

The Language of Music

Kimi Spencer

7 August 2012

Music Lyrics & Culture

“One cultural product—word use in popular song lyrics—changes over time in harmony with cultural changes.”

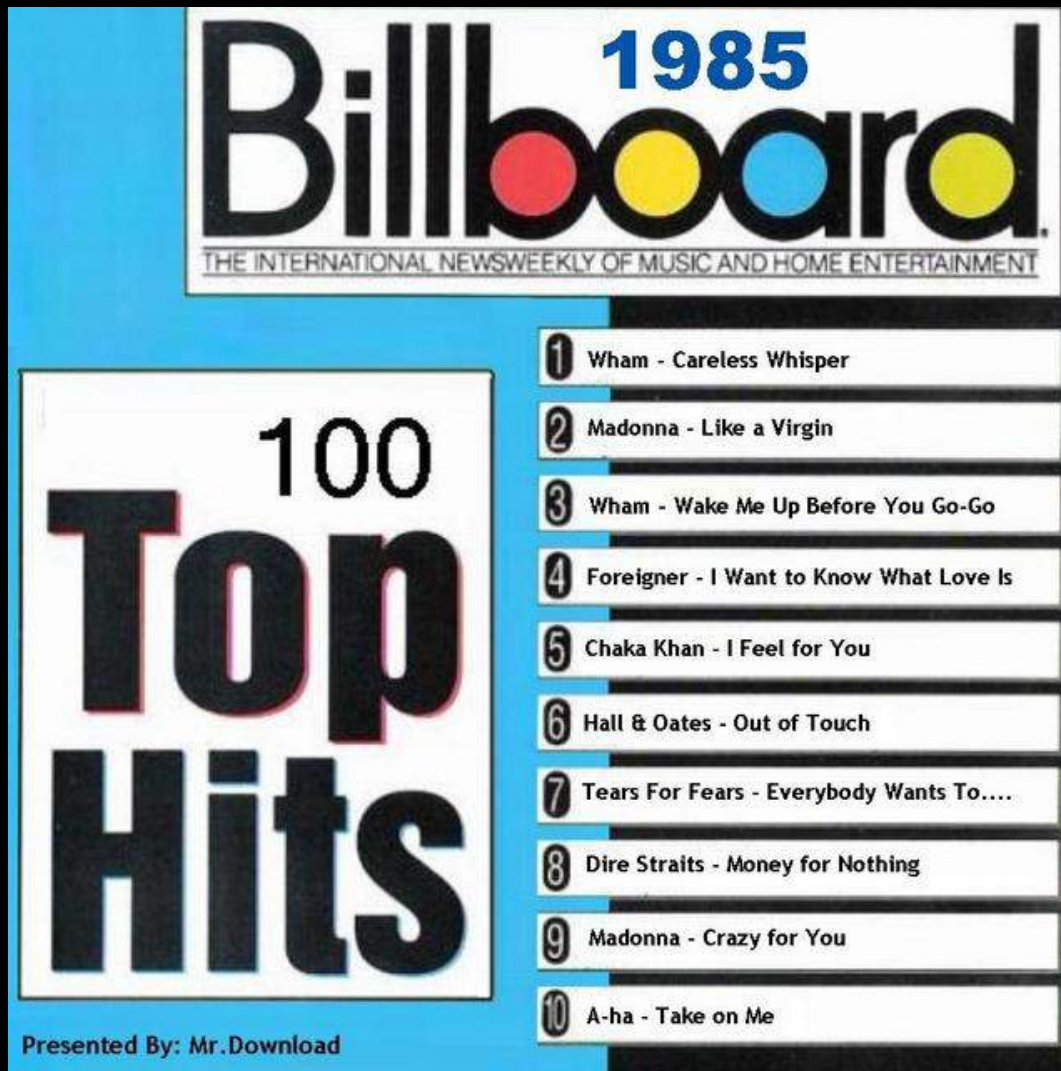
Source – “Tuning in to psychological change: Linguistic markers of psychological traits and emotions over time in popular U.S. song lyrics.” by Dr. DeWall

The Questions

Are our notions of historic cultural values reflective in popular music lyrics?

How can we visualize thematic trends in music lyrics?

Billboard Top 100



The graphic features the Billboard logo at the top with the year 1985. Below it, a box on the left contains the text '100 Top Hits'. To the right of this box is a list of the top 10 songs, each with a numbered circle and the song title and artist. The background is blue and white.

1985
Billboard
THE INTERNATIONAL NEWSWEEKLY OF MUSIC AND HOME ENTERTAINMENT

100 Top Hits

- 1 Wham - Careless Whisper
- 2 Madonna - Like a Virgin
- 3 Wham - Wake Me Up Before You Go-Go
- 4 Foreigner - I Want to Know What Love Is
- 5 Chaka Khan - I Feel for You
- 6 Hall & Oates - Out of Touch
- 7 Tears For Fears - Everybody Wants To....
- 8 Dire Straits - Money for Nothing
- 9 Madonna - Crazy for You
- 10 A-ha - Take on Me

Presented By: Mr.Download

The Billboard Charts

Since 1936 Billboard magazine has tracked the weekly popularity of songs in the US based on single sales, radio airplay and digital downloads.

