

Avril Lavigne music evolution

March 5, 2020

1 Letting go of early 2000's Avril Lavigne

This is me (hey! I'm Éléonore Mayola) coming to you with a crucial investigation into what happened to Avril Lavigne in the early 2000's.

This announcement might surprise you if, unlike me, you haven't wandered down the comments under one of her early YouTube video. That's where I discovered a specific group of Lavigne fans are convinced she passed away in 2003 and was replaced by a lookalike [1,2].

It is a fact that Avril Lavigne changed in both her music and style, but who doesn't change over time. The explanation being that transformation is very unlikely to be so dramatic, but then what happened? While it is tricky to account for her personal /internal evolution, some of her musical influences (such as her support band and producing partners) can be looked at to find a correlation with her visible transformation (music and style).

[6]

Avril Lavigne's albums popularity decreased especially after the 3rd album. This third album seems different musically (tempo, energy, speechiness) and has songs viewed as part of a style called "Bubblegum Pop". It was made after she left Arista Records, and after the biggest musicians turnover in her backing band. While her style (hair, clothes) started to change between the two first albums (released in 2002 and 2004), which is consistent with her leaving teenagehood, her biggest musical change happened on the third album (2007). This change in both style and music has lost her a part of her fans. And it could obviously not be explained by the artist being replaced in 2003.

```
[1]: import pandas as pd
import altair as alt
alt.renderers.enable('notebook')
```

```
[1]: RendererRegistry.enable('notebook')
```

1.1 Avril Lavigne studio albums data

[3, 4]

```
[2]: al_albums = [
    {"name": "Let Go", "year": 2002, "genre": ["Alternative rock", "Pop punk"],
     ↪ "global_sales": 16000000,
```

```

        "billboard200_debut": 2, "label": ["Arista Records"],
        "producers": ["L.A. Reid", "The Matrix", "Clif Magness", "Curt Frasca",
        ↪ "Peter Zizzo"]},
        {"name": "Under My Skin", "year": 2004, "genre": ["Alternative rock", "Pop
        ↪ punk"], "global_sales": 10000000,
        "billboard200_debut": 1, "label": ["Arista Records", "RCA Records"],
        "producers": ["Raine Maida", "Don Gilmore", "Butch Walker"]},
        {"name": "The Best Damn Thing", "year": 2007, "genre": ["Bubblemum
        ↪ pop", "Pop punk"], "global_sales": 6000000,
        "billboard200_debut": 1, "label": ["RCA Records"],
        "producers": ["Avril Lavigne", "Deryck Whibley", "Butch Walker", "Rob
        ↪ Cavallo", "Dr. Luke",
        "The Submarines", "Jesse Welch", "Steven Wolf"]},
        {"name": "Goodbye Lullaby", "year": 2011, "genre": ["Pop rock"],
        ↪ "global_sales": 2000000,
        "billboard200_debut": 4, "label": ["RCA Records"],
        "producers": ["Avril Lavigne", "Deryck Whibley", "Butch Walker", "Max
        ↪ Martin", "Shellback"]},
        {"name": "Avril Lavigne", "year": 2013, "genre": ["Pop", "Pop rock"],
        ↪ "global_sales": 650000,
        "billboard200_debut": 5, "label": ["Epic Records"],
        "producers": ["Avril Lavigne", "L.A. Reid", "Martin Johnson", "Peter
        ↪ Svensson",
        "David Hodges", "Matt Squire", "Chad Kroeger"]},
        {"name": "Head Above Water", "year": 2019, "genre": ["Pop rock"],
        ↪ "global_sales": None,
        "billboard200_debut": 13, "label": ["BMG"],
        "producers": ["Avril Lavigne", "Stephan Moccio", "Chris Baseford", "Johan
        ↪ Carlsson",
        "Lauren Christy", "Ryan Cabrera", "Chad Kroeger"]}
    ]

