DL838 BA (Hons) Creative Music Production

Professional Project - Year 4

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To What Extent Can a Set of Guidelines be Compiled That Would Have Aided the Process of Writing Commercially Successful Pop Hits in 2014 and 2015

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Abstract

This project aimed to compile a set of guidelines that, if followed, could have aided the writing of a commercially successful pop song in the years 2014 and 2015. Twelve commercially successful songs that were released in that time period were chosen for this study. Research was carried out in areas such as the impact has on the human brain and body, compositional tricks used to engage listeners and the English language. Findings from this research were used to compile a list of topics to be analysed in the chosen songs. Some of these topics included chord progressions, lyrics, vocal melody shapes, vocal singing ranges and production/arrangement. The process of this project resulted in a set of guidelines being created that is useful and accessible to anyone interested in the field of study or the practice of popular songwriting. This project, along with other projects in this field of study, could be used to forecast trends in the popular songwriting practice which could in turn be lucrative information for any pop songwriter.

Introduction

This project looks at the craft of writing popular music. The project's aim was to study twelve of the most successful pop songs released during the years 2014 and 2015 to find out what traits they share, if any. Using the findings, the project in question compiled a list of guidelines that if followed could aid in the writing of a commercially successful song. A pop song was then composed while strictly adhering to the set of guidelines.

The most commercially successful pop songs from three albums that were released during the years 2014 and 2015 were used for analysis. The commercial success of these songs was gauged on the total number of Spotify plays paired with their success on the Billboard charts. The three chosen albums were Taylor Swift's 2015 album '1989', Ed Sheeran's 2014 album 'x', and One Direction's 2014 album 'Midnight Memories'. All three albums were chosen as a result of their worldwide popularity and commercial success.

The chosen songs were analysed with regards to tempo, time signature, key, song form/structure, chord progressions, harmony, rhythm, vocal melodies, vocal singing ranges, vocal timing, lyrics and production/arrangement.

This project looks at research and analysis within areas such as music theory, songwriting, arranging, audio engineering, production, mixing, critical listening and audio analysis. The practical side of the project involves audio analysis and the composing, producing, recording and mixing of a song.

This subject of research is important because a much deeper understanding of popular songwriting was gained which will help with future work endeavours and employment. The project in question was left with a piece of work that is of a professional standard and a set of guidelines that can be used for various future projects. The software 'Prezi' was also used to creatively display the set of guidelines making them very accessible and informative to anyone interested in this area of study/work.

Literature Review

This project looks at how commercially successful pop songs, that were released in 2014 and 2015, were composed. Determining if there was in fact some kind of formula to writing commercially successful pop songs from any period in time could prove to be very useful for anyone interested in both the study and practice of songwriting. The aim of the project was to compose a pop song using a set of guidelines built on the analysis carried out on 12 commercially successful songs from that period of time. The chosen topics of analysis were informed by research carried out from various sources that are discussed in this chapter. This literary review chapter explores research in areas such as the English language, songwriting, modes, the effect music has on the human body, listener engagement, vocal timing and music production.

The project in question aimed to compile a set of guidelines that, if followed would, aid in composing commercially successful songs. Before this set of guidelines could be compiled the areas of research and analysis needed to be decided on. As a result of reading the 2017 research article "Increase in salivary oxytocin and decrease in salivary cortisol after listening to relaxing slow-tempo and exciting fast-tempo music" (Ooishi et al.) the decision to analyse the tempos of each song was made.

This research article notes that relaxation and excitation are both common effects that people experience when listening to music and that the tempo of the music plays an important role in this. The authors of this article hypothesised that listening to relaxing slow-tempo and exciting fast-tempo music is accompanied by increases in the oxytocin and cortisol levels. Participants of this study were given both slow-tempo and fast-tempo music sequences to listen to, both of which lasted twenty minutes. As they listened to the music sequences their heart rates were measured to evaluate the strength of activity in their autonomic nervous systems[1] thus determining levels of excitement. Their saliva was tested to measure their levels of oxytocin.

[1] The autonomic nervous system is a control system that acts largely unconsciously and regulates bodily functions, such as the heart rate, digestion, respiratory rate, pupillary response, urination, and sexual arousal.

