

What is Love? or: The Evolution of Music Lyrics

Kevin Zecchini
03/04/2016



Motivation

How important are lyrics to genre definition?

How does word usage in lyrics change over time?

How do song topics change over time?

The Data

~ 145,000 songs from 1950 to 2011

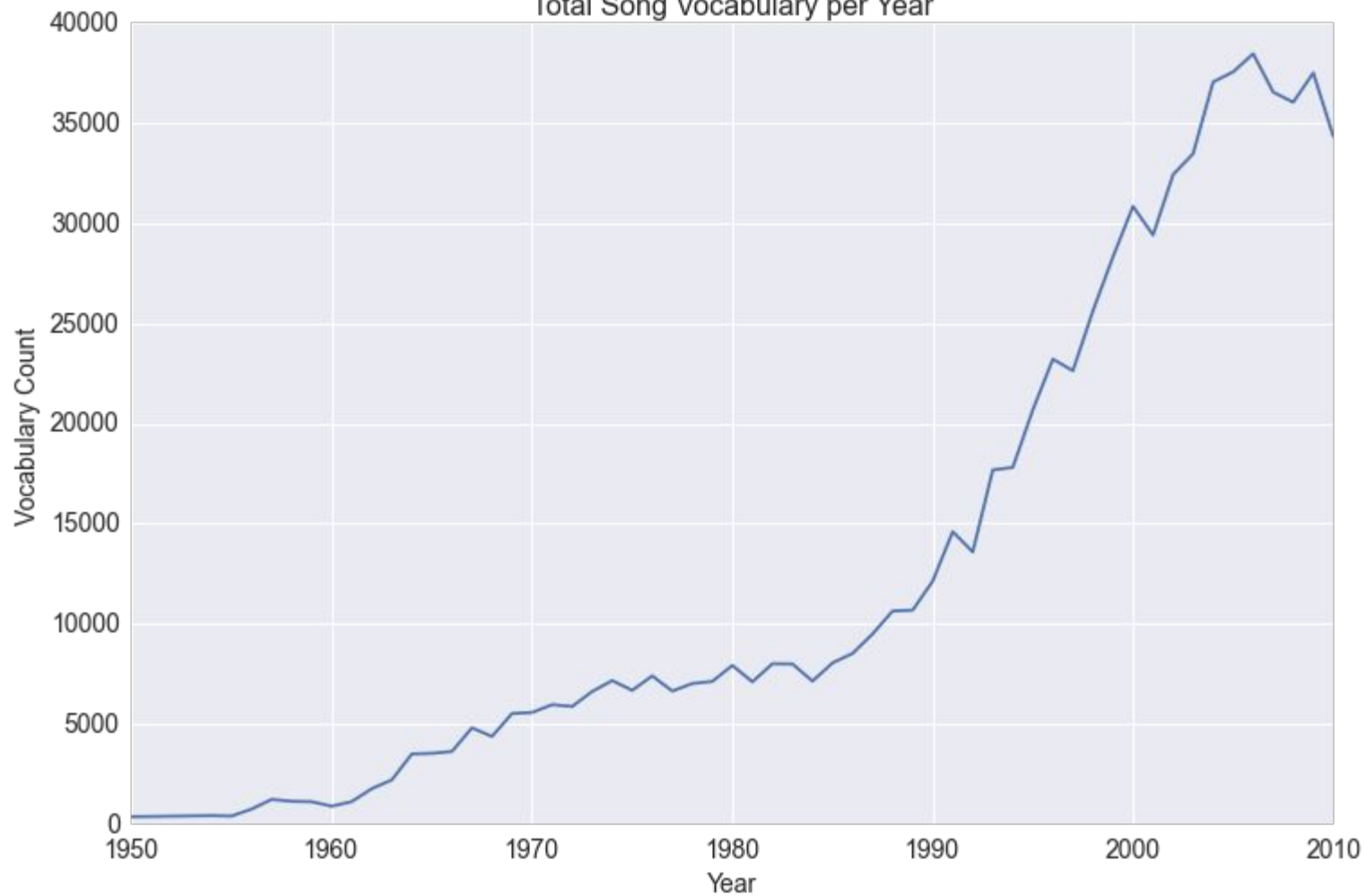
Information obtained:

