The Structure of Improvised Jazz

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"No sane person believes that there is something called 'the structure of improvisational jazz'." (Fiengo ms. 2002)

Ahem… Let's try another:

No sane person believes there is something called 'the structure of improvisational language'.

Few linguists would let this latter assertion pass without objection: language is highly structured, they would say, phonologically, morphologically and syntactically at the very least – improvisation has nothing to do with it. The fact that an utterance can be phonologically, morphologically or syntactically deviant only underscores the fact that there is structure in linguistic objects. The musician in me can do no less for the former.

To start, let's step back, and consider whether there is such thing as 'THE structure of a sentence of human language'. Well, no, but only on the most superficial level: the phrase is meaningless outside of the context of a specific language (composed of a lexicon and a grammar). This language will then comprise an (arguably) infinite set of sentences, with some questionable cases around the periphery. OK, so sentences of human language have structure by virtue of a generative grammar – maybe, since jazz is not defined by a generative grammar, we can deny its structure thus (*pace* Lerdahl and Jackendoff 1983, *A Generative Theory of Tonal Music* – jazz is tonal). Let's try again:

No sane person believes there is something called 'the structure of tall buildings'.

The structure of tall buildings is not defined by a generative grammar… but, no sane person believes that they *don't* have structure. Clearly there is more than one way to have structure. Back to jazz.

At the most basic level, jazz has a **metrical** structure – a regular beat, in groups of some predetermined number (this number can change from time to time, but not spontaneously, or all hell will break loose). Without metrical structure, jazz could have neither a tempo (defined by how fast the beat is, *not* how fast the notes are), nor a rhythm (defined by how the notes line up with the beats). It is interesting to note that, in music, even silence has metrical structure; if this were not the case, there would be no way to define *offbeat*, the lack of which would make jazz impossible. More generally: almost all music has metrical structure. But some, such as *recitativo* (speech rhythm) has very little; chant (Gregorian and Tibetan) has almost none.

Also at a very basic level, jazz has a **tonal** structure – every pitch is perceived by reference to a tonal "home" (*tonic*), and a mode (a set of intervals between the tonic and the other pitches). Most western music (including jazz) recognizes only twelve (chromatic, equally tempered) tones, repeated every octave – so named for the eight of the twelve possible tones that constitute a mode. Very roughly, any of the twelve tones not in the predetermined set of eight is dissonant or blue, and any other pitch is simply "out of tune" – to be used only in sliding from one tone to another, or in vibrato (for which many electric guitars conveniently include a metal lever). Over the course of a song, the tonal center, or even the mode, may change (*modulation*), but in no case will any tone other than the original twelve tones be legitimate (otherwise one is "going flat/sharp"). Many believe that the division of the octave (the interval between pitches of x Hz and $2x$ Hz) in the manner just described is a natural phenomenon – it is not; equal temperament is

a compromise that favors the priorities of western music. Some cultures have music based on a five-note (*pentatonic*) scale, and some use more than twelve – some music for percussion alone has no tonal structure.

Metrical and tonal structure constitute a grid (time x pitch) on which music can be (and is!) plotted. Most music has both of these basic types of structure, but some has only the one or the other (see above). In the 1960s, some composers wrote so-called "experimental" music, which had neither; but it is not clear whether these works merit the label "music", or should be relegated to some other category (e.g. "performance art"). Earlier in the twentieth century, many western composers abandoned the idea of a tonal center, without abandoning the traditional twelve tones, convinced that there was nothing left to say in the tonal idiom (a contention thoroughly invalidated by the existence of jazz). In any case, jazz, whether improvised or not, is not a borderline case: it has both a strong tonal center and a strong metrical structure.

At any point along the metrical (time) axis, jazz has a **harmonic** structure; more specifically, most jazz – especially improvised jazz – has a *homophonic* structure (well-defined bass and melodic lines, and harmony fleshed out in between), rather than a *polyphonic* structure (two or more semi-autonomous melodic lines that play simultaneously). All tonal harmony is essentially an elaboration on the invention/ discovery of Jean-Philippe Rameau (1722, *Traité de l'harmonie*) that consonant harmonies are composed of triads, for example of 4*x* Hz (bass), 5*x* Hz (major third) and 6*x* Hz (fifth), with the possible addition of the minor seventh (7*x* Hz – actually, somewhat higher due to the vagaries of equal temperament). These four tones based on the fifth degree of the major mode (3*x*/2 Hz) comprise the all-important dominant seventh (V7) chord – the fifth, seventh, second, and fourth degrees of the scale.