Source - <http://www.billboard.com/charts/>

The Whitburn Project

Year	Yearly Rank	Source	Prefix	CH	40	10	PK	High	Ver	Artist	Inverted	Featured	Album	B-Side	Track
2011	407	h	2011-407	1	0	0	1	94		Lil Wayne	Lil Wayne		Tha Carter IV (Deluxe)		President Carter
2011	408	h	2011-408	1	0	0	1	95		Lil Wayne	Lil Wayne	Featuring	Tha Carter IV (Deluxe)		So Special
2011	409	h	2011-409	7	7	0	1	18		Kelly Clarkson	Clarkson, Kelly				Mr. Know It All
2011	410	h	2011-410	1	1	0	1	34		Lady Antebellum	Lady Antebellum		Own The Night		Wanted You More
2011	411	h	2011-411	2	0	0	1	58		Hugh Laurie	Laurie, Hugh		Let Them Talk (EP)		Police Dog Blues
2011	412	h	2011-412	1	0	0	1	84		Scotty McCreery	McCreery, Scotty		Clear As Day		The Trouble With Girls
2011	413	h	2011-413	1	0	0	1	87		JoJo	JoJo				Disaster
2011	414	h	2011-414	7	0	0	1	72		Band Perry, The	Band Perry, The		The Band Perry		All Your Life
2011	415	h	2011-415	7	0	0	1	77		Chris Brown	Brown, Chris	Featuring	F.A.M.E.		Wet The Bed
2011	416	h	2011-416	6	4	0	1	15		Coldplay	Coldplay		Mylo Xyloto		Paradise
2011	417	h	2011-417	5	0	0	2	84		Darius Rucker	Rucker, Darius		Charleston, SC 1		I Got Nothin'
2011	418	h	2011-418	1	0	0	1	87		Tony Bennett	Bennett & Amy Winehouse		Duets II		Body And Soul
2011	419	h	2011-419	6	0	0	1	78		David Nail	Nail, David		The Sound of a Man		Let It Rain
2011	420	h	2011-420	6	0	0	2	76		Ace Hood	Ace Hood	Featuring	Blood, Sweat & Tears		Body 2 Body
2011	421	h	2011-421	5	0	0	1	84		Sean Paul	Paul, Sean	Featuring			Got 2 Luv U
2011	422	h	2011-422	1	0	0	1	100		Brantley Gilbert	Gilbert, Brantley		Halfway To Heaven		You Don't Know Her Like I Do
2011	423	h	2011-423	5	5	4	1	2		Rihanna	Rihanna	Featuring	Talk That Talk		We Found Love
2011	424	h	2011-424	1	0	0	1	65		Glee Cast	Glee Cast				It's Not Unusual
2011	425	h	2011-425	1	0	0	1	67		Glee Cast	Glee Cast				You Can't Stop The Beat
2011	426	h	2011-426	1	0	0	1	68		Birdman	Birdman	Featuring			Y.U. Mad
2011	427	h	2011-427	1	0	0	1	69		Demi Lovato	Lovato, Demi		Unbroken		Fix A Heart
2011	428	h	2011-428	5	0	0	1	51		Jason Aldean	Aldean, Jason		My Kinda Party		Tattoos On This Town
2011	429	h	2011-429	1	0	0	1	83		Glee Cast	Glee Cast				We Got The Beat
2011	430	h	2011-430	5	0	0	1	68		Eric Church	Church, Eric		Chief		Drink In My Hand
2011	431	h	2011-431	1	0	0	1	98		Demi Lovato	Lovato, Demi		Unbroken		Unbroken
2011	432	h	2011-432	4	3	1	1	7		B.o.B.	B.o.B.	Featuring	Strange Clouds		Strange Clouds
2011	433	h	2011-433	4	2	0	1	28		Bruno Mars	Mars, Bruno		Twilight Saga: Breaking Dawn		It Will Rain
2011	434	h	2011-434	4	0	0	1	48		Nickelback	Nickelback		Here And Now		When We Stand Together
2011	435	h	2011-435	4	3	0	1	20		T-Pain	T-Pain	Featuring	Revolver		5 O'Clock
2011	436	h	2011-436	1	0	0	1	75		Glee Cast	Glee Cast				Somewhere
2011	437	h	2011-437	4	0	0	1	79		Lloyd	Lloyd	Featuring	King Of Hearts		Dedication To My Ex (Miss That)
2011	438	h	2011-438	1	0	0	1	83		Jason DeRulo	DeRulo, Jason		Future History		Fight For You
2011	439	h	2011-439	1	0	0	1	88		Blink-182	Blink-182		Neighborhoods (EP)		After Midnight
2011	440	h	2011-440	4	0	0	1	44		Luke Bryan	Bryan, Luke		Tailgates & Tanlines		I Don't Want This Night To End
2011	441	h	2011-441	4	0	0	1	57		Zac Brown Band	Brown, Zac, Band		You Get What You Give		Keep Me In Mind