- Lyrics
- Song Title
- Artist Name
- Album Year
- Album

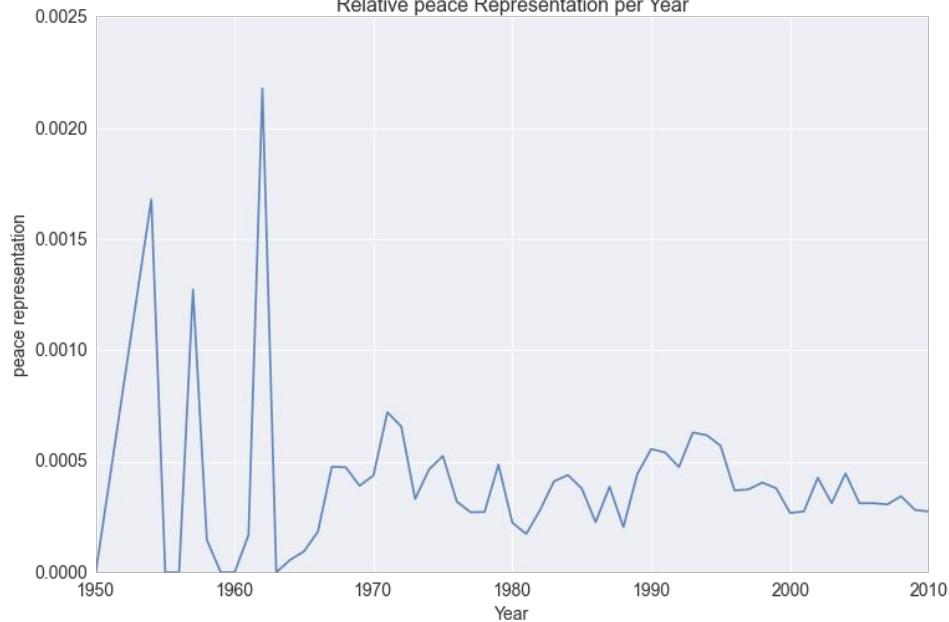
Analysis

- Natural language processing
 - Difficult to remove all stopwords
 - Contractions and phonetic sounds prevalent
- Explore trends over time
- Cluster words over entire corpus
 - By TF-IDF weightings
 - KMeans clustering

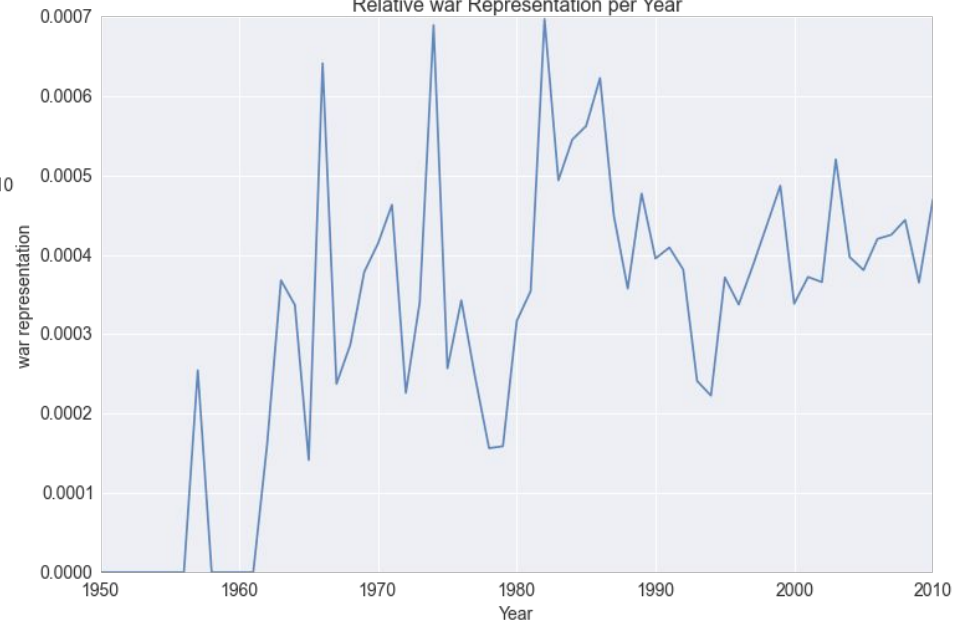
Total Song Vocabulary per Year



Relative peace Representation per Year



Relative war Representation per Year



KMeans Clustering on TF-IDF

28 Clusters Total - Some Highlights:

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- Cluster 1: christma, merri, santa, mistleto, snow, tree, bell, year, sleigh, carol
- Cluster 24: lord, god, jesus, prais, holi, heaven, christ, glori, sing, o