As members of the western "music community", we perceive certain harmonic and tonal stresses in collections of pitches. In the V7 chord, the dissonance between the bass and the seventh engender a harmonic stress that is preferentially resolved by moving the seventh down (i.e. from the fourth to the third degree of the scale), and by holding the bass (fifth degree of the scale) steady. The third of the V7 is the seventh degree of the major mode, dubbed "leading tone" for the strong tonal stress, which makes us to want it to resolve up to the tonic (tonal center). A similar (but weaker) tonal stress on the fifth of the V7 makes us want it to resolve down – also to the tonic. The result of all of these stresses (*voice leading*) is a major triad based on the tonic. None of these voice leading facts are remotely related to whether music is improvised or composed; they are, however, purely structural.

The paragraph above describes a fact about tonal music that [has] been relatively constant for more than three hundred years. Jazz is different in a number of respects. For one, jazz makes little use of triads; most chords include at least a seventh, and many include a ninth or higher dissonance. But, the basic properties of tonal and harmonic stresses are similar. For another, jazz will often close *without* resolving some dissonance, implying a resolution without providing it. It is a striking effect, but of little theoretical significance. Indeed, the fact that it is possible to so strongly imply a musical resolution only underscores the power of harmonic structure.

The preceding description of harmonic structure, relies solely on local harmonic structure – that is, the harmony is evaluated in relation to its own bass and the local tonality; more globally, every harmony is situated in a **chord progression**. Very roughly, this chord progression can be in the original key of the song, or in some other key (the result of modulation). Improvisational jazz generally has a *predetermined* chord progression and possibly a predetermined bass line as well; this is, in fact, essentially the same system of improvisation common in Baroque music (*figured bass*).

In addition to a predetermined chord progression, improvisational jazz comes with a variety of **melodic** and **rhythmic** baggage, from the composed opening section. A melody is defined solely by virtue of its structure; likewise for rhythm. By describing the structure of a melody or rhythm, one has said everything that there is to say about it. In improvising, a jazz musician may choose to use more or less of this background material, but is not free to play just anything – twelve bars of Stravinsky's *Rite of Spring* will not do, nor will twelve bars of a Bach fugue (even in the unlikely case that it does have the right chord progression). Improvisations are free to be extremely varied or creative, but they are not unconstrained.

Between the global structure of a performance (metrical, modal), and the local structures (harmony, melody, rhythm), there are mid-scale structures that are highly variable and allow for infinite (if constrained) creativity. Very roughly, if the local structures are wrong, it is not jazz, and if the global structures are absent, it is not music. As in the so-called periphery of syntax, the borders of what is and is not "grammatical" are murky and ill defined; but if an improvisation can be "predictable", then we must conclude that something was expected – and in music, only *structures* can be expected. Of course, if a player picks up a tuba, we do not expect it to sound like a saxophone, and if he lacks the requisite "skill", then we may expect him to mess up. However, skill/ technique/ chops have no more place in a theory of jazz, than does a description of the timbre of a tuba – any more than "the mistakes made by a native speaker of Korean" has in a grammar of English.

To be creative in jazz is to be unpredictable in an appropriate way (while still playing jazz) – a theory of creativity in jazz has no greater standing than a theory of rhetoric has in syntax. The theory should tell us why it is jazz (a syntactic question), and why it is appropriate in a specific context (a pragmatic question). The theory may explain why it is unexpected (by reference to a range of what might have been expected), but there is no expectation that a theory of jazz could explain why a solo is effective (an artistic question). A jazz solo can be "too long" for at least two reasons: the audience gets bored, or the soloist fails to stop at the end of the time allotted him. The latter, but not the former, is a structural failure; it has the status of, say, a crossover violation in syntax – probably interpretable, but wrong. To "pop in at the wrong moment, or fail to be there when needed" are both structural mistakes, and have the same status in improvised jazz, as in the *Archduke* trio of Beethoven; bluntly, improvisation has nothing to do with it.

Large scale forms – i.e. everything that happens between, "let's jam" and "damn, that sucked" – are probably the least interesting question a theory of jazz can address; they tend to be extremely formulaic, and are about as meaningful as a style sheet is to the quality of an academic paper. The following is a short list of linguistically inspired analyses of music written by authors who were probably sane at the time; with the exception, that is, of Leonard Bernstein, who may not have been – but his is the most fun to read.

Bernstein, L. (1976). *The Unanswered Question*. Cambridge, Mass: Harvard University Press.

Lerdahl, F., and R. Jackendoff (1983). *A Generative Theory of Tonal Music*. Cambridge, Mass: MIT Press.

Sloboda, J. A. (1985). *The Musical Mind: The Cognitive Psychology of Music*. Oxford: Clarendon Press.

Swain J. P. (1997). *Musical Languages*. New York: W. W. Norton & Company.