```

```
[3]: df_albums = pd.DataFrame(al_albums)
```

```
[4]: df_albums
```

```
[4]:
```

	name	year	genre	global_sales	\
0	Let Go	2002	[Alternative rock, Pop punk]	16000000.0	
1	Under My Skin	2004	[Alternative rock, Pop punk]	10000000.0	
2	The Best Damn Thing	2007	[Bubblemum pop, Pop punk]	6000000.0	
3	Goodbye Lullaby	2011	[Pop rock]	2000000.0	
4	Avril Lavigne	2013	[Pop, Pop rock]	650000.0	
5	Head Above Water	2019	[Pop rock]	NaN	
	billboard200_debut		label		\
0	2		[Arista Records]		

```

1          1 [Arista Records, RCA Records]
2          1 [RCA Records]
3          4 [RCA Records]
4          5 [Epic Records]
5          13 [BMG]

```

```

                                producers
0 [L.A. Reid, The Matrix, Clif Magness, Curt Fra...
1 [Raine Maida, Don Gilmore, Butch Walker]
2 [Avril Lavigne, Deryck Whibley, Butch Walker, ...
3 [Avril Lavigne, Deryck Whibley, Butch Walker, ...
4 [Avril Lavigne, L.A. Reid, Martin Johnson, Pet...
5 [Avril Lavigne, Stephan Moccio, Chris Baseford...

```

```
[6]: df_albums.to_csv("al_albums_data.csv")
```

1.1.1 Albums sales and debut in US charts

```
[6]: chart1 = alt.Chart(df_albums, width=300, height=200).mark_point(size=100,
    ↪filled=True, opacity=1).encode(
    alt.X('year',
        scale=alt.Scale(domain=(1999, 2019))
    ),
    y='global_sales:Q',
    color=alt.Color('name', sort=['year'])
)

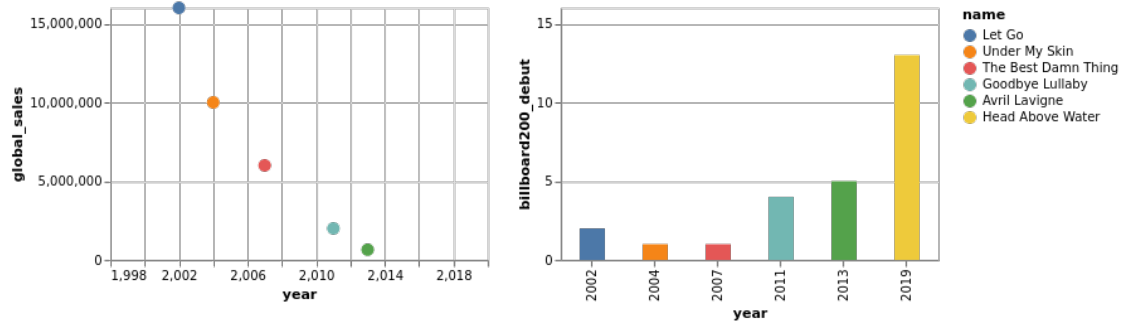
chart2 = alt.Chart(df_albums, width=300, height=200).mark_bar(size=20).encode(
    x='year:O',
    y=alt.Y('billboard200_debut:Q',
        scale=alt.Scale(domain=(0, 15))),
    color=alt.Color('name', sort=['year'])
)

chart1 | chart2

```

```
<vega.vegalite.VegaLite at 0x7fe0e2056a58>
```

```
[6]:
```



=> A.L. studio albums global sales decreased with time

=> A.L. studio albums US chart debut worsened with time

```
[7]: albums_selection = df_albums[["year", "label", "producers"]]

pd.set_option('max_colwidth', 120)

albums_selection
```

```
[7]:   year          label \
0  2002      [Arista Records]
1  2004  [Arista Records, RCA Records]
2  2007      [RCA Records]
3  2011      [RCA Records]
4  2013      [Epic Records]
5  2019      [BMG]

      producers
0          [L.A. Reid, The Matrix, Clif
Magness, Curt Frasca, Peter Zizzo]
1          [Raine
Maida, Don Gilmore, Butch Walker]
2  [Avril Lavigne, Deryck Whibley, Butch Walker, Rob Cavallo, Dr. Luke, The
Submarines, Jesse Welch, Steven Wolf]
3          [Avril Lavigne, Deryck Whibley,
Butch Walker, Max Martin, Shellback]
4  [Avril Lavigne, L.A. Reid, Martin Johnson, Peter Svensson, David
Hodges, Matt Squire, Chad Kroeger]
5  [Avril Lavigne, Stephan Moccio, Chris Baseford, Johan Carlsson, Lauren
Christy, Ryan Cabrera, Chad Kroeger]
```

=> Frequent change of producers, changed labels several time

1.2 Avril Lavigne's backing band

[3]

- 2nd album (2004): 1 new musician (since the previous album)
- 3rd album (2007): 6 new musicians
- 4th album (2011): 1 new musician
- 5th album (2013): 2 new musicians
- 6th album (2019): 2 new musicians

=> There is no one left from the original band, they stayed for the first or two first albums

The 3rd album has the most new band members.