The Data

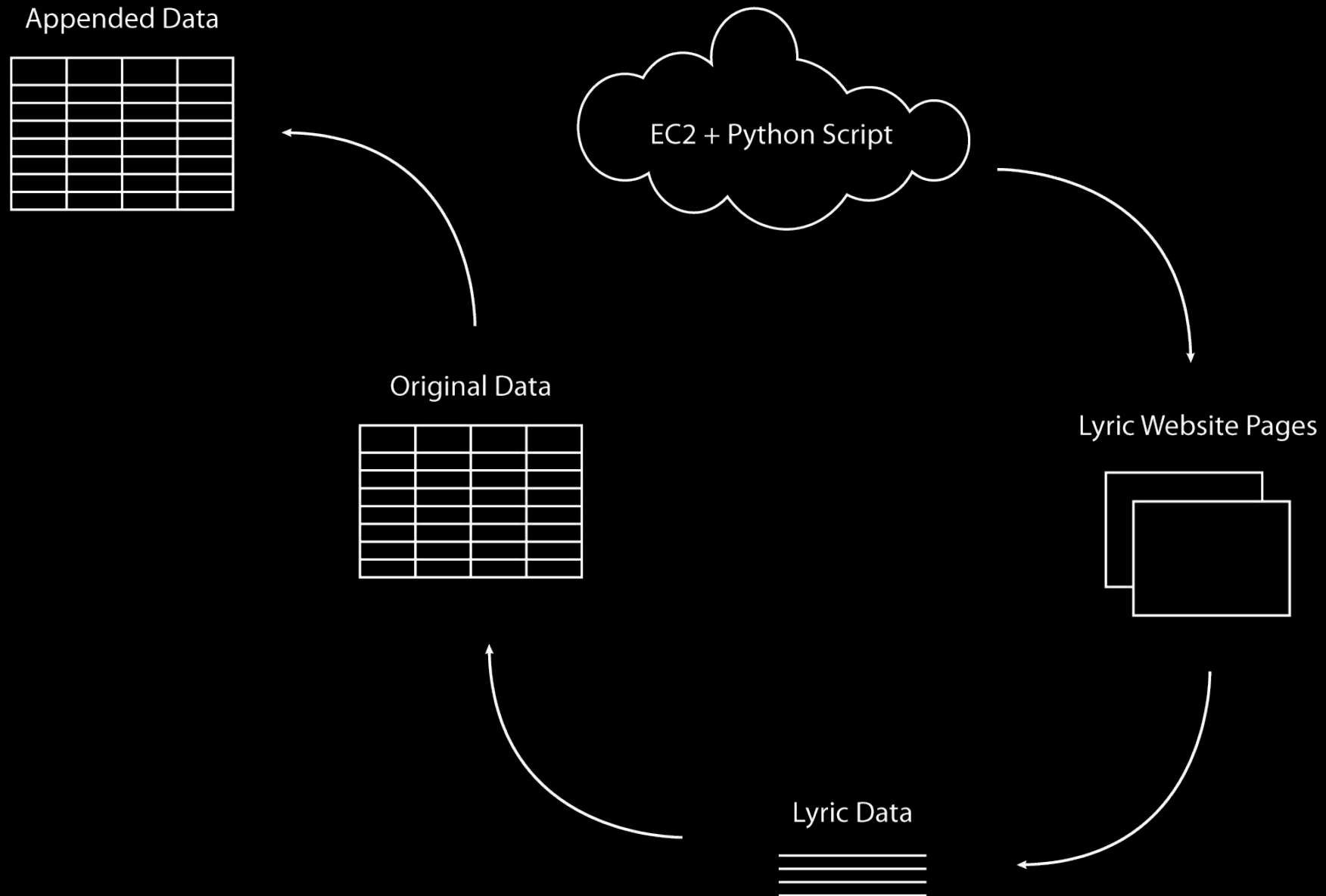
User curated Excel spreadsheet of 37,000 songs and 112 columns of raw data logging every Top 100 hit song from 1936 to today.

Source – Record Research and Billboard Magazine

Copyright

Redistribution of the data is in violation of Billboard and Record Research's copyright. However, the analysis of data falls under fair use.