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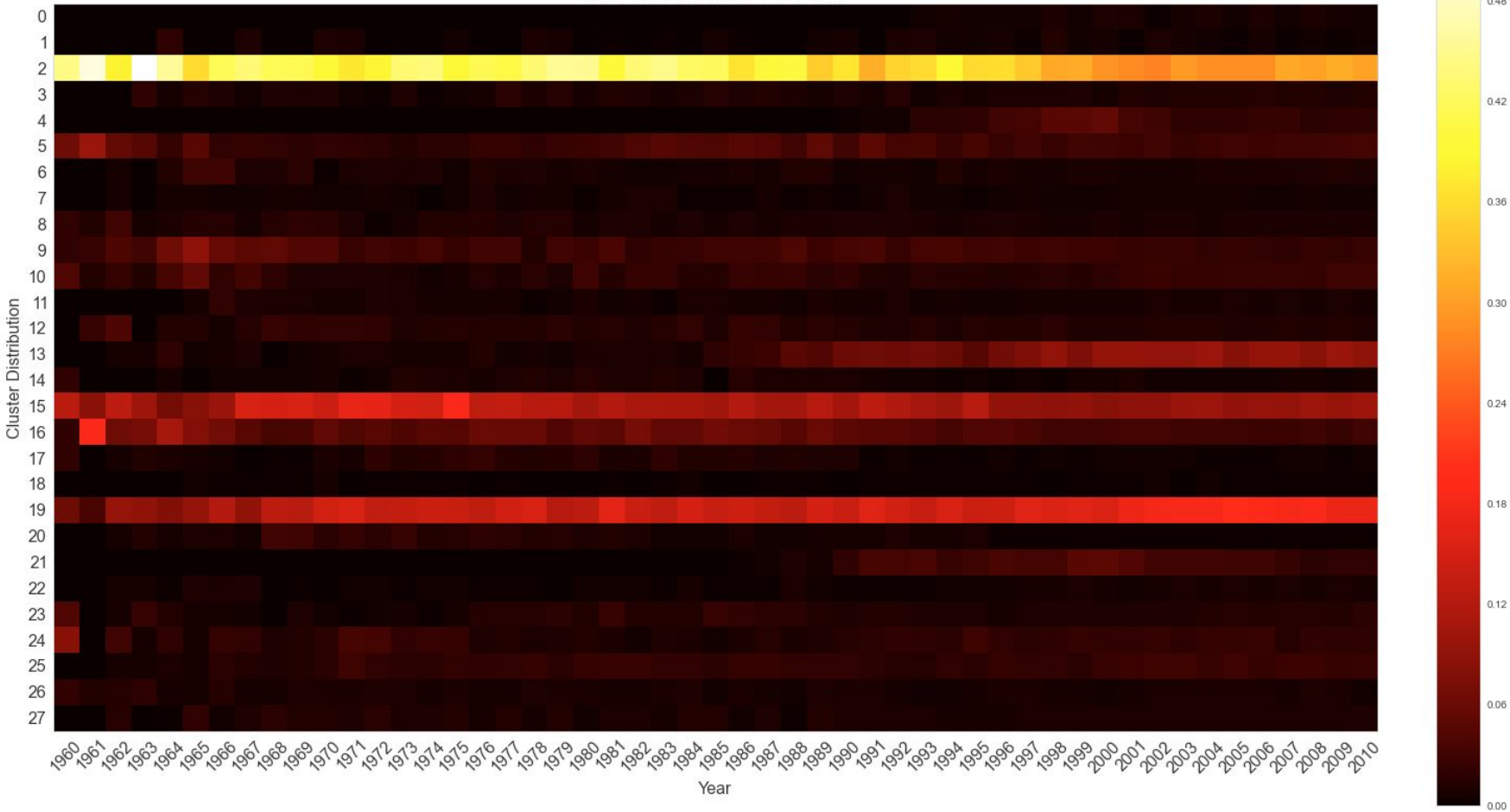
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- Cluster 24: lord, god, jesus, prais, holi, heaven, christ, glori, sing, o
- Cluster 2: love, one, man, well, littl, feel, time, back, danc, look
- Cluster 8: good, feel, time, love, bad, babi, thing, enough, day, never
- Cluster 15: dream, sun, rain, light, sky, night, fall, shine, eye, sing
- Cluster 5: heart, break, love, apart, broken, feel, fall, tear, never, hold
- Cluster 11: goodbye, cri, never, time, love, leav, last, tri, tell, said
- Cluster 18: shame, blame, pain, love, name, away, feel, cri, never, life
- Cluster 22: miss, love, kiss, babi, wish, never, feel, time, much, gone

