





Evolution & Eternity of Pop Music

Lyrics Text Mining Analysis
MGTA 495

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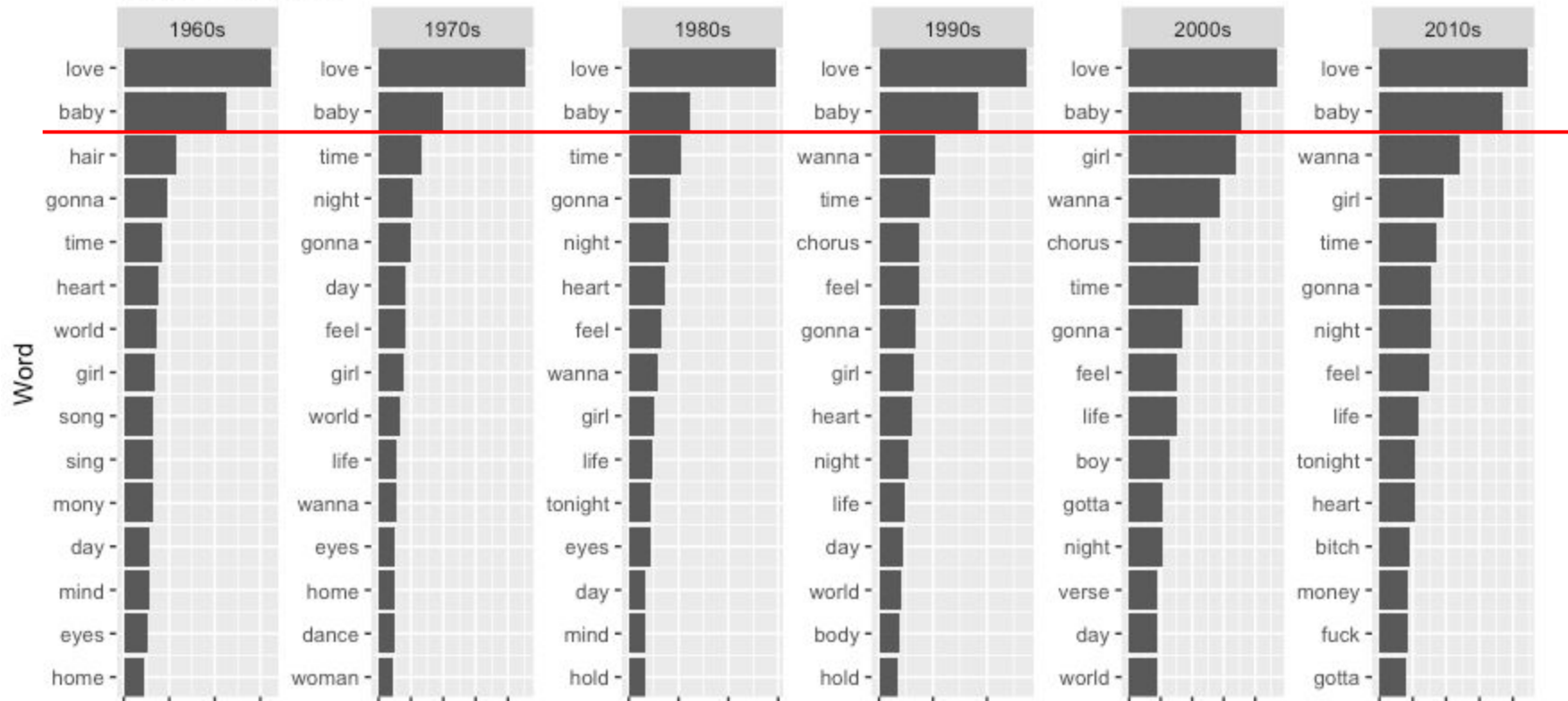
Business Questions:

- ❖ How did music topics change over time?
- ❖ Are pop song lyrics getting more repetitive?
- ❖ How did sentiment on popular song lyrics change over time?
- ❖ Can we classify the genre of a song based on its lyrics?