Web Scrapping for Lyrics



Turning Text into Numbers

Qualitative vs. Quantitative Data

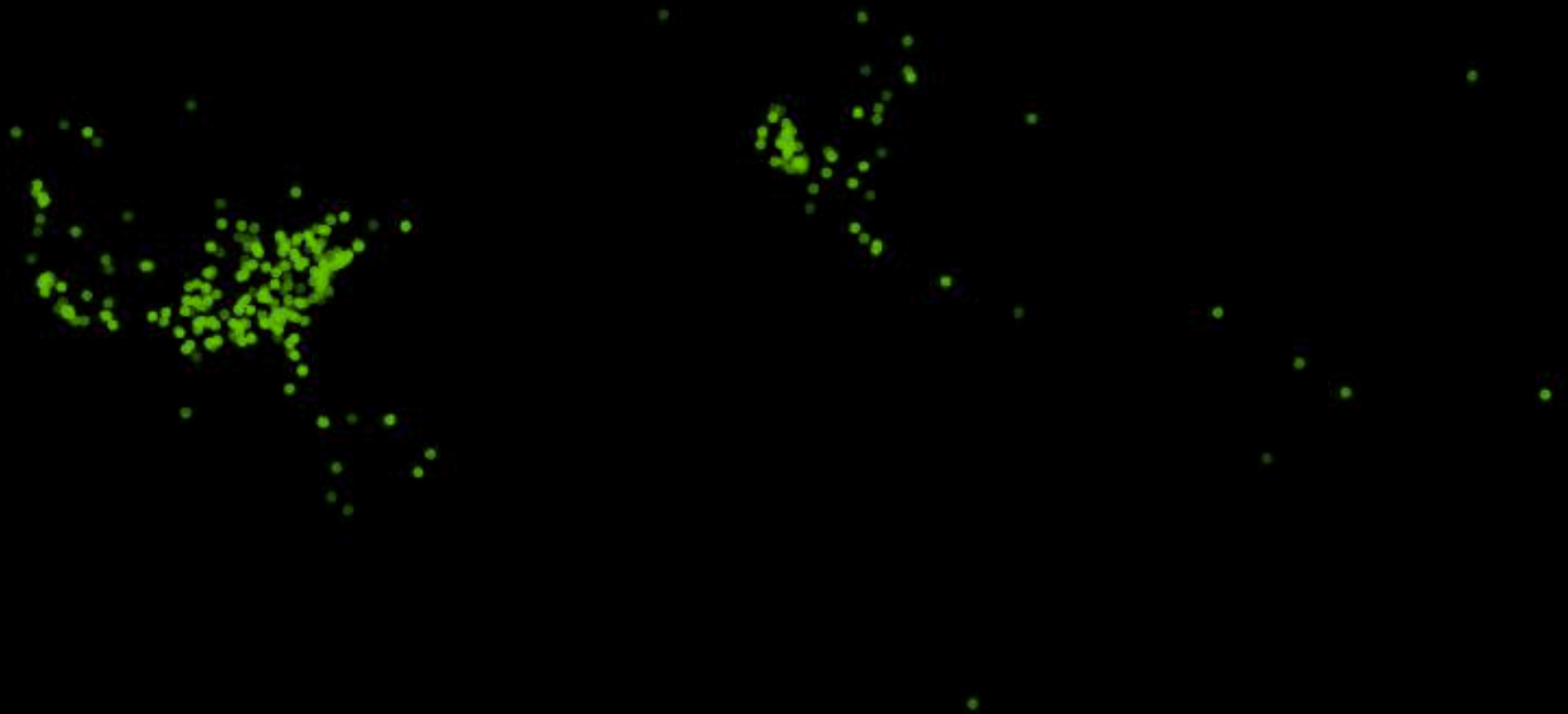
Transforming textual data into numeric points we can plot onto a visual representation. Such as, counting words or putting dots onto a map.

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Visualizing the Data, Part I

Location of artist and word frequency in lyrics.