Oxytocin levels were measured because of its anti-stress and anti-anxiety effects thus determining levels of relaxation.

The results of the study concluded that listening to slow-tempo and fast tempo music both cause physiological changes in humans with regards to relaxation and emotional excitation. This study is important for the project in question as it clearly shows that the tempo of music has an impact on how humans feel so it must be included in the list of elements to analyse in the twelve songs.

The analysis of tempo alone would not be sufficient to compile an entire set of guidelines which if followed would aid in a song's ability of achieving commercial success. The most logical element of a song to analyse next would be the time signature. Alexandra Belibou's 2018 research paper titled "The rhythm of popular music" looks at the importance the role of rhythm plays in popular music among youths.

During the research phase of this study Belibou asked a multiple choice question to 206 Romanian people with an average age of twenty-five years. The question was "what musical-constructive element draws your attention when listening to music?". The 4 possible answers were : rhythm, melody, video and lyrics. Rhythm was the most common answer with a total of 75 people choosing it. Belibou then goes on to explain one of her theories as to why rhythm was the most common answer among young people by referring to Maslow's hierarchy of needs (see fig.1).

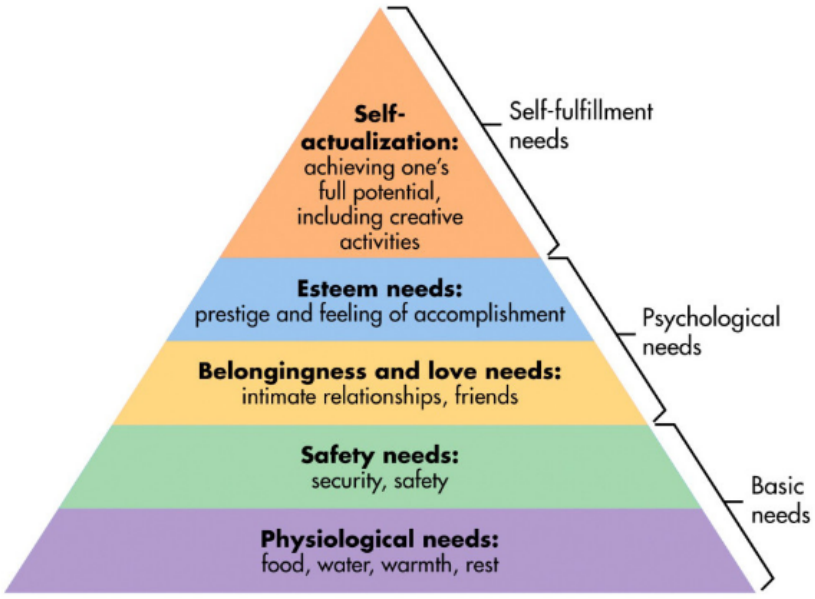


Fig.1 - Maslow's hierarchy of needs chart

Maslow's hierarchy of needs addresses the different needs that motivate human behaviour. As shown in fig.1 : security and safety is one of the basic needs humans crave. Belibou argues that :

> "the need for safety in the case of young people is satisfied by current music auditions based on repeated (predictable) rhythm" (Belibou, 2018, p.23)

Based on Belibou's findings that listening to popular music is a means for young people to meet their most basic needs, the analysis of time signatures of the twelve chosen songs for the project in question will be carried out. It will be interesting to note if the findings of the project in question back up Belibou's research regarding the topic of repeated rhythms in popular music.

The topic of song lyrics and their simplicity is an area that the project in question is greatly interested in analysing. A 2021 research article titled "Why are song lyrics becoming simpler? A time series analysis of lyrical complexity in six decades of American popular music" (Varnum et al.) looks at the idea that song lyrics have become increasingly simple over time.

The study looked at popular music in the United States (14,661 songs) from six decades (1958-2016) and used compression algorithms to evaluate the compressibility[2] of song lyrics. The songs were chosen based off the Billboard Hot 100 tracks for each year. The higher compression score a song received meant the more repetition was present in its lyric thus gauging its simplicity (See fig.2).