1.3 Avril Lavigne's songs

[5]

```
[33]: al_songs = pd.read_csv('al_songs_spotify_data.csv')
```

```
[34]: al_songs.head()
```

```
[34]:
```

	title	artist	top genre	year	added	\
0	Complicated	Avril Lavigne	canadian pop	2002	2020-03-05	
1	Sk8er Boi	Avril Lavigne	canadian pop	2002	2020-03-05	
2	What the Hell	Avril Lavigne	canadian pop	2011	2020-03-05	
3	Girlfriend	Avril Lavigne	canadian pop	2007	2020-03-05	
4	Head Above Water	Avril Lavigne	canadian pop	2019	2020-03-05	

	Beats per minute	energy	danceability	Loudness (dB)	liveness	valence	\
0	78	78	59	-6	30	43	
1	150	90	49	-4	36	48	
2	150	93	58	-4	14	88	
3	164	96	56	-2	21	67	
4	130	69	58	-5	10	27	

	duration	acousticness	speechiness	popularity
0	245	6	5	76
1	204	0	5	74
2	221	0	5	73
3	217	0	10	72
4	221	1	7	71

```
[35]: # Add an 'album' column
albums_content = {
```

```

    "album1": {"name": "Let Go",
               "songs": ["Losing Grip", "Complicated", "Sk8er Boi", "I'm with_
↳You", "Mobile", "Unwanted",
                        "Tomorrow", "Anything but Ordinary", "Things I'll_
↳Never Say", "My World",
                        "Nobody's Fool", "Too Much to Ask", "Naked"]},
    "album2": {"name": "Under My Skin",
               "songs": ["Take Me Away", "Together", "Don't Tell Me", "He_
↳Wasn't",
                        "How Does It Feel", "My Happy Ending", "Nobody's_
↳Home", "Forgotten",
                        "Who Knows", "Fall to Pieces", "Freak Out", "Slipped_
↳Away"]},
    "album3": {"name": "The Best Damn Thing",
               "songs": ["Girlfriend", "I Can Do Better", "Runaway", "The Best_
↳Damn Thing",
                        "When You're Gone", "Everything Back but You", "Hot",_
↳"Innocence",
                        "I Don't Have to Try", "One of Those Girls",_
↳"Contagious", "Keep Holding On"]},
    "album4": {"name": "Goodbye Lullaby",
               "songs": ["Black Star", "What the Hell", "Push", "Wish You Were_
↳Here", "Smile",
                        "Stop Standing There", "I Love You", "Everybody_
↳Hurts", "Not Enough",
                        "4 Real", "Darlin", "Remember When", "Goodbye",_
↳"Alice"]},
    "album5": {"name": "Avril Lavigne",
               "songs": ["Rock n Roll", "Here's to Never Growing Up", "17",_
↳"Bitchin' Summer",
                        "Let Me Go", "Give You What You Like", "Bad Girl",_
↳"Hello Kitty",
                        "You Ain't Seen Nothin' Yet", "Sippin' On Sunshine",_
↳"Hello Heartache",
                        "Falling Fast", "Hush Hush"]},
    "album6": {"name": "Head Above Water",
               "songs": ["Head Above Water", "Birdie", "I Fell in Love with the_
↳Devil",
                        "Tell Me It's Over", "Mailbox", "Dumb Blonde", "It Was_
↳In Me",
                        "Souvenir", "Crush", "Goddess", "Bigger Wow", "Love Me_
↳Insane", "Warrior"]}
}