KMeans Clustering on TF-IDF

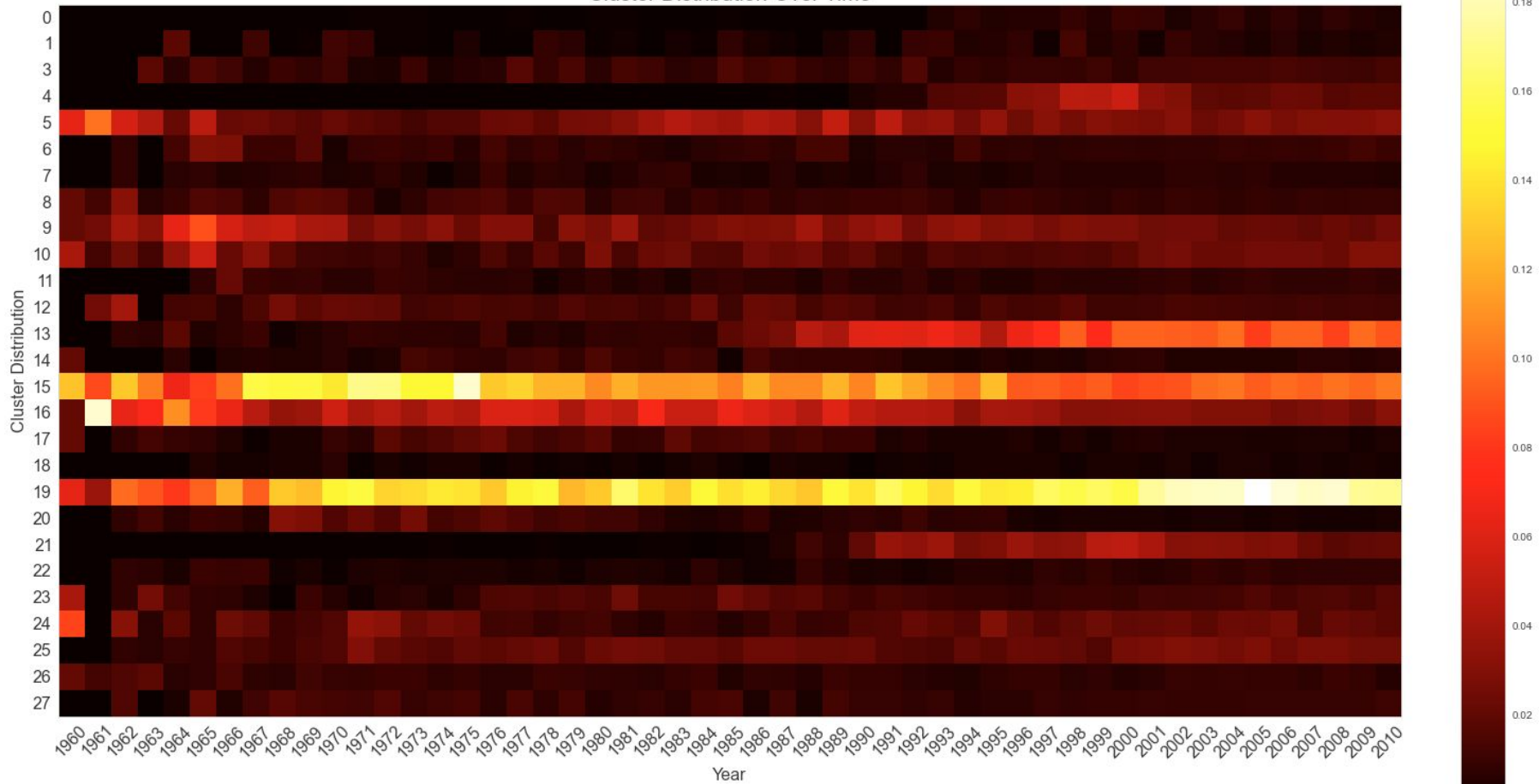
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- Cluster 22: miss, love, kiss, babi, wish, never, feel, time, much, gone
- Cluster 21: [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], ass, yo, em, [REDACTED]
- Cluster 4: [REDACTED], [REDACTED], [REDACTED], [REDACTED], yo, [REDACTED], money, wit, [REDACTED], [REDACTED]
- Cluster 17: rock, roll, n, babi, music, danc, night, readi, soul, us