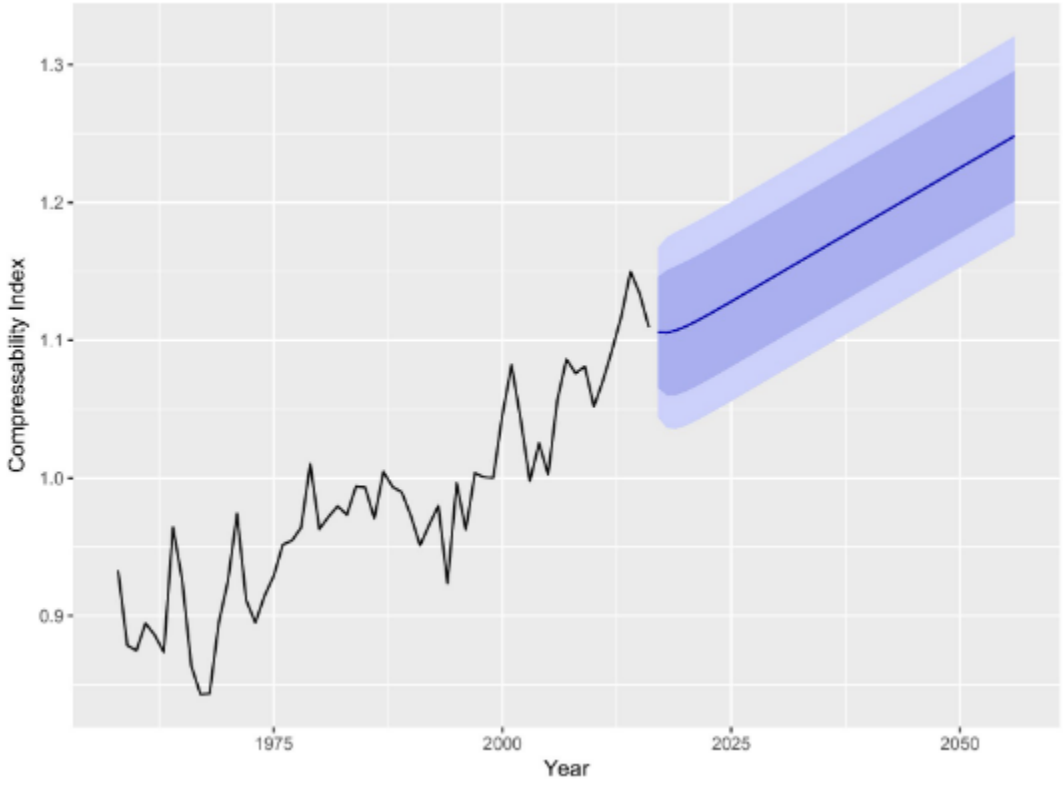


Fig.2 - Change in lyrical compressibility from 1958-2016 (Varnum et al. 2021, p.7).

As seen in the graph above, the study showed a clear trend in song lyrics becoming more simple over time. What was established from reading this research paper, that is relevant to the project in question, was that commercially successful popular song lyrics have a high level of simplicity. The tests carried out in the study relied only on the repetition of words/phrases to determine how simple a song's lyrics are. The project in question will analyse the repetition of certain words/phrases contained in the lyrics of the twelve chosen songs but feels that further analysis

[2] Compressibility indexes the degree to which song's lyrics have more repetitive and less information dense, and thus simpler, content.

would be of great benefit in establishing a clear set of guidelines for the proposed blueprint the project in question set out to create. An example of this further analysis is to look at the breakdown, in percent, of one, two and three or more syllable words used in a song's lyrics.

An important point raised in a preceding discussion was that various elements that make up music can have an influence on human emotions. As seen in the 2014 research paper “The Influence of Mode and Musical Experience on the Attribution of Emotions to Melodic Sequences” (Straehley and Loebach), the mode a piece of music is written in can have an impact on the emotion a person feels while listening to it.

In Straehley and Loebach’s study thirty-four participants, with varying levels of musical experience, were given sequences of musical scales and melodies to listen to. The musical sequences consisted of randomised notes within each of the seven diatonic modes and the major-minor scale. They then rated how each piece of music made them feel with regards to emotion. The range of emotions used for measurement in this study can be seen in fig.3.

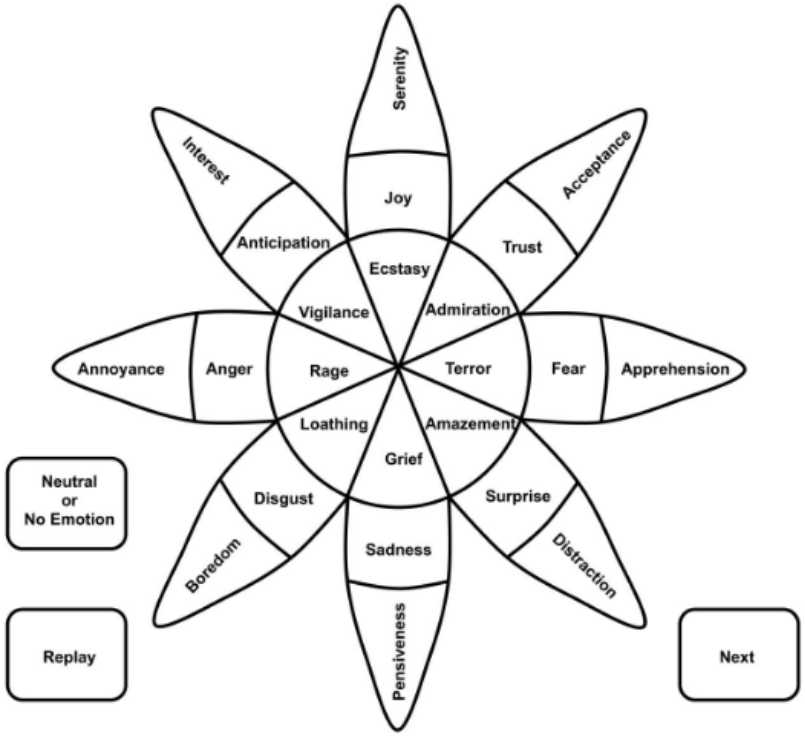


Fig.3 - Example response chart used in study (Straehley and Loebach, 2014, p.25)

The results of the study showed that mode influences perceived emotion in consistent ways for participants regardless of their level of musical experience beyond mere associations with Ionian and Aeolian. This study is relevant for the project in question as it sheds light on the idea that perhaps commercially successful music is successful as a result of how it makes the listener feel. Modes is something that will be analysed in all twelve chosen songs for the project in question.

The project in question will be analysing and taking apart the most popular songs from three albums that were released in 2014 and 2015. The 2015 book "Song Interpretation in 21st-Century Pop Music" presents research in the field of popular musicology. The focus of this book is on popular music of the twenty-first centuries.

The authors (Appen et al.) are concerned with criticism and analysis of the music itself, as well as locating musical practises, values and meanings in cultural context. In this book we are presented with a breakdown of Ke$ha's 2010 song 'Tik Tok'. This song was co-produced by Benny Blanco. Blanco also produced one of the albums being analysed in the project in question, Ed Sheeran's album 'x'.

This book gives insights into musical and production tricks used by the professionals who produced the track. Examples of these tricks are how to make the listener feel more engaged with a track and how to make them want to sing along. The combined use of double tracking, panning and the repeated use of the lyrics "we" and "our" contribute in achieving the listeners feeling of involvement. We also learn that singing a chorus melody in a higher register than any other section of a song is a common trick that professional producers use. Using this technique results in an increase of emotional intensity and helps make a chorus stand out. (Appen et al. 2015, p.41)

For the project in question, the use of the techniques discussed will be kept in mind when composing and producing the pop song. The use of certain pronouns to engage the listener will

be analysed in the lyrics of all twelve tracks along with analysis on the range of notes sung in each section of the songs.

The project in question aims to write and produce a pop song after studying and analysing songs from three pop albums that were released in the years 2014 and 2015. Ryan Tedder's 2021, three part video tutorial course on Monthly.com is an in-depth look at a professional approach to songwriting.

Ryan is a multi-award winning songwriter, producer and artist. He writes and produces songs for his own band One Republic. He also writes and produces songs for some of the biggest names in pop music such as Beyoncé, Maroon 5 and Adele. All three of the artists/bands being studied by the project in question have, at some time, hired Ryan Tedder to co-write and produce songs for albums they have released.