1. How did music topics change over time?

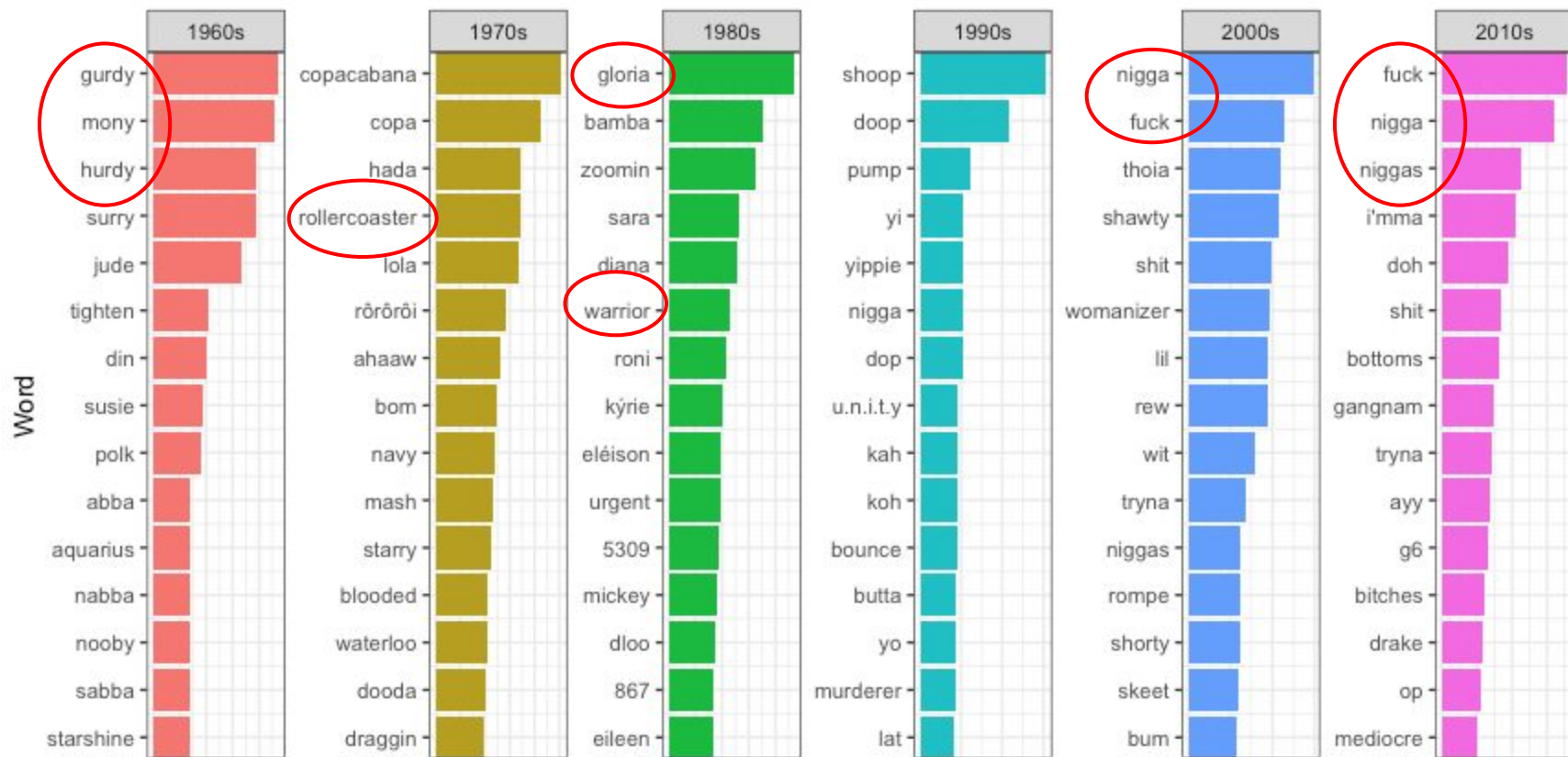
Top Words by decade

Based on 4177 lyrics



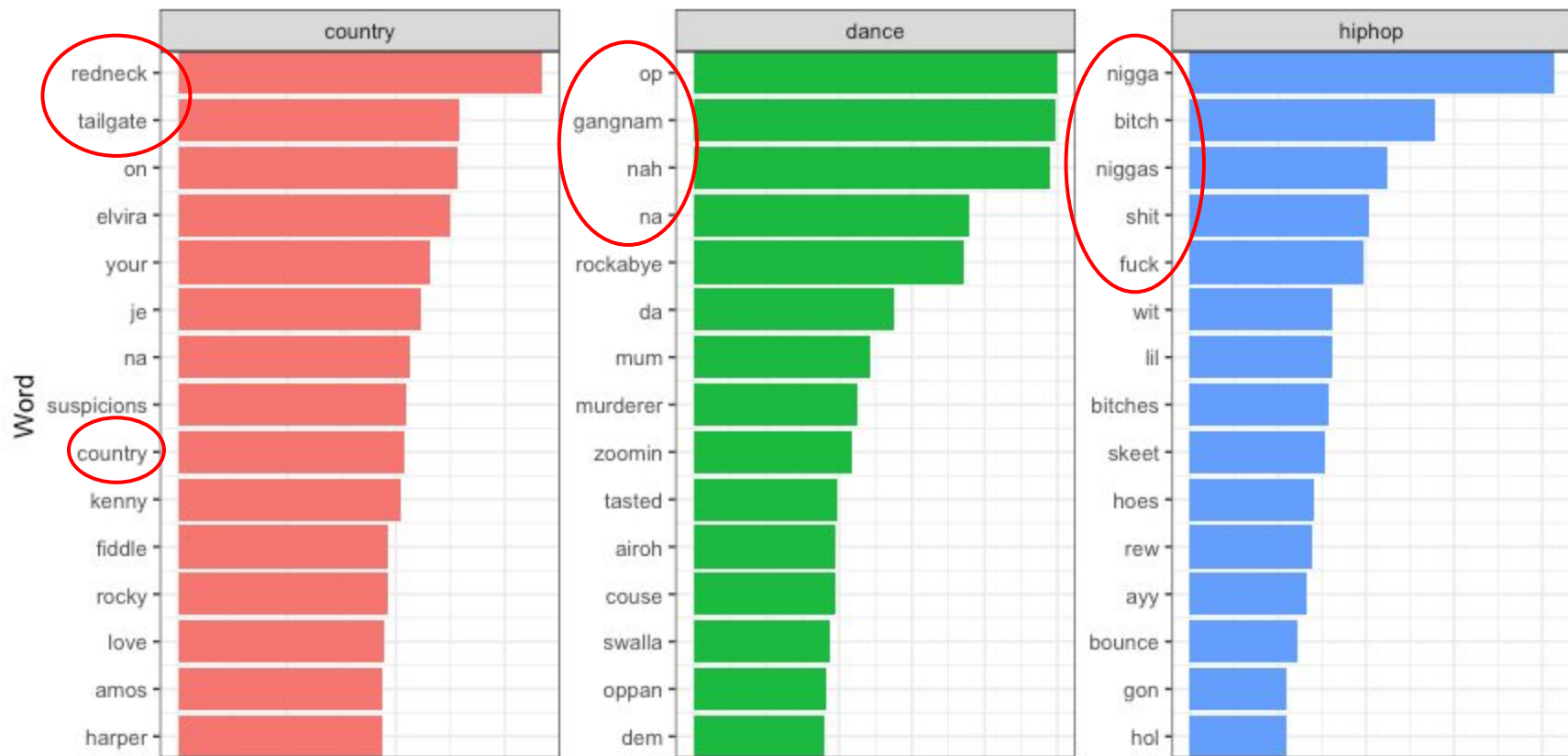
Word Frequency by Decade

Top TF-IDF Words for 6 decades



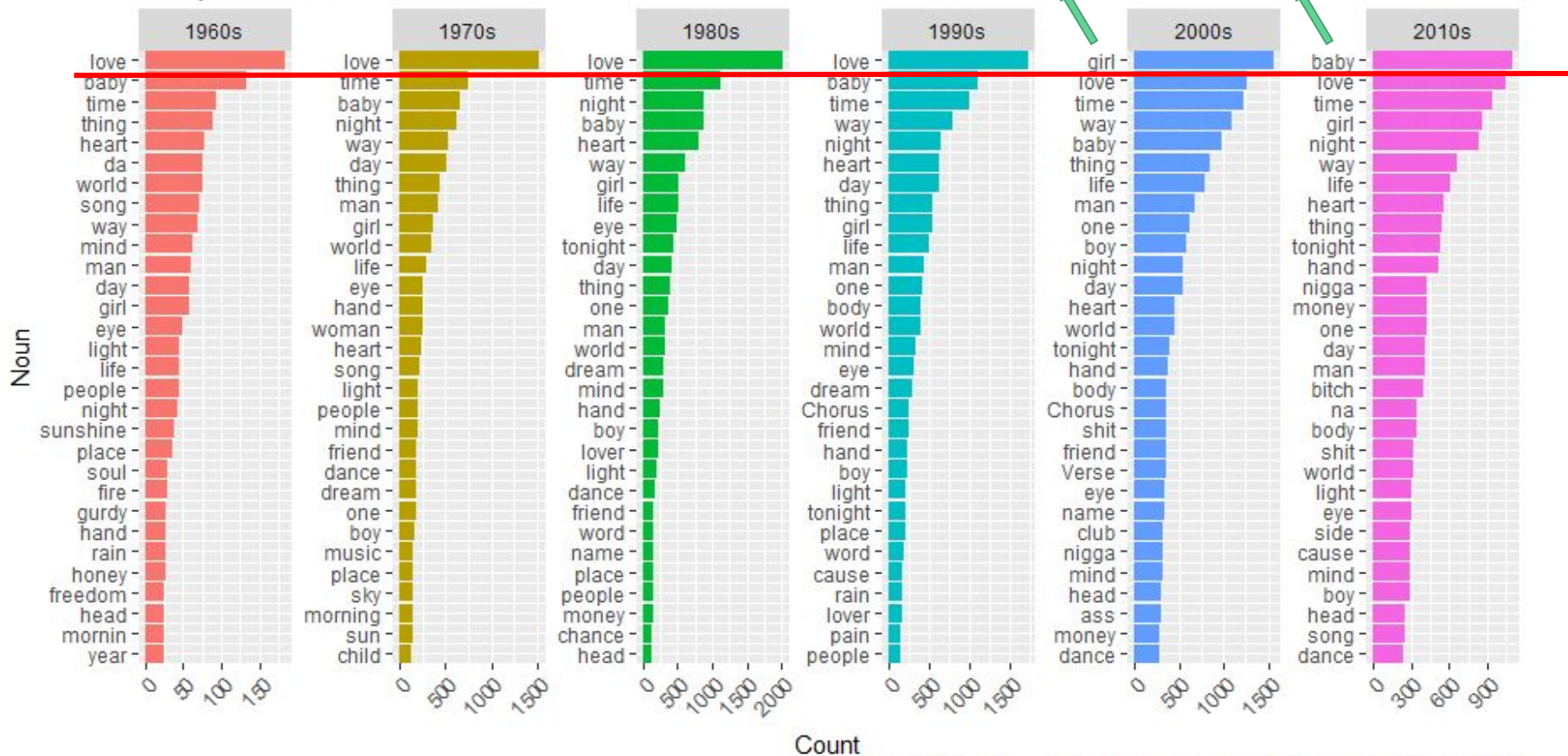