```

```
[36]: import string
```

```
def clean_song_title(song_title):
    song_title = song_title.lower()
    song_title = song_title.split(" - ")[0]
    song_title = song_title.split(" (")[0]
    return song_title
```

```
[37]: for k, v in albums_content.items():
        v["songs"] = [clean_song_title(song) for song in v["songs"]]
```

```
[38]: def get_album_names(title):
        title = clean_song_title(title)
        if title in albums_content["album1"]["songs"]:
            return albums_content["album1"]["name"]
        if title in albums_content["album2"]["songs"]:
            return albums_content["album2"]["name"]
        if title in albums_content["album3"]["songs"]:
            return albums_content["album3"]["name"]
        if title in albums_content["album4"]["songs"]:
            return albums_content["album4"]["name"]
        if title in albums_content["album5"]["songs"]:
            return albums_content["album5"]["name"]
        if title in albums_content["album6"]["songs"]:
            return albums_content["album6"]["name"]
```

```
[39]: # Add empty 'album' album
        al_songs.assign(album="")
```

```
[39]:
```

	title	artist	top genre	year	added	\
0	Complicated	Avril Lavigne	canadian pop	2002	2020-03-05	
1	Sk8er Boi	Avril Lavigne	canadian pop	2002	2020-03-05	
2	What the Hell	Avril Lavigne	canadian pop	2011	2020-03-05	
3	Girlfriend	Avril Lavigne	canadian pop	2007	2020-03-05	
4	Head Above Water	Avril Lavigne	canadian pop	2019	2020-03-05	
..	
70	Black Star	Avril Lavigne	canadian pop	2011	2020-03-05	
71	4 Real	Avril Lavigne	canadian pop	2011	2020-03-05	
72	Sippin' On Sunshine	Avril Lavigne	canadian pop	2013	2020-03-05	
73	Goodbye	Avril Lavigne	canadian pop	2011	2020-03-05	
74	You Ain't Seen Nothin' Yet	Avril Lavigne	canadian pop	2013	2020-03-05	

	Beats per minute	energy	danceability	Loudness (dB)	liveness	valence	\
0	78	78	59	-6	30	43	
1	150	90	49	-4	36	48	
2	150	93	58	-4	14	88	
3	164	96	56	-2	21	67	

4	130	69	58	-5	10	27
..
70	128	33	54	-9	19	20
71	78	84	52	-6	11	28
72	176	73	55	-7	32	56
73	167	33	18	-7	13	24
74	145	90	56	-4	7	67

	duration	acousticness	speechiness	popularity	album
0	245	6	5	76	
1	204	0	5	74	
2	221	0	5	73	
3	217	0	10	72	
4	221	1	7	71	
..
70	94	61	3	41	
71	208	0	3	41	
72	209	0	12	41	
73	272	72	3	40	
74	193	0	6	40	

[75 rows x 16 columns]

```
[40]: for idx, row in al_songs.iterrows():
        album_name = get_album_names(row.title)
        al_songs.loc[idx, "album"] = album_name
```

```
[41]: al_songs.head()
```

```
[41]:
```

	title	artist	top genre	year	added	\
0	Complicated	Avril Lavigne	canadian pop	2002	2020-03-05	
1	Sk8er Boi	Avril Lavigne	canadian pop	2002	2020-03-05	
2	What the Hell	Avril Lavigne	canadian pop	2011	2020-03-05	
3	Girlfriend	Avril Lavigne	canadian pop	2007	2020-03-05	
4	Head Above Water	Avril Lavigne	canadian pop	2019	2020-03-05	

	Beats per minute	energy	danceability	Loudness (dB)	liveness	valence	\
0	78	78	59	-6	30	43	
1	150	90	49	-4	36	48	
2	150	93	58	-4	14	88	
3	164	96	56	-2	21	67	
4	130	69	58	-5	10	27	

	duration	acousticness	speechiness	popularity	album
0	245	6	5	76	Let Go
1	204	0	5	74	Let Go
2	221	0	5	73	Goodbye Lullaby