Part three of the course, 'Collaboration & The Sound of an Artist', is particularly beneficial for the project in question. In part three, Ryan demonstrates how to write and produce a song with a collaborator. Ryan works with an artist in the studio in real time, explaining how he crafts a song that captures their personality and sound. In his video lesson #13 'Collaboration Part: Getting Started', Ryan discusses what to do if you are struggling to write a song from scratch for another artist. One technique he uses when he has writer's block is to loop a section of a song that the artist has previously recorded and released. He will then write a new melody and lyric over it. Once he is content with what he has composed he will delete the looped section of the old song and start building a new song from the new melody and lyric he has come up with.

The techniques taught on this video course will be kept in mind when composing the song for the project in question. Particularly the techniques on how to deal with writer's block.

The project in question focuses a lot of its energy on the analysis of the vocals in all twelve songs. The reason for doing this is because, unlike most other musical elements, vocals are present in all of the songs chosen for analysis and all of the songs featured on Billboard's Hot 100 charts from 2014 and 2015. It is clear that vocals played a big part in the commercial success of pop songs in the years 2014 and 2015. The 2021 research paper titled “The Effect of Timing on the Singer’s Tone of Voice” (Schotanus) hypothesised that aligning phrase onsets with strong beats supports perceived sincerity.

In one online experiment carried out in the study fifty-two participants were presented with a series of short sung sentences, accompanied on the piano. After each sentence they were asked to answer seven questions concerning the stability, emotionality, aesthetic quality of the music, and three questions regarding the singer's sincerity, insecurity and compellingness. The results of the study found that a singer is perceived as being convincing/sincere if a stressed syllable occurs on beat. If a stressed syllable proceeds the main beat the singer’s tone of voice is perceived as being relatively urgent. If a stressed syllable succeeds the main beat the singer’s voice is perceived as being upset.

As previously discussed in this chapter, music has the ability to make listeners feel certain ways. Vocal timing is clearly a tool used by songwriters to help enforce certain feelings upon listeners. As a result of this the timing of the lead vocal melody in the chosen songs will be a topic of analysis for the project in question.

For the project in question lyrics will have to be written for a pop song. The lyrics that are written should be in line with the style of lyrics that are featured in commercially successful songs released in 2014 and 2015. Pradikta’s 2017 research paper “Cognitive Linguistic Analysis of Love Metaphors in Ed Sheeran’s Songs” looks at lyrics found in Ed Sheeran’s songs.

This study analyses conceptual metaphors of love found in Ed Sheeran's lyrics. Pradikta selected twenty-five of the most popular songs from three of Ed's albums. The aim of this research paper was to find out the conceptual metaphors of love and the source domains of love used to convey love.

Across the twenty five songs it was found that the conceptual metaphor of love being a journey was the most commonly used metaphor in Sheeran's lyrics. It showed up fifteen times, which is twice as much as any other metaphor found in the study.

The use of the conceptual metaphor of love being a journey will be kept in mind when composing the lyrics for the pop song for the project in question.

All of the research presented in this literature review chapter has been instrumental in informing decisions regarding what topics should be analysed in relation to the twelve chosen songs. It has also informed methods on how to carry out analysis and has provided insight into how songs that achieve commercial success are written. In the next chapter, the reasons why the twelve particular songs were chosen for analysis will be discussed along with how and why various topics of analysis were carried out.

Methodology

Following on from the literary reviews, the methodology will now be discussed. The project in question looks at the compositional techniques involved in writing pop music with a focus on music released in 2014 and 2015. The project consists of dissecting pop songs from that era, analysing how they were constructed and then putting into practice what was learnt.

There were 4 main stages for this project:

- The choosing of the songs to be analysed
- The analysis of the chosen songs
- The creation of the proposed set of guidelines based on the analysis
- The songwriting, production and mixing of a pop song

The Choosing of the Songs to be Analysed

Before any analysis of any songs could be carried out, adequate songs needed to be chosen to be analysed. The project in question began by searching through the Billboard 200 Albums Year-End Charts lists[3]. To increase the scope of the study the project in question decided it would benefit from studying three different types of artists. It was decided that one solo male act, one solo female act and one band would be chosen for the study. In 2015, the number one ranked album was Taylor Swift's '1989', and the number two ranked album was Ed Sheeran's 'x'. Between the years 2014 and 2015 the highest ranked band was One Direction. Their album 'Midnight Memories' was ranked fourth place in the 2014 charts. It was decided that these three albums would be used for the project in question as they were each the most commercially successful within their own categories over the two years.

After a meeting with the project's mentor, Vasileios Gourgourinis, it was decided that the project would benefit from choosing four songs from each album to analyse as not every song off each of the three albums achieved commercial success. The project in question's aim was to compile a set of guidelines for writing pop songs, not pop albums. Research was carried out to

[3] https://www.billboard.com/charts/year-end/2015/top-billboard-200-albums/ and https://www.billboard.com/charts/year-end/2014/top-billboard-200-albums/

see which of the songs had the most plays on Spotify[4]. Research was also carried out on both the US and UK chart positions of all songs[5]. The most popular songs in relation to these figures were then chosen to be analysed. The chosen songs were as follows:

- Ed Sheeran - Thinking Out Loud, Don't, Sing and Photograph.
- Taylor Swift - Shake It Off, Blank Space, Style and Bad Blood.
- One Direction - Story Of My Life, Best Song Ever, Midnight Memories and Diana.

The Analysis of the Chosen Songs

Once the decision on which twelve songs would be used for analysis was finalised, a Pro Tools session was created. All twelve songs were imported into it. Each song was put on its own individual stereo track and positioned along the timeline so that no two songs overlapped each other (see fig.4).

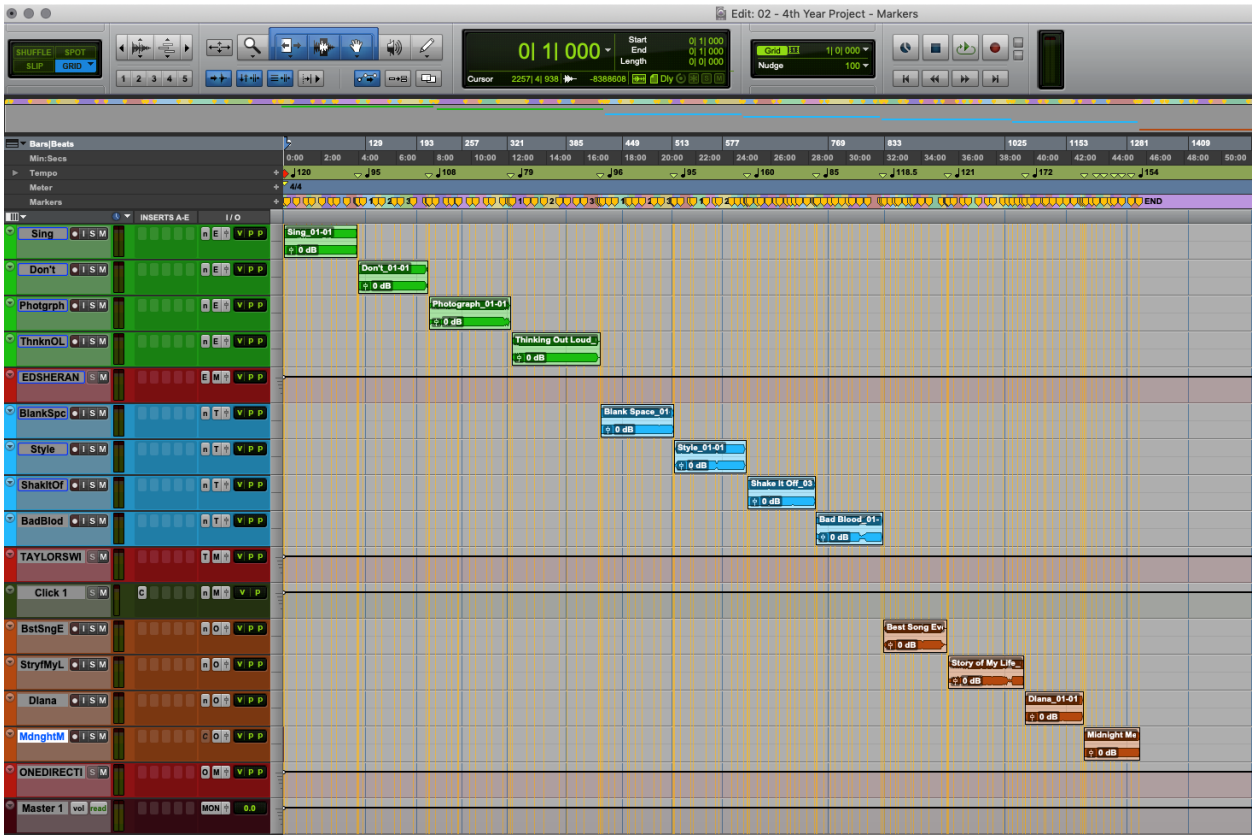


Fig.4 - Screenshot of Pro Tools session setup for tempo and structure analysis.

[4] See Appendix A
[5] See Appendix B

It was important that no two songs overlapped each other as separate tempo maps and markers needed to be created for each individual song. Using the tempo maps the exact tempo and time signatures were found for each individual song. The keys and modes of each song were also figured out by playing along with them on the guitar/piano. Markers were then placed so that measurements of exact lengths of individual sections such as verses, choruses and bridges could be noted (see fig.5).

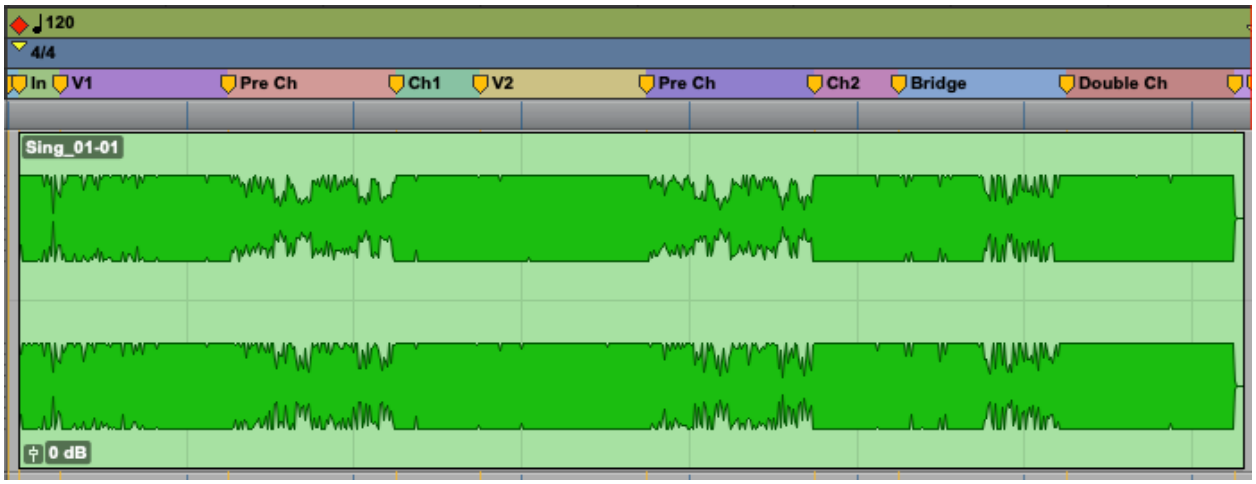


Fig.5 - Example of marker placement in Pro Tools session for Ed Sheeran's song 'Sing'.

As a result of watching the 2013 Music Matters seminar titled 'How to Write a Hit!' (All That Matters) the decision to note durations (in secs) of intros, if any, durations of entire songs and durations before a chorus section appears in a song was added to the list of topics to be analysed in the twelve chosen songs. Ralph Murphy, who was a professional songwriter for over 4 decades and also the vice president of ASCAP[6] gave the seminar. During the seminar Ralph discusses how he spends three weeks of every year analysing every number one song on the Billboard Pop chart to see what they have in common with each other. Murphy's reason for doing this is because his industry 'relies heavily on what was just successful as a projection for what will be successful' and 'the average listener expects to receive information a certain way'.

[6] The American Society of Composers, Authors and Publishers.