Cluster Distribution Over Time



Year



Conclusions

- Events contribute to word usage in music
 - Reflecting the times
- Songs lyrics are fairly constant over time - mostly about love
- Most significant change in lyrics comes from both the digital age and the rise of hip-hop and rap
 - Increase corpus exponentially
 - Extremely diverse vocabulary

Thank You!

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Future Work

- Expand the word search into an app using Flask
- Explore topic modeling further
 - LDA - draw meaning
- Change analysis approach - subset documents
 - Filter on subsets
 - Billboard Hot 100, Top 40 per year, genre
 - Clustering by decade
 - Clustering methods based on different distance metrics (cosine)
 - DBSCAN, Hierarchical Clustering
 - Word2vec

LDA

Topics:

- 0.) 0.011*home + 0.010*day + 0.010*back + 0.009*love + 0.007*well + 0.007*dream + 0.007*cri + 0.007*sing
- 1.) 0.023*feel + 0.014*night + 0.014*love + 0.012*fall + 0.011*light + 0.011*danc + 0.011*tonight + 0.011*world
- 2.) 0.018*one + 0.009*peopl + 0.009*time + 0.008*world + 0.005*back + 0.005*turn + 0.004*god + 0.004*life
- 3.) 0.024*time + 0.020*never + 0.015*away + 0.014*feel + 0.011*tri + 0.010*life + 0.010*day + 0.010*thing
- 4.) 0.011*money + 0.009*niggaz + 0.009*nigga + 0.009*bitch + 0.009*fuck + 0.006*never + 0.006*shit + 0.006*back
- 5.) 0.019*nigga + 0.012*boy + 0.009*em + 0.009*man + 0.008*back + 0.008*yo + 0.006*live + 0.006*real
- 6.) 0.014*believ + 0.009*pleas + 0.008*heart + 0.008*burn + 0.008*world + 0.008*life + 0.008*love + 0.007*live
- 7.) 0.080*love + 0.042*babi + 0.022*girl + 0.022*need + 0.016*one + 0.014*give + 0.013*tell + 0.012*right
- 8.) 0.032*da + 0.020*mi + 0.018*dem + 0.016*di + 0.009*whoa + 0.008*fi + 0.008*lord + 0.007*de
- 9.) 0.019*nigga + 0.016*fuck + 0.013*shit + 0.011*bitch + 0.008*girl + 0.007*back + 0.007*yo + 0.007*talk

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Cluster 11: goodbye, cri, never, time, love, leav, last, tri, tell, said

Cluster 12: someon, somebodi, need, els, love, find, feel, never, one, life

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Example Data

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{ u'album': u'Cold Spring Harbor',  
  u'album_year': 1971,  
  u'lyrics': u"She's got a way about her\nI don't know what it is\nBut I know that I can't live without her\nShe's got a way of pleasin'\nI don't know what it is\nBut there doesn't have to be a reason anyway\nShe's got a smile that heals me\nI don't know why it is\nBut I have to laugh when she reveals me\nShe's got a way of talkin'\nI don't know why it is\nBut it lifts me up when we are walkin' anywhere\n\nShe comes to me when I'm feelin' down\nInspires me without a sound She touches me\nand I get turned around\nShe's got a way of showin'\nHow I make her feel\nAnd I find the strength to keep on goin'\nShe's got a light around her\nAnd ev'rywhere she goes\nA million dreams of love surround her\nnev'rywhere\n\nShe comes to me when I'm feelin' down\nInspires me without a sound\nShe touches me and I get turned around\n\nShe's got a smile that heals me\nI don't know why it is\nBut I have to laugh when she reveals me\nShe's got a way about her\nI don't know what it is\nBut I know that I can't live without her anyway",  
  u'name': u'BILLY JOEL',  
  u'song': u"She's Got A Way"}
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Relative love Representation per Year