Location of Artists, 1936 - 2010



Word Frequency, 1936 - 2010

YOU I THE TO AND A ME IT MY IN
THAT ON I'M YOUR OF LOVE BE ALL KNOW FOR
DON'T SO LIKE IS WE JUST DO BUT WITH IT'S OH
WHEN WHAT NO CAN UP BABY GOT THIS GET IF NOW YEAH GO
YOU'RE ONE OUT SEE SHE TIME WAS COME DOWN SAY CAN'T THEY
WANT CHORUS WAY MAKE LET NEVER HER HAVE GIRL WANNA BACK I'LL
HOW ARE AT RIGHT FROM GONNA TAKE TELL NEED AIN'T HE NOT WILL HERE
THERE FEEL NIGHT AS BEEN MORE ABOUT MAN HEART COULD AWAY I'VE THINK
LIFE DAY TOO WHERE GIVE GOOD THAT'S LITTLE KEEP WHY THEN WORLD SOME AGAIN
ONLY SAID AROUND THERE'S OR HEY BY THROUGH WELL STILL EVERY OVER ALWAYS HAD
CAUSE WHO REALLY GOTTA WON'T LOOK WOULD EVER OUR FIND YA MIND LONG US THINGS WERE BOY
'CAUSE SHE'S THEM MUCH PUT EYES HOLD STAY HIS CALL GONE BELIEVE BETTER HOME THING STOP TRY
OFF WE'RE OOH AN HEAR O THAN LEAVE NEW NOTHING VERSE EVEN EVERYTHING SHOW RUN AM TONIGHT
YOU'LL I'D HIM TURN AH ANOTHER LA LET'S INTO BEFORE SOMETHING UH SHOULD ALONE YOU'VE OLD PLEASE NA
NIGGA LEFT HARD REAL WITHOUT YO TWO MADE LAST WRONG MONEY NAME LIVE DANCE TRUE FACE GOING DID FOREVER
CRY THESE BIG CRAZY T OTHER PEOPLE WOMAN WALK MINE BAD INSIDE TALK SAME PLAY SHIT HEAD SWEET LIGHT BODY
WE'LL 2 SONG 'EM FEELING HE'S THOUGHT HAND END CHANGE ROCK USED TOGETHER HAS WHAT'S WHILE YES BREAK BEST
MAYBE ENOUGH DONE FIRST PLACE LOOKING MIGHT TOUCH ALRIGHT FALL SOMEONE ANYTHING WORK SOMEBODY LOST 1 SIDE REPEAT
L KNEW HIT STAND DREAMS SUN TOLD BRING TOWN HIGH FREE RIDE OWN DIDN'T THOSE FLY KISS C DREAM YOUNG HOT TILL PAIN
REMEMBER SMILE RUNNING MUST MYSELF GIRLS START EVERYBODY ROLL MISS LATE LONELY SHAKE FRIEND BECAUSE CARE CAME DAYS
FAR MOVE FOOL HELP HA WISH WAIT MANY FOUND DOOR GAME GUESS SURE SING FINE SOUL GOES SOMETIMES BLUE HANDS FRIENDS WAITING
TIMES THOUGH TRYING COMES D B READY WHOLE U WORDS HEARD YOURSELF UNTIL LOSE BLACK WATCH DA STRONG GOODBYE ANY MATTER COMING
ELSE M FIRE ITS WHOA GETTING NIGGAS NOBODY GOD YEA Y MEAN SKY ASS LINE LOVING MAY S MAKES PRETTY HOPE HAPPY CLOSE DAMN WENT
AFTER LIVING CHANCE FORGET FIGHT FLOOR MAMA THEIR RAIN BEHIND UNDERSTAND H LIE BITCH P TOOK EASY LISTEN COULDN'T SEEN ONCE LADY
MORNING TEARS FUCK OPEN KIND YEARS ARMS ROUND MUSIC IÂ™M LOT TODAY DEEP SEEMS SINCE PARTY NEXT HOUSE THEY'RE COOL ROAD WIT DIE WHO'S
BEAT THREE TOP FEELS E SLEEP HURT ASK HUH DOES BOTH CUZ BABE COLD 'BOUT STEP LAY WONDER CLUB G DARK BEAUTIFUL TIGHT HAIR EACH GAVE SUCH
SET K CAR BRIDGE Y'ALL FEET LOW HONEY HEAVEN TRIED N SHINE STREET KNOWS WANTED PART CITY WOULDN'T YOU'D DOING HELL WORD SLOW WIND CHECK BED HOOK
THROW UNDER RED WAKE LOVIN' STANDING HATE GETS FALLING WE'VE REASON WHITE BA SAW BOYS SOUND SOON VERY TOMORROW PHONE DADDY LIGHTS

Natural Language Processing

“The process of a computer extracting meaningful information from natural language input.”

Source – http://en.wikipedia.org/wiki/Natural_language_processing

Word Frequency, 1936 - 2010

LOVE KNOW LIKE JUST OH CAN
BABY GOT GET NOW YEAH GO ONE
SEE TIME YOU COME SAY WANT CHORUS
WAY MAKE LET NEVER ME WANNA GIRL
BACK RIGHT GONNA TAKE TELL NEED AIN'T
WILL I FEEL NIGHT MAN HEART AWAY THINK
LIFE DAY GIVE GOOD IT LITTLE KEEP WORLD
SAID AROUND HEY WELL STILL EVERY ALWAYS
CAUSE REALLY GOTTA LOOK EVER FIND YA MIND LONG
US THINGS BOY 'CAUSE MUCH PUT EYES HOLD STAY CALL
GONE BELIEVE BETTER HOME DO THING STOP TRY OOH HEAR
O ON LEAVE NEW EVEN NOTHING VERSE EVERYTHING
SHOW RUN TONIGHT NO TURN AH ANOTHER LA SOMETHING
UH ALONE OLD PLEASE NA UP NIGGA LEFT HARD REAL WITHOUT
YO MADE TWO LAST WRONG MONEY NAME LIVE DANCE TRUE FACE
A GOING FOREVER T CRY BIG CRAZY DOWN PEOPLE WOMAN WALK MINE

Word Frequency, 1950s

LOVE KNOW OH BABY YOU GO LIKE
WELL DOOBY HEART KISS ME WILL NOW
JUST OOBY TIME LITTLE ONE COME NEVER
ON BIMBO CAN SAY GOT CRAZY HONEY DREAM
DO SEE WAY TRUE DAY GONNA WANT HOLD TELL CHICAGO
QUEEN MUCH OLD BLUE EVERY A BACK MAYBE EVER GOOD
BABE RIGHT LIFE KIND NIGHT TAKE GET SEND STILL
THINGS E THRILL LOVING WAH PLEASE RAVE ALONE WRONG
PART NEW ALWAYS O GIRL TOWN PARADISE THINK BOY LOVED
MAKE MAN HILL DON'T YEAH WOMAN LEAVE HOME HEAR 'CAUSE
DARLING DREAMS BIG CRY AIN'T FELL LIPS CARE AROUND HEAVEN
WORLD AND SWEET HONEST SINCERE FOOL MINE SAID NEED WIN START
TOLD TEARS TWO EYES CANDY ARMS DOLL TAUGHT HAPPY BLUEBERRY
BUTTERFLY ANNA MARIE TEENAGE SUN REMEMBER MIND AGAIN DONE
YOUNG HARD HEAD FORGIVE NAME MAKES CRIED CAME SIDE CALL DOOR
FEEL LONELY DIANA CHORUS SHARE WITHOUT LIVE MOON NEAR DARLIN'
WALKING THOUGH LOOK SOMEONE FACE SAW BLOSSOM BE STAY MORE SHEP GONE
LONG FOUND I CAUSE HEADED SINCE BEGAN STUNG UH BILLY PRETTY NEXT
STORE RIVER BLUES LEFT GIVE SONG SHINE FOREVER RAIN YES SOON FIND FUN
MADE MEAN ADAPT SING CROW STREET CARES CHAME THOUGHT EVERYTHING

Word Frequency, 1950s

LOVE KNOW OH BABY YOU GO LIKE
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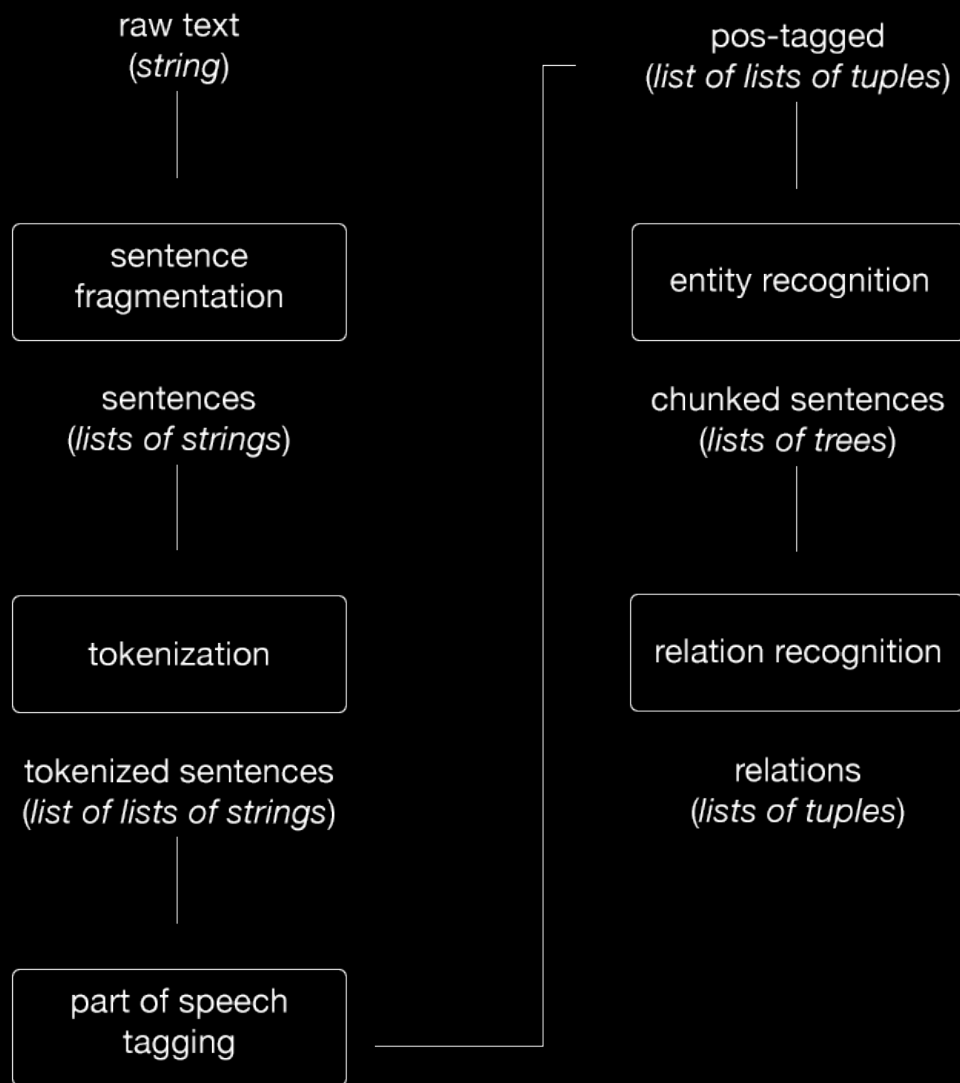
Word Frequency, 1970s

LOVE KNOW OH JUST CAN GOT
BABY LIKE TIME YEAH NOW COME YOU
GO GET WAY SEE SAY FEEL LET GOOD MAN
MAKE ME RIGHT ONE LIFE AWAY WELL WANT
NEVER DO GONNA DAY AIN'T TELL NIGHT NEED
WILL LITTLE KEEP RUNNING ALWAYS BACK LONG
MIND HEY SONG AH TAKE THINK REALLY OLD HEART
EVER WORLD HOME CALL PEOPLE US GIVE STAY SWEET
SAID 'CAUSE EVERY ON OOH THING BELIEVE AROUND
PLAY WANNA EYES PLEASE NO PUT WITHOUT NAME LIGHT STILL
BOOGIE BOY HEAR WOMAN GONE NA FIND THINGS BETTER RUN IT
HONEY HIGH MUCH CRY SOMETHING WHOA LA MUSIC FACE FRIEND
BODY TRY TURN LEAVE DAYS LOOK FREE NOTHING GIRL FEELING
MONEY INSIDE SING HARD LAST CHORUS MINE SUN SHOW LIVE FIRST
MY USED GOING ANOTHER FA HAND MACHO SAD YES MADE SMILE SURE
DANCE TOGETHER GOODBYE CAME BLAME NEW LONELY KNEW BEST POWER
DREAMS GOTTA FEELS MAMA STOP REAL RIDE MAKES MAY EVEN TWO PUNK
MORNING AGAIN BLUE CRAZY MR FAME UNDERSTAND HAPPY I LOOKING GOIN'