3	217	0	10	72	The Best Damn Thing
4	221	1	7	71	Head Above Water

```
[42]: al_songs.to_csv('al_songs_spotify_data_with_albums.csv', index=False)
```

```
[44]: # Tempo (BPM)
chart3 = alt.Chart(al_songs, width=200, height=200).mark_boxplot(opacity=0.7).
    ↪encode(
        x='year:O',
        y='Beats per minute:Q',
        color=alt.Color('album', sort=['year']),
        tooltip=['title', 'Beats per minute']
    ).interactive()

# Energy
chart4 = alt.Chart(al_songs, width=200, height=200).mark_boxplot(opacity=0.7).
    ↪encode(
        x='year:O',
        y='energy:Q',
        color=alt.Color('album', sort=['year']),
        tooltip=['title', 'energy']
    ).interactive()

# Danceability
chart5 = alt.Chart(al_songs, width=200, height=200).mark_boxplot(opacity=0.7).
    ↪encode(
        x='year:O',
        y='danceability:Q',
        color=alt.Color('album', sort=['year']),
        tooltip=['title', 'danceability']
    ).interactive()

# Positive Mood (Valence)
chart6 = alt.Chart(al_songs, width=300, height=300).mark_boxplot(opacity=0.7).
    ↪encode(
        x='year:O',
        y='valence:Q',
        color=alt.Color('album', sort=['year']),
        tooltip=['title', 'valence']
    ).interactive()

# Acousticness
chart7 = alt.Chart(al_songs, width=300, height=300).mark_boxplot(opacity=0.7).
    ↪encode(
        x='year:O',
        y='acousticness:Q',
        color=alt.Color('album', sort=['year']),
```

```

        tooltip=['title', 'acousticness']
    ).interactive()

# Speechiness
chart8 = alt.Chart(al_songs, width=300, height=300).mark_boxplot(opacity=0.7).
    ↪encode(
        x='year:O',
        y='speechiness:Q',
        color=alt.Color('album', sort=['year']),
        tooltip=['title', 'speechiness']
    ).interactive()

# Popularity
chart9 = alt.Chart(al_songs, width=300, height=300).mark_boxplot(opacity=0.7).
    ↪encode(
        x='year:O',
        y='popularity:Q',
        color=alt.Color('album', sort=['year']),
        tooltip=['title', 'popularity']
    ).interactive()

```

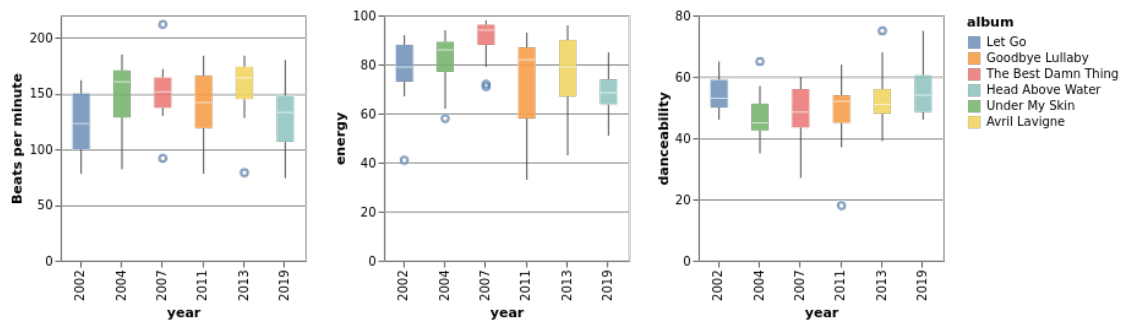
```

[45]: # Tempo (BPM) | Energy | Danceability
      chart3 | chart4 | chart5

```

<vega.vegalite.VegaLite at 0x7f994c0b6160>

[45]:

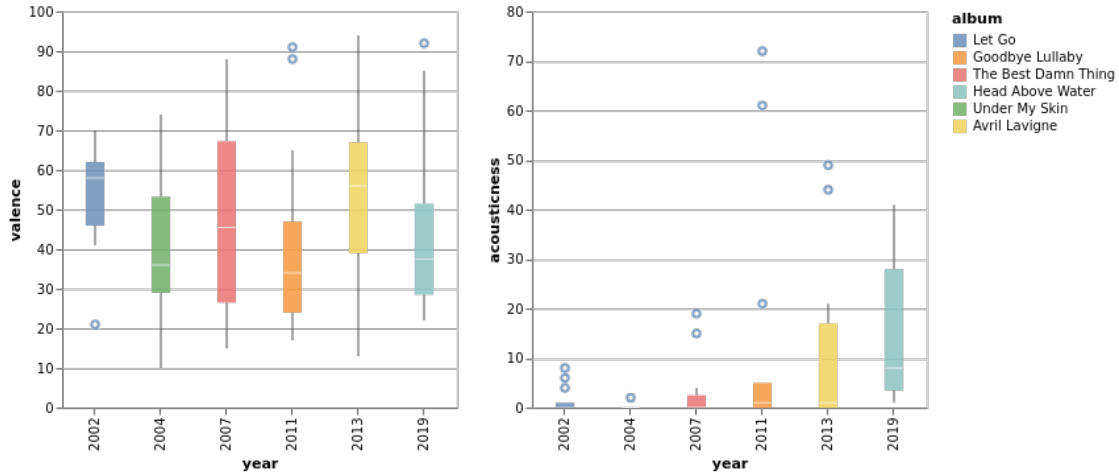


```

[46]: # Positive Mood (Valence) | # Acousticness
      chart6 | chart7

