offer a long-term research infrastructure.

Over the last fifty years, our core activities have been the organization of international conferences; most recently, the 14th International Jazz Research

Conference on the theme "Jazz Encounters" was held in conjunction with the 8th Rhythm Changes Conference in Graz 2024. Our other central task is the publication (since 1969) of the well-known series *Jazzforschung / Jazz Research* and *Beiträge zur Jazzforschung / Studies in Jazz Research*. *Jazz Research News*, now in its 60th issue, was added to our portfolio in 2000.

We would greatly appreciate it if you would support us by becoming a member!

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FÜR JAZZFORSCHUNG

Folgende Bände sind in der Reihe *Jazzforschung / Jazz Research* bisher erschienen / The following volumes have been published in the series *Jazzforschung / Jazz Research*:

der Musik von Oregon; The Music of Horace Silver; Jazz and the Minstrel Tradition: The Young Family Band; Politics of Black Music and Poetry: Amiri Baraka and John Coltrane; Zur Entstehung und Geschichte des Ragtime

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Jazz is a music of journeys, migration, and global mobility – from the legacies of the transatlantic slave trade to global travels for escape, exchange, or putting down roots. Having migrated via changing modes of transportation and media communication, the sounds, musicians, and theories of jazz have led to today's diasporic jazz world of global and local encounters. This book features articles that deal with jazz in various geographic areas such as Japan or Israel, orchestras travelling to Egypt or invited to the USA, and so-called expatriate jazz musicians taking up residence in Europe. By sharing their research about jazz on TV, on records, and at festivals, the authors from different disciplines demonstrate how jazz studies today engage with movement in the music's past to question and shape its future.

This collection of writings has its origins in the VI Rhythm Changes Conference "Jazz Journeys," which took place in Graz (Austria) and where the International Society for Jazz Research celebrated its 50th anniversary.

Christa Bruckner-Haring is a musicologist specializing in jazz and popular music research and deputy director of the Institute for Jazz Research at the University of Music and Performing Arts Graz. Her research focuses on historical and sociocultural issues as well as musical transcription and analysis of jazz and popular music.

André Doehring, musicologist and sociologist, is professor for jazz and popular music research at the University of Music and Performing Arts Graz and director of the Institute for Jazz Research. His research and publications focus on socio-historical, cultural, political, and media aspects of jazz and popular music as well as musical analysis.

Together, they co-edit the publication series *Jazzforschung / Jazz Research* and *Beiträge zur Jazzforschung / Studies in Jazz Research.*

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