TF-IDF

Top TF-IDF Words for 3 genres



Top Nouns by Decades

4177 lyrics from billboard-hot-100



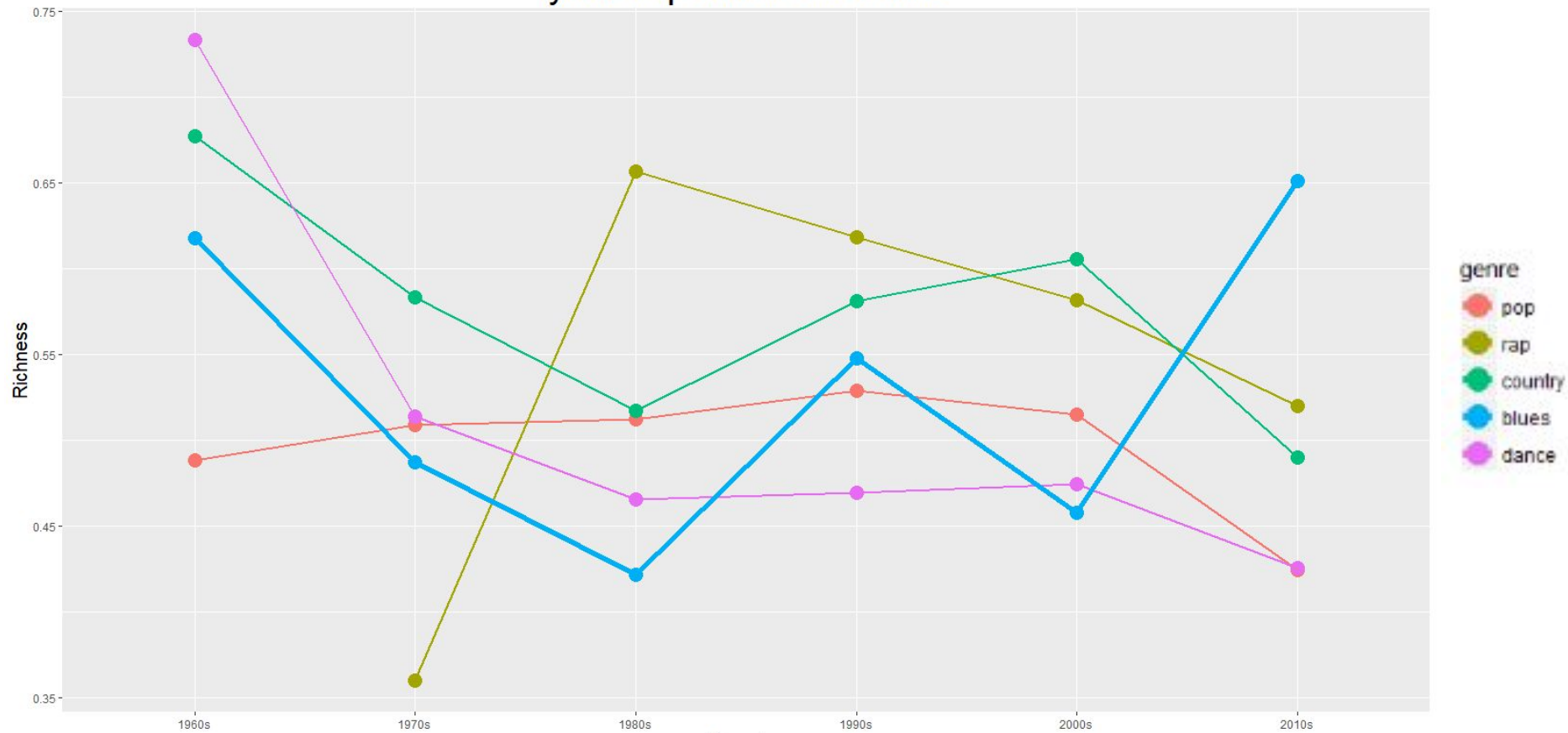
data sources: Wikipedia, azlyrics.com, and metrolyrics.com /n 1968 ~ 2017



I sing it for that much times? !