```

<vega.vegalite.VegaLite at 0x7f994c0b6dd8>

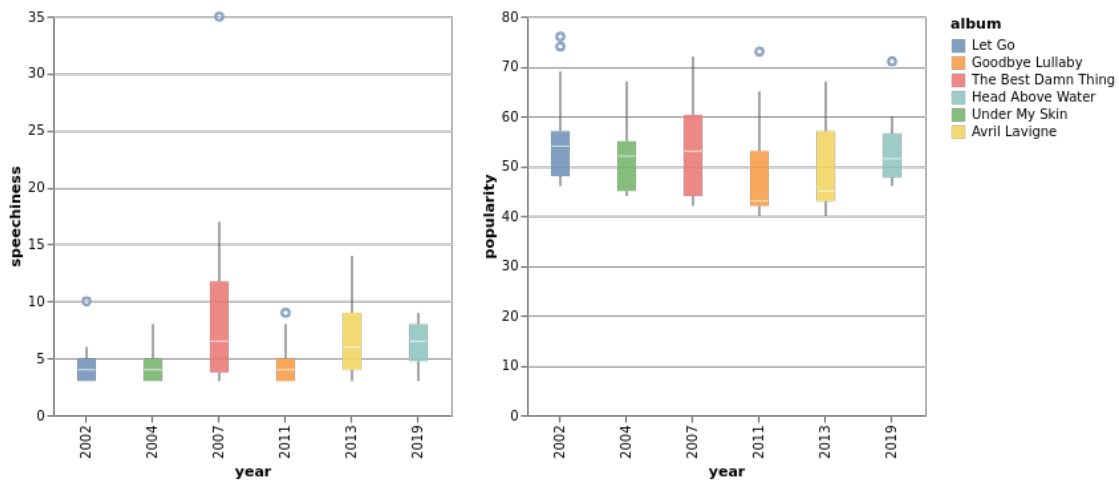


[46] :

```
[47]: # Speechiness / Popularity
      chart8 | chart9
```

<vega.vegalite.VegaLite at 0x7f994c058b00>

[47] :



=> Musically, songs from the 3rd record seem more upbeat (as reflected by their BPM and energy) and have more lyrics. Songs on the 4th album are more acoustic.

Using songs from an open Spotify playlist [5] shows the 1st and 2nd album are more similar (energy, acousticness, speechiness and popularity) and the 1st and fourth album are also quite close (BPM, danceability and speechiness). It'd be interesting to try this analysis on songs from the 2 last studio albums.

References

Conspiracy * [1] <https://www.theguardian.com/lifeandstyle/shortcuts/2017/may/15/avril-lavigne-melissa-cloning-conspiracy-theories> * [2] <https://avrilestamorta.blogspot.com/>

Data for analysis * [3] https://en.wikipedia.org/wiki/Avril_Lavigne * [4] https://en.wikipedia.org/wiki/Avril_Lavigne_discography * [5] open Spotify playlist with all songs from studio recorded albums: <https://open.spotify.com/playlist/1cVKLVWEFN2Be7tTA13qUj> analyzed using <http://organizeyourmusic.playlistmachinery.com> (Powered by Spotify. Created by @plamere at The Science of Mu)

Other * [6] photos: <https://avrillavigne.com/music/> * MTV docu, 2007: <https://www.youtube.com/watch?v=f8GLE10jLSw>

[]: