A Corpus Analysis of Rock Harmony

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What are the principles of rock harmony?

- Chord succession guided by general principles in other harmonic musical styles
  – e.g. Common-practice-era music

- Theories of rock harmony offer different views
  – Everett 2004: rock as common-practice
  – Stephenson 2002: rock as opposite common-practice
  – Moore 2001: rock as modal

How to study rock harmony?

- Statistical approach

- Relevance to music cognition

- Rolling Stone magazine corpus
  - "500 Greatest Songs of All Time" (2004)
  - greatest songs of "rock and roll era"
  - based on poll of 172 "rock stars and leading authorities"
  - 100 song subset of list (top 20 songs from each decade)

The top 10 of the RS 500 list:

1   Bob Dylan, "Like a Rolling Stone" (1965)
2   The Rolling Stones, "(I Can't Get No) Satisfaction" (1965)
3   John Lennon, "Imagine" (1971)
4   Marvin Gaye, "What's Going On" (1971)
5   Aretha Franklin, "Respect" (1967)
6   The Beach Boys, "Good Vibrations" (1966)
7   Chuck Berry, "Johnny B. Goode" (1959)
8   The Beatles, "Hey Jude" (1968)
9   Nirvana, "Smells Like Teen Spirit" (1991)
10 Ray Charles, "What'd I Say" (1959)

How to analyze the harmony?

- Harmonic analysis is subjective
  - Published scores only show *absolute* chord labels
    - e.g. Bb, Gm7, C9
  - All songs individually analyzed by both authors

- Analyses (and more) available at:
  - theory.esm.rochester.edu/rock_corpus/
  - article on work forthcoming in *Popular Music*

The Analytical Notation

- Recursive, context-free notational system

               "Da Doo Ron Ron" (The Crystals, 1963)

A: I | IV | V | I |

In: I |*4

Vr: $A*2 I | IV | I | V | $A I |*2

So: $A*2

Ou: $A*4

S: [Eb] $In $Vr*2 $So $Vr $Ou

Analyzing the harmonic analyses

- Reduced analyses are expanded into chord lists
- Chord lists track absolute and chromatic relative roots

- Level of agreement between authors on chromatic relative roots was 92.4%
- Reported statistics represent the average of the statistics generated from the two authors' analyses

