Open Problems in Pop Music

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Jane Street 5-min Presentation
Chords in pop music fall under roughly four categories, and most songs use four chord phrases.

Pop songs often choose a fixed permutation of these four chord categories for the whole song (we will ignore songs that repeat categories).

I’ve followed the chord progressions in pop hits since the 90’s.
Tonic Chord, I

- Some Alternatives: $I^6$, $I^9$, $I^9_6$
- In C major, this refers to the C major triad
- Alternative Notations: C/E, C$^9_6$, C$^{MAJ7}$
Dominant Chord, V

- Some Alternatives: $V^6$, $V^7$, $V^9$, $I^6_4$, $V^{13}_7$
- In C major, this refers to the G major triad
- Alternative Notations: G, G/B, G$^7$
Pre-Dominant Chord, IV

- Some Alternatives: ii, ii$^6$, IV$^7$, ii$^7$, II$^7$, ii$^9$

- In C major, this refers to the F major triad (or d minor/D major triad)

- Alternative Notations: F, d, D$^7$/F#
Relative Minor Chord, vi

- Some Alternatives: vi\(^7\)
- In C major, this refers to the a minor triad
- Alternative Notations: a
I – vi – IV – V

- Most theoretically sound by Classical music principles (I to start, pre-dominant before dominant, V is penultimate chord)
- Every OTHER chord of Pachelbel’s canon

- We Are Young (Fun.)
- Baby (Justin Bieber)
- Blank Space (Taylor Swift)
- Walking in Memphis
Cycles of I – vi – IV – V

- vi–IV–V–I:
  - Barbie Girl (Aqua)

- IV–V–I–vi:
  - Viva la Vida (Coldplay)

- V–I–vi–IV:
  - OPEN!
Also very Classically sound
Resembles the first half of Pachelbel’s canon
Probably the most popular cycle

- I’m Yours (Jason Mraz)
- Irreplaceable (Beyonce)
- Don’t Stop Believing (Glee/Journey)
- Take a Bow (Rihanna)
Cycles of I – V – vi – IV

- **vi–IV–I–V:**
  - Apologize (Timbaland), Love the Way you Lie (Rihanna), Just a Dream (Nelly), Grenade (Bruno Mars), So Sick (Ne-Yo), Stereo Hearts (Adam Levine)
  - Caught ABSOLUTE FIRE in ~2010

- **IV–I–V–vi:**
  - Big Girls Don’t Cry (Fergie) chorus

- **V–vi–IV–I:**
  - Time After Time, Wannabe (Spice Girls)
I – IV – vi – V

- Somewhat Classically sound
- What Makes You Beautiful (One Direction)
- Waving Flag (song for Haiti)
- Without You (Usher)
- For the First Time in Forever (Frozen) verse
Cycles of I – IV – vi – V

- vi–V–I–IV:
  - Breakeven (The Script) verse

- IV–vi–V–I:
  - She Likes Me For Me (Blessed Union of Souls)

- V–I–IV–vi:
  - OPEN!
I – vi – V– IV

- Descending bass line
- Surprisingly unpopular given how natural it is
- Cast Away (Green Day)
- Two Princes (Spin City)
Cycles of I – vi – V – IV

- **vi–V–IV–I:**
  - Pray (Justin Bieber)

- **IV–I–vi–V:**
  - Call Me Maybe (Carly Rae Jepsen) chorus, What’cha Say (Jason Derulo), I’m Coming Home (Skylar Grey), As Long As You Love Me (Backstreet Boys)

- **V–IV–I–vi:**
  - OPEN!
I – V – IV – vi and Cycles

- OPEN!

- vi–I–V–IV:
  - Disturbia (Rihanna), Rehab (Rihanna), Impossible (Shontelle)

- IV–vi–I–V:
  - Incomplete (Backstreet Boys)

- V–IV–vi–I:
  - A Year Without Rain (Selena Gomez)
I – IV – V– vi and Cycles

- OPEN! (Why does it sound so weird?)
- Ascending bass line

- vi–I–IV–V: OPEN!

- IV–V–vi–I:
  - Bad Romance (Lady Gaga) first half of chorus..

- V–vi–I–IV: OPEN!
Conclusion

- 7 of the 24 permutations open (to my knowledge)
- More than half of them have V to start the phrase
- Maybe you can be the next trendsetter in pop music!