2. Are pop song lyrics getting more repetitive?

lyrics repetition over time



How repeated a song could be?

We got a winner -->

That's the Way (I Like It)

KC and the Sunshine Band

1976

Disco-Pop

Richness: 5%

rank:45

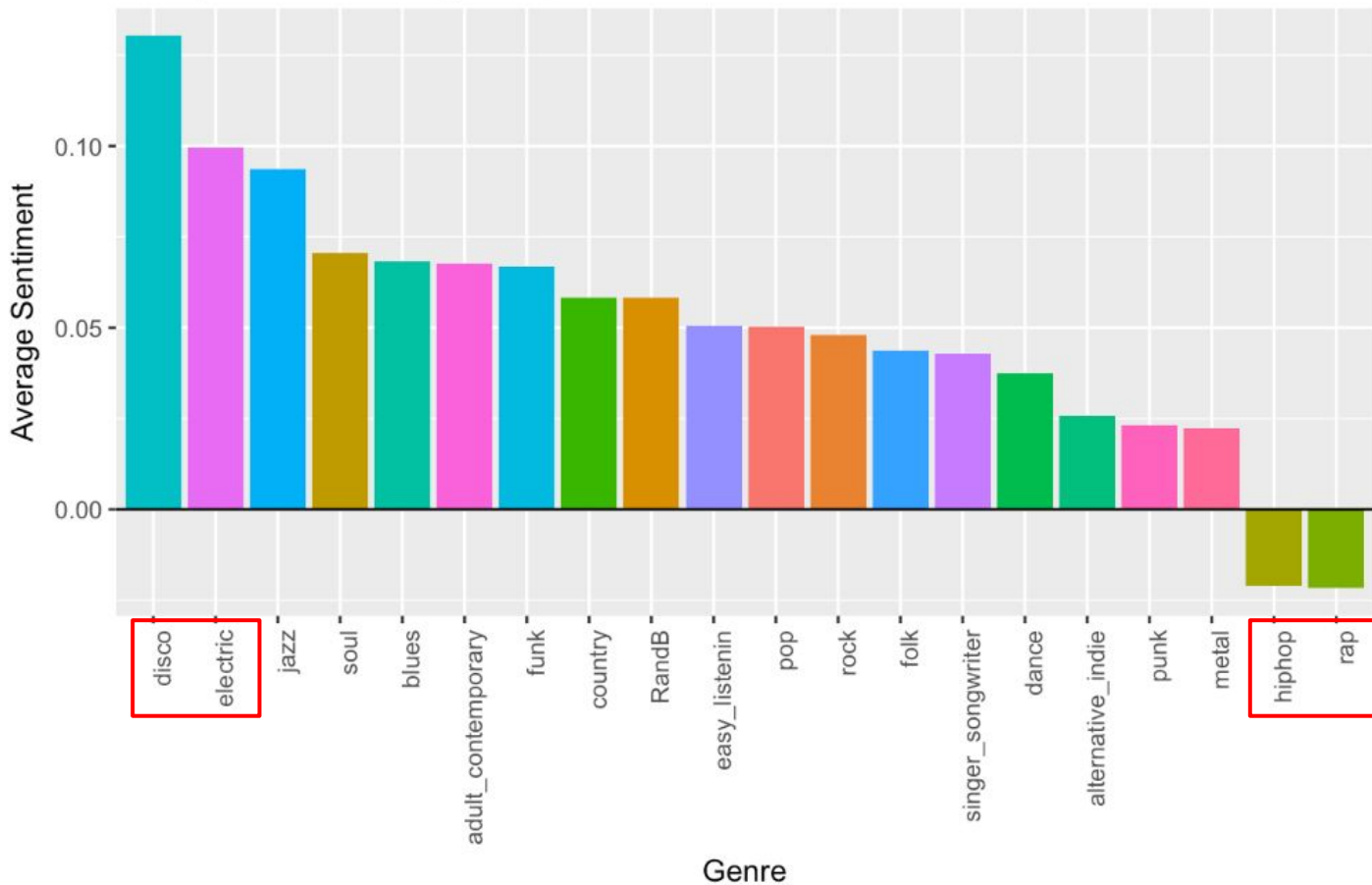
Do do do do do do do do do Do do do do do do do do do Do do do do do do do do do do do Oh, that's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh When you take me by the hand Tell me I'm your lovin' man When you give me all your love And do it, babe, the very best you can Oh, that's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh When I get to be in your arms When we're all, all alone When you whisper sweet in my ear When you turn, turn me on Oh, that's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh Babe Babe (That's the way, uh-huh) (That's the way, uh-huh) Babe Babe (That's the way, uh-huh) (That's the way, uh-huh) That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh That's the way, uh-huh, uh-huh I like it, uh-huh, uh-huh I like it, uh-huh, uh-huh Do do do do do do do do do Do do do do do do do do do Do do do do do do do do do do do ...



3. How did sentiment on song lyrics change over time?

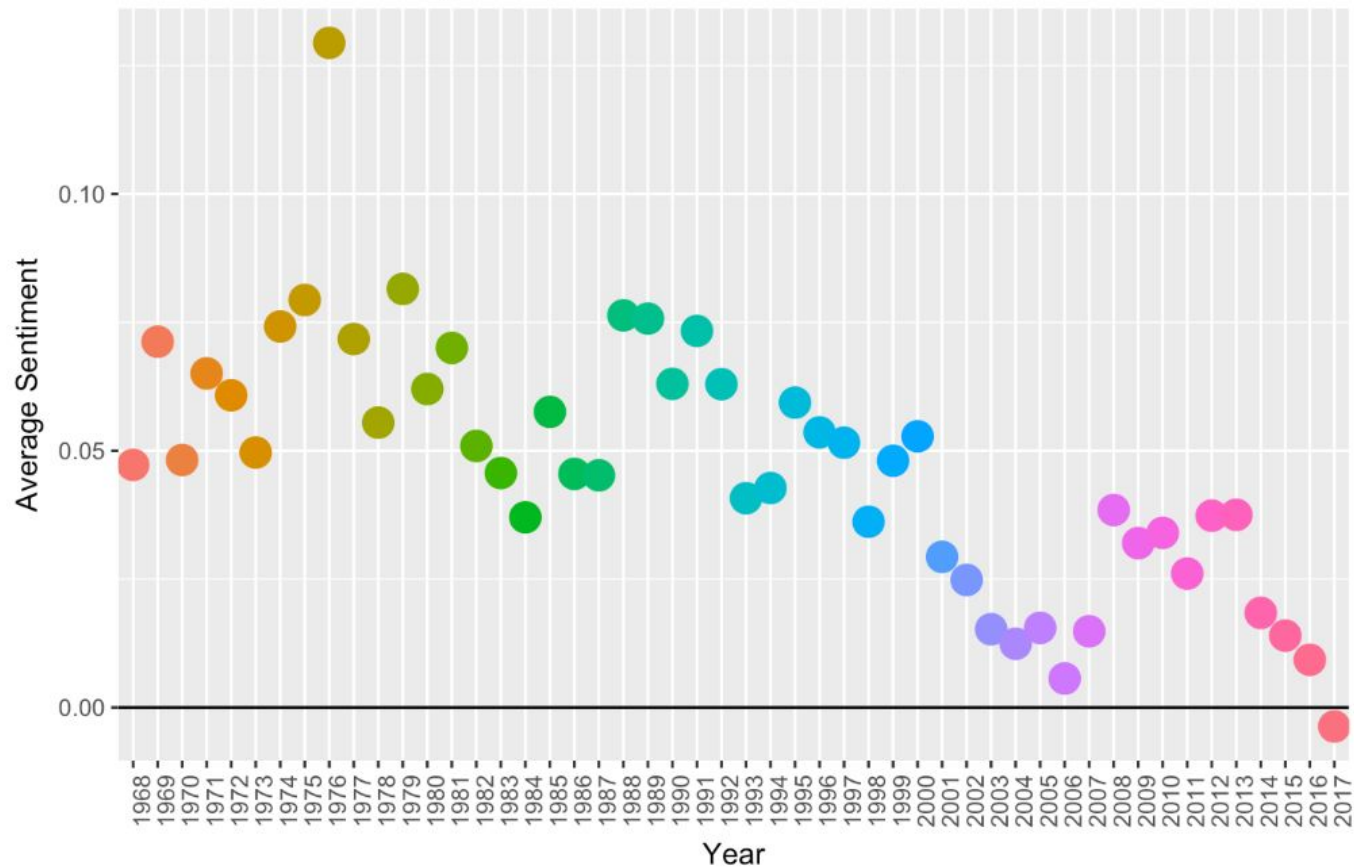
Average Sentiment by Genre

4177 Lyrics, Billboard Yearly Hit 100, 1968 - 2017



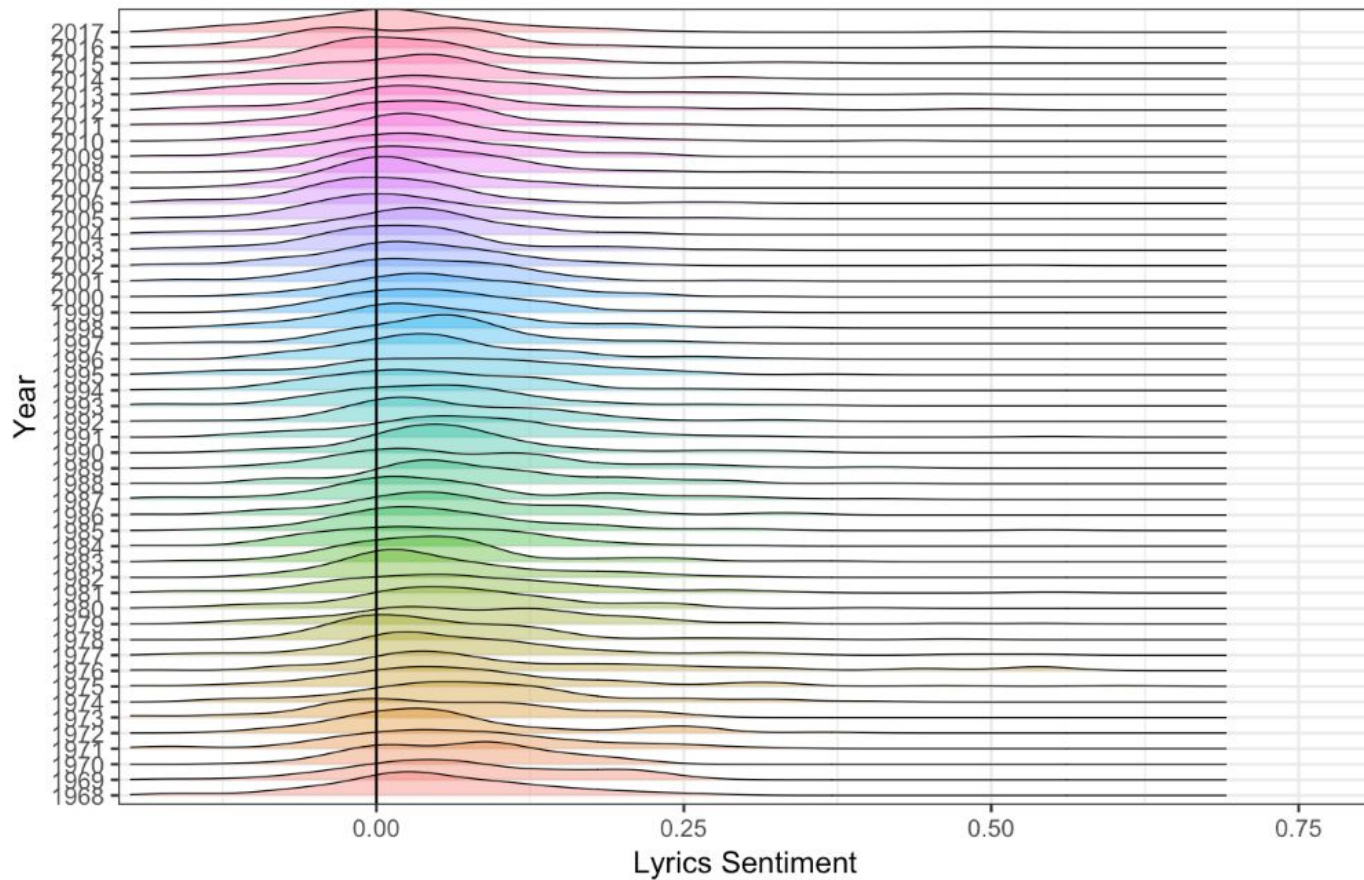
Average Sentiment by Year

4177 Lyrics, Billboard Yearly Hit 100, 1968 - 2017



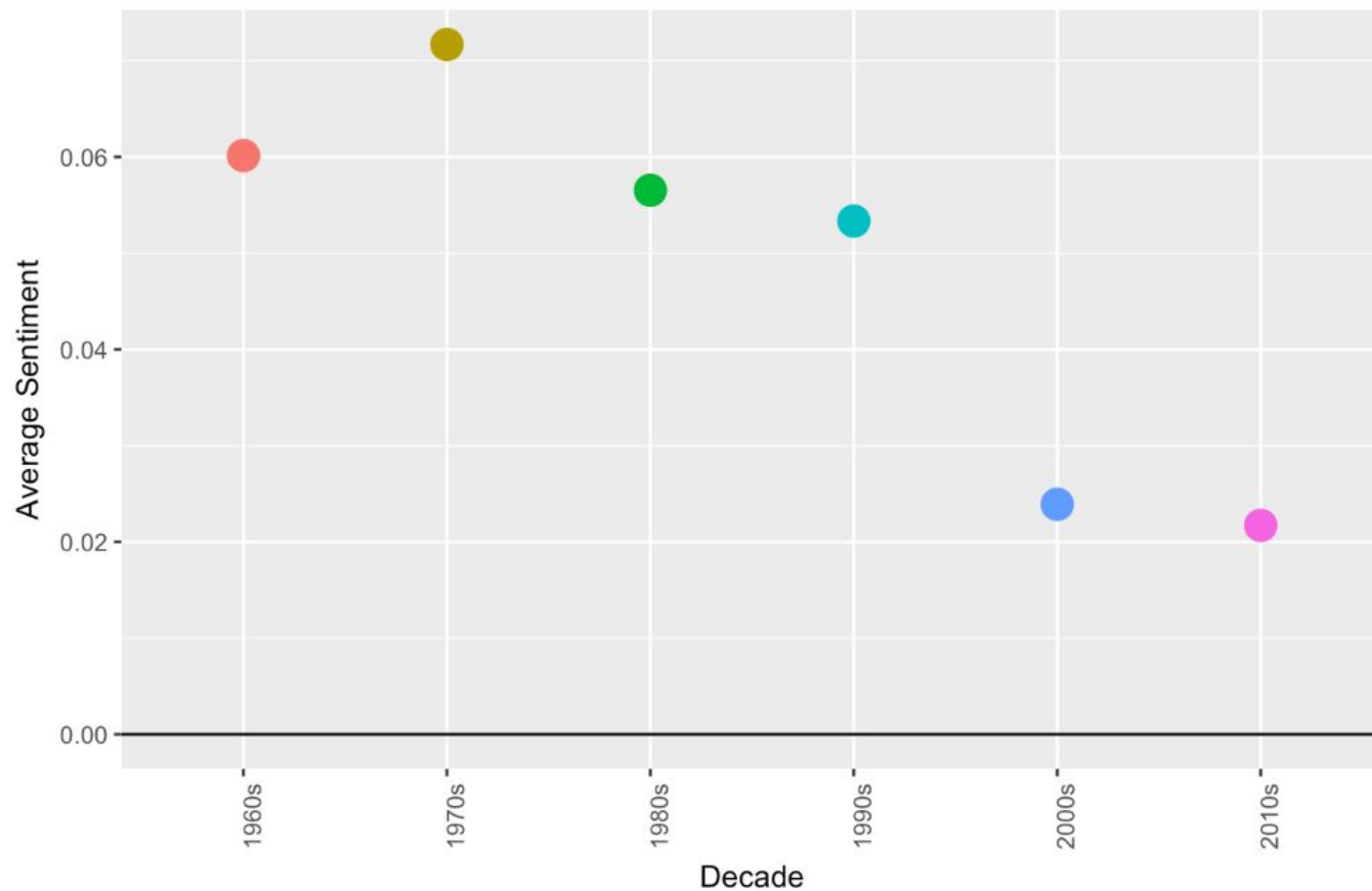
Distribution of Lyrics Sentiment by Year

4177 Lyrics, Billboard Yearly Hit 100, 1968 - 2017

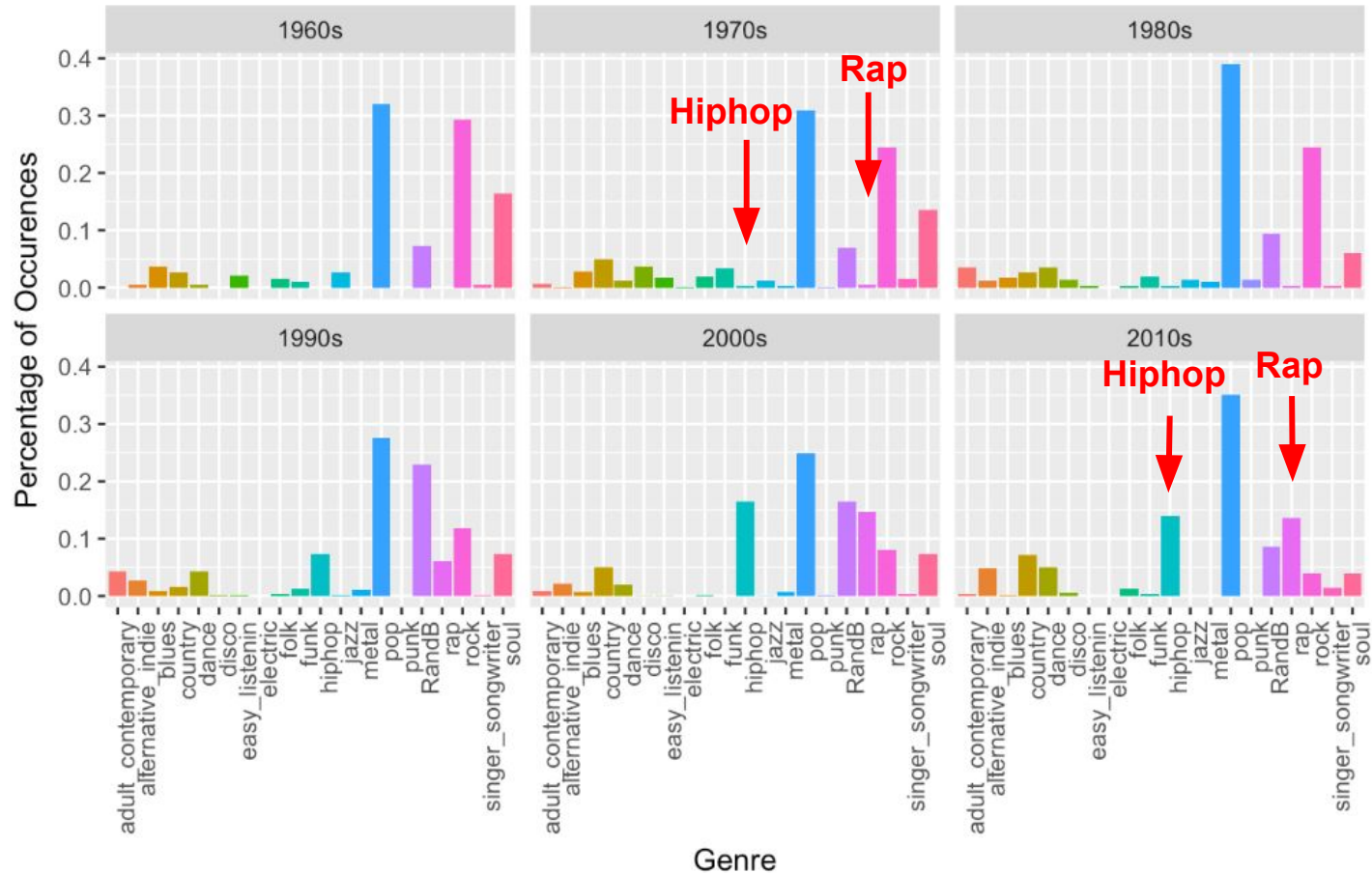


Average Sentiment by Decade

4177 Lyrics, Billboard Yearly Hit 100, 1968 - 2017



4177 Lyrics, Billboard Yearly Hit 100, 1968 - 2017



The song with the highest avg sentiment in 1970s

I want to know Just how you feel Said-a I want to know If what you feel is real 'Cause there is a reason, yeah For the things that I say I want to love you, girl In a special way We've been together For so very long I would hate to break up Break up our happy home The way we stand and the way we lie The way we love and the way we cry Of all these things there lies a tie Makes me feel that it's worth a try I'll be **good** to you **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you 'Cause there is a reason For the things that I say I wanna love you, girl In a special way We've been together For so very long I would hate to break up Break up our happy home Take a step now, and let me know how All of your ways, girl And all your know-how's I'll be **good** to you **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you I'll be **good** to you, **good** to you, **good** to you

- **I'll Be Good to You BY The Brothers Johnson (1976)**
- **Funk**

The song with the lowest avg sentiment in 2010s

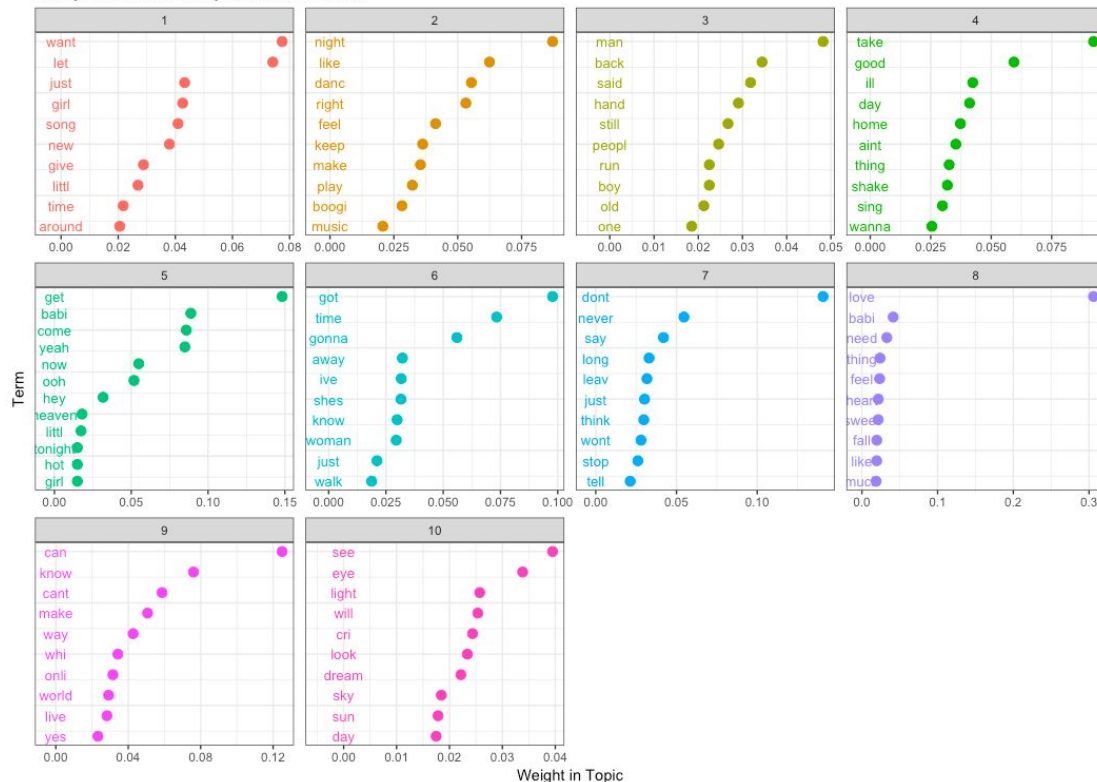
Wicked tunes, you know what I'm sayin'? Wassup **Wicked, wicked, wicked, wicked, wicked** Hold up, **wicked, wicked, wicked, wicked, wicked** Hold up, **wicked, wicked, wicked, wicked** Stand up in the motor, bust the dashboard Stand up in the motor, bust the dashboard Hold up, **wicked, wicked, wicked, wicked, wicked** Candles burning, money burning, graveyard these niggas Phantom parkin', big dawg barkin' hey Blood tales on me, oh-oh-oh-oh Shawty want that wig, oh-oh-oh-oh I'm drippin' Cartier, oh-oh-oh-oh Put a gold bird on you, that's what's happening I put that lingo on her, she was Spanish I fill a one liter up with Xannies This continental and it's panoramic It's complimentary to the savages You fuck around with me, it be a tragedy I want green, green, green, all asparagus I drink lean, lean, lean it ain't embarrassing **wicked, wicked, wicked, wicked, wicked** Hold up, **wicked, wicked, wicked, wicked** Woah, **wicked, wicked, wicked, wicked, wicked** Now she going, now that bitch going I purchase Avion and now she lit, huh Wedding band rings on me lit, huh Married to the game, I'm the shit, huh Woah, woah, woah, woah Bitch we made men We ain't pullin' up in cribs that we can't get You can't pull a bitch on Instagram I ain't hit, huh And then she tellin' lies about me cause she ain't shit, uh She want that big-big dog status I was in the alley with them nickel bags, tallyin' Now I'm Taliban gang status, that's what's happenin' And you niggas can't get close cause you don't know me It ain't no more dip and dabbin', hangin' low key These bitches see me and they panic I can't believe it, I was on the corner gamblin' **wicked, wicked, wicked, wicked, wicked** Hold up, **wicked, wicked, wicked, wicked, wicked** Stand up in the motor, bust the dashboard Stand up in the motor, bust the dashboard **wicked, wicked, wicked, wicked, wicked** Hold up, **wicked, wicked, wicked, wicked**