Distribution of chromatic relative roots

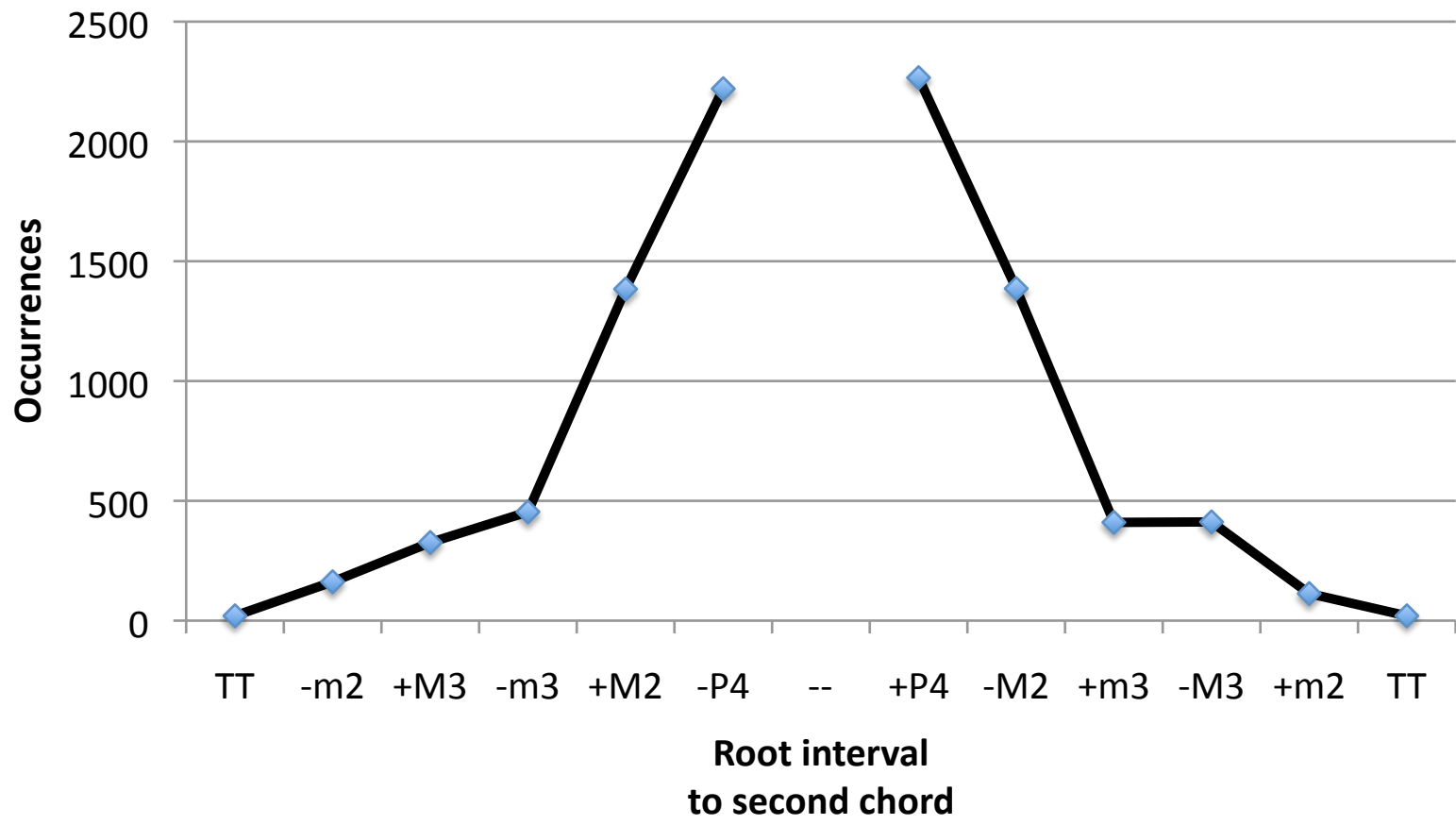|	Root	Instances	Proportion of total
1	I	3058	0.328
	bII	46	0.005
	II	336	0.036
	bIII	240	0.026
	III	174	0.019
2	IV	2104	0.226
	#IV	23	0.003
3	V	1516	0.163
	bVI	372	0.040
5	VI	674	0.072
4	bVII	748	0.081
	VII	38	0.004

The top five: I, IV, V, bVII, VI. (Quite different from common-practice music: note IV > V, and the high frequency of bVII.)

Distribution of (non-tonic) chromatic relative roots, overall and in pre-tonic and post-tonic position

Root	Overall	Pre-tonic	Post-tonic
bII	0.007	0.010	0.009
II	0.053	0.041	0.044
bIII	0.038	0.017	0.032
III	0.028	0.005	0.014
IV	0.336	0.396	0.356
#IV	0.004	0.002	0.001
V	0.241	0.269	0.240
bVI	0.059	0.071	0.036
VI	0.107	0.050	0.102
bVII	0.119	0.132	0.159
VII	0.006	0.005	0.005

Root motions on the "line of fifths"

Chord pairs with high correlations (above .35)

II, VI, and III form one highly inter-correlated group; bVII, bIII, and bVI form another (suggests some kind of modal organization—analogous to major/minor in common-practice music)

Conclusions

- Rock has its own harmonic logic, very different from that
    of common-practice music
- IV is the most common non-tonic chord in rock, and is
    especially common preceding the tonic
- Rock does not show strong asymmetries in root motion;
    ascending and descending 5th motions are roughly
    equally common
- Frequency of root motions corresponds strongly to
    circle-of-fifths distance
- Patterns of co-occurrence suggest "flat-side" harmonies tend
    to occur together, as do "sharp-side" harmonies—similar
    to major/minor

Directions for future work

- Analyze more songs??
- Look at larger patterns – e.g. harmonic "trigrams"
- Look at correspondences with form and meter
- Refine the corpus (to reflect a narrower definition of
    rock?)
- Use statistical clustering methods to divide the corpus into
    stylistic categories

Thank you!

References

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