Word Frequency, 1970s

LOVE KNOW OH JUST CAN GOT
BABY LIKE TIME YEAH NOW COME YOU
GO GET WAY SEE SAY FEEL LET GOOD MAN
MAKE ME RIGHT ONE LIFE AWAY WELL WANT
NEVER DO GONNA DAY **AIN'T** TELL NIGHT NEED
WILL LITTLE KEEP RUNNING ALWAYS BACK LONG
MIND HEY SONG AH TAKE THINK REALLY OLD HEART
EVER WORLD HOME CALL PEOPLE US GIVE STAY SWEET
SAID 'CAUSE EVERY ON OOH THING BELIEVE AROUND
PLAY WANNA EYES PLEASE NO PUT WITHOUT NAME LIGHT STILL
BOOGIE BOY HEAR WOMAN GONE NA FIND THINGS BETTER RUN IT
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BODY TRY TURN LEAVE DAYS LOOK FREE NOTHING GIRL FEELING
MONEY INSIDE SING HARD LAST CHORUS MINE SUN SHOW LIVE FIRST
MY USED GOING ANOTHER FA HAND **MACHO** SAD YES MADE SMILE SURE
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MORNING AGAIN BLUE CRAZY MR FAME UNDERSTAND HAPPY I LOOKING GOIN'

Named Entity and Relationship Extraction



Chunking a sentence into parts of speech. Finding the noun phrases and semantic linkages between them.

Source – O'Reilly "Natural Language Processing with Python"

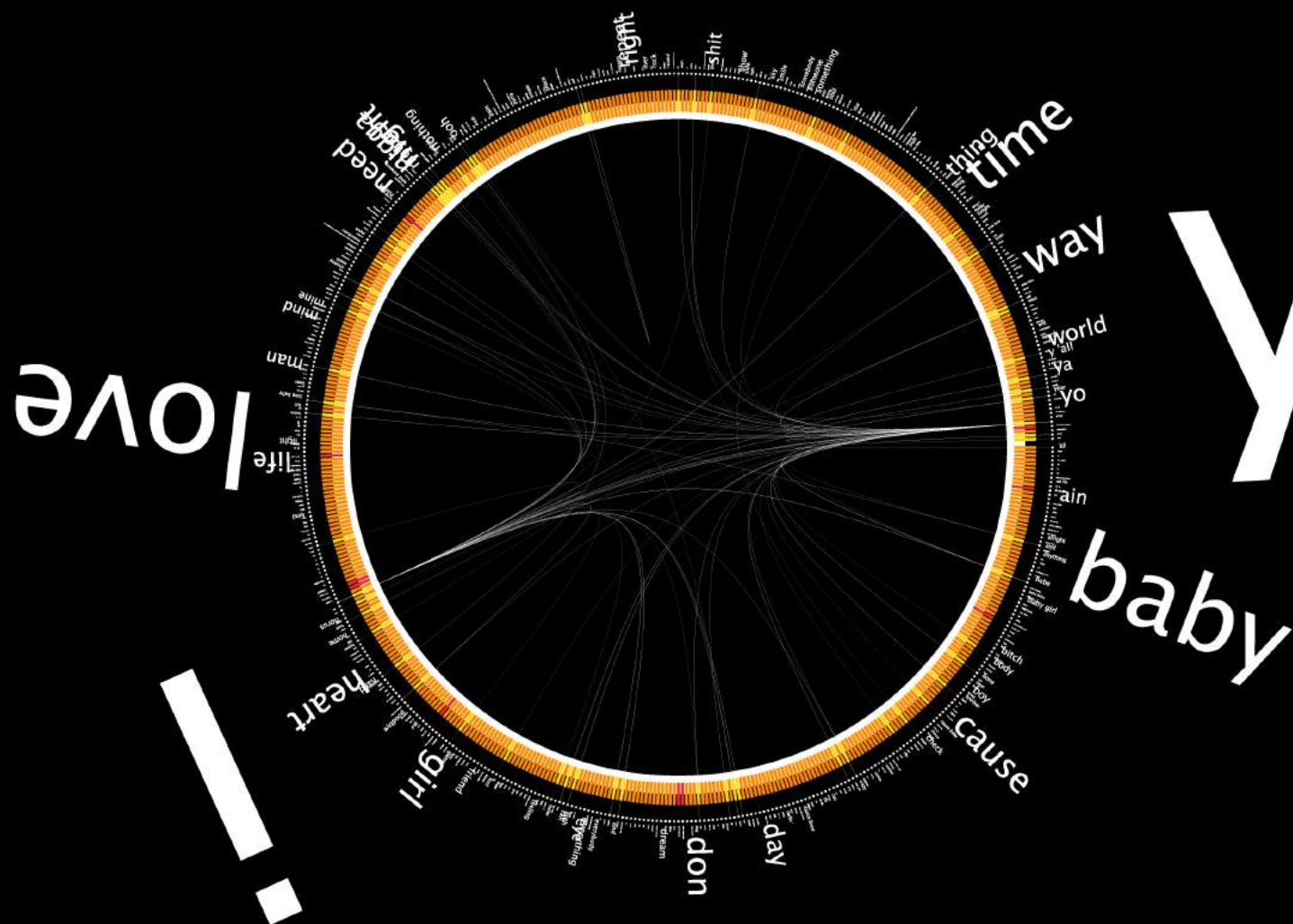
Visualizing the Data, Part II

N-grams, named entities, and relationships.

2000 – 2009

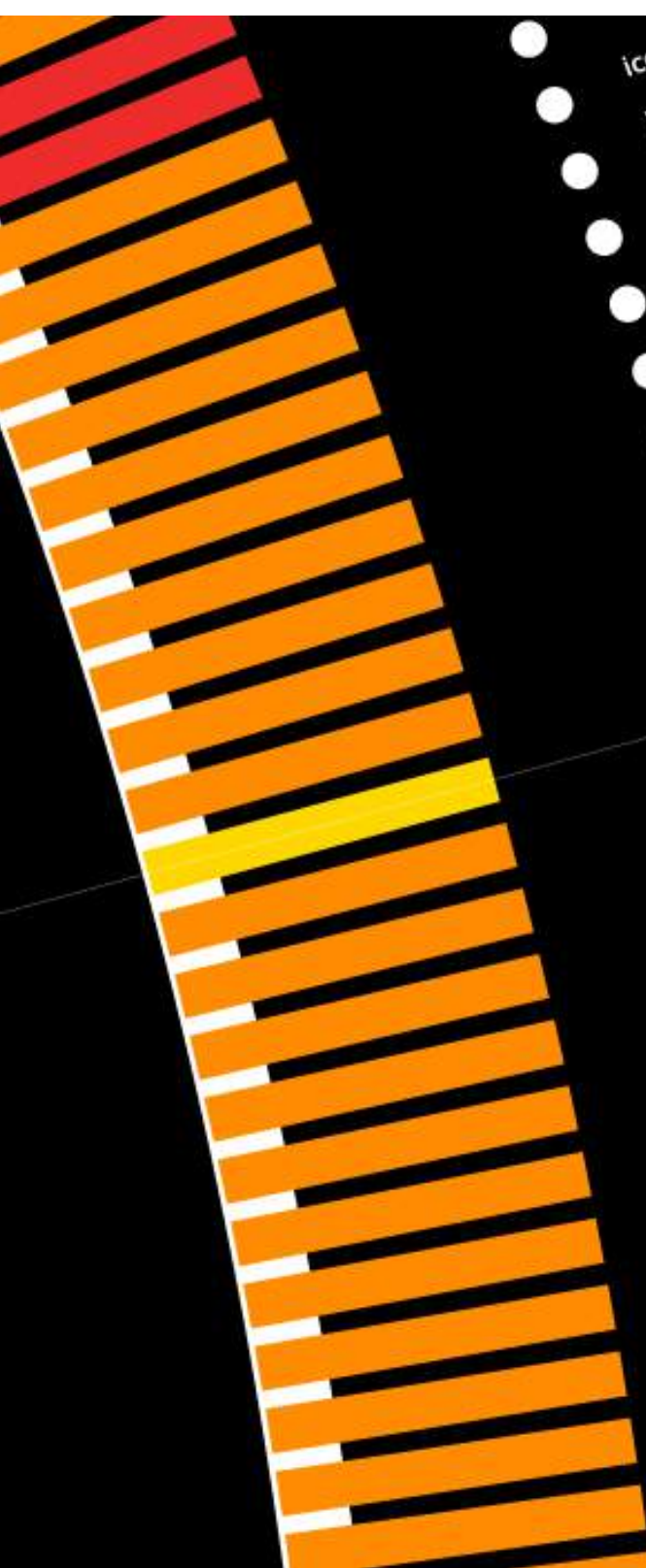
2000 – 2009

1990 - 1999



you

baby



- ice
- ice cube
- if
- im
- in
- isn
- it
- jam
- jay-z
- jesus
- jiggy wit
- jimmy dean
- joy
- joy joy joy
- keith
- kid
- killer
- kind**
- kiss
- kissin '
- knee**
- krazy bone



1980 - 1989

• love someone

• love ya

• lover

• lover lover loverboy

• luck

• ma

• magic

• man

• man ain

• man baby

• material world

• matter

• mess

• message

• minute

• mind

• mine

• minute

• miracle

• mistake

• mister sandman

• moment

• money

• monkey

• moon

• morning light

• mother

• move

• music

• n y

• na na na

Lyrical Themes in History

What do the visualizations tell us?

Next Steps

Lyrical themes by genre and location.

Sentiment analysis.

Interactive applications.

Sociolinguistics and academic analysis of cultural trends.

Thank you.