- **Wicked BY Future (2016)**
- **Hip-hop/rap**

Topics Discussed in 1970s

Top Words by 20 Topic LDA Models in 1970s

720 Lyrics, Billboard Yearly Hit 100, 1968 - 2017

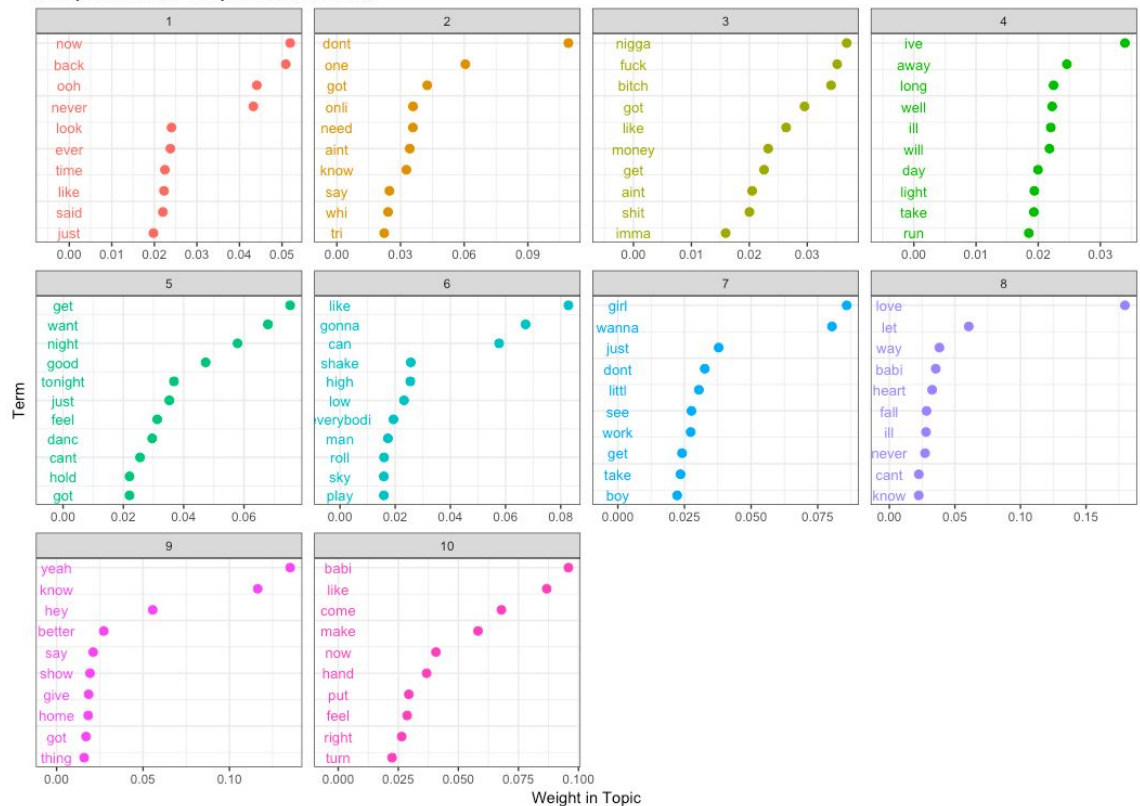


- Dance with music during night
- Fall into love with sweet heart
- See light in from your eyes in a sunny day
- Stay with hot girls tonight

Topics Discussed in 2010s

Top Words by 20 Topic LDA Models in 2010s

752 Lyrics, Billboard Yearly Hit 100, 1968 - 2017



- Run away all day long
- Girls don't wanna see boys
- Nigga / f*ck / money / bitch

4. Can we classify the genre of a song based on its lyrics?

How?

01

Objectives

- To recognize whether a song belongs to rap genre or not in a given verse

02

Data preprocessing

- Tokenize the words
- Remove stop words
- Apply stemming to the words

03

Textual feature engineering

- Bag of words (one-hot embedding)
- Bag of words (word frequency)
- Word2Vec on tokens of lyrics

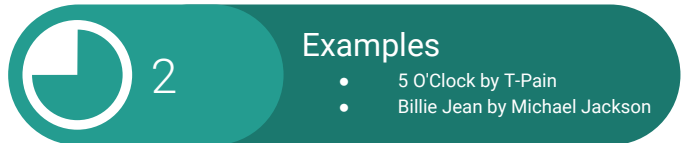
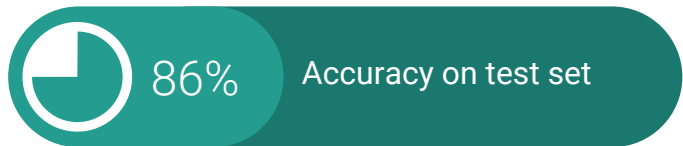
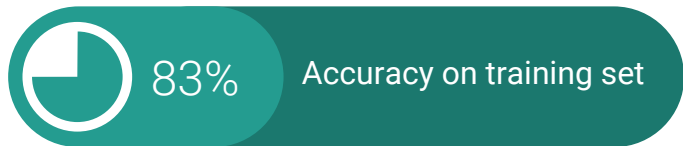
04

Classification models

- SVM: 10-fold cross-validated (repeated 3 times)



Model Results



Billie Jean

Michael Jackson

She was more like a beauty queen from a movie scene

I said don't mind, but what do you mean, I am the one

Who will dance on the floor in the round

She said I am the one, who will dance on the floor in the round

She told me her name was Billie Jean, as she caused a scene

Then every head turned with eyes that dreamed of being the one

Who will dance on the floor in the round

Billie Jean is not my lover

She's just a girl who wishes that

But the kid is not my brother

She says I am the one, who is not my

....

POP

5. Conclusion

Conclusion

- Love is the most persistent theme
- Word repetition increased over the decades
- Offensive words appeared more frequently
- Sentiment in pop music is decreasing over time
- Music genre classification requires more rigorous methods



Conclusion

Music is the vernacular of human soul.

- Geoffrey Latham