As a result of advice given by the project's mentor, Vas, Isotopes RX9 music rebalancing software was used to separate the elements in each one of the songs to aid in the next phase of the analysis process. The project in question availed of the thirty day free trial of the RX9 software available to download from their website[7]. This software splits a full stereo mix of a song into four separate stereo tracks. One track with isolated vocals, one with isolated drums/percussion, one with isolated bass and one with everything else that is left from the full mix. The software was used on all twelve songs and the isolated stems were imported into the protools session (see fig. 6).

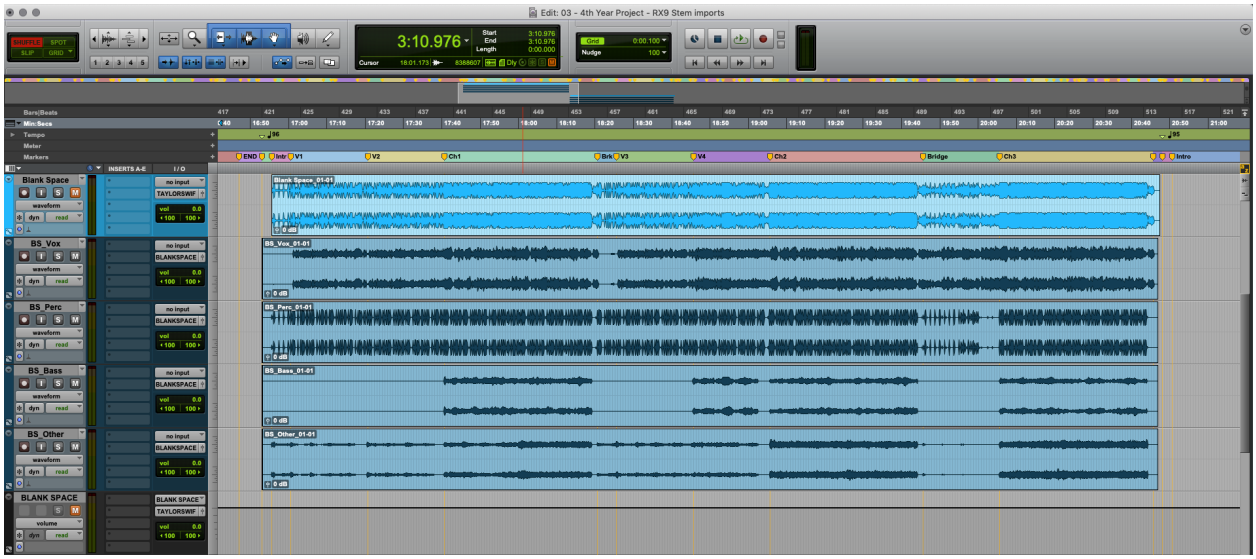


Fig. 6 - Example of isolated stems imported into Pro Tools session for Taylor Swift's song 'Blank Space'.

Vocals and drums/percussion were two of the only elements that featured on every track chosen for analysis. As a result of this it was hypothesised that vocals were a necessary element to have in a song to achieve commercial success in the years 2014 and 2015. To what extent they were used in each song became a topic of analysis. With Pro Tools in shuffle mode, the silence on each isolated vocal track was deleted. The duration of what audio remained on the isolated vocal tracks was noted and these figures were used to find the exact percentage of each song's entire duration that contained vocals. The same process was carried out on the isolated drum tracks to find the exact percentage of each song's entire duration that contained drums/percussion.

[7] https://www.izotope.com/en/shop/rx-9-advanced.html

The next step of the analysis work involved lyric analysis. The website Genius.com[8] was used to aid in the analysis work as it has a massive archive of official song lyrics for the pop genre. The first step of the lyric analysis was to measure the exact amount of words in each song. This was done so that percentages could be measured for other areas of analysis with regards to lyrics.

The decision to note the duration (in secs) before the pronoun 'you' was used in a song was informed by Ralph's seminar mentioned earlier (All That Matters, 2013). The decision to note the amount of repetitions of words contained in the title of the songs was also informed by this seminar. Ralph states that it is important for a hit song's title to be repeated throughout its duration. His reasoning for this is based on the scenario of someone hearing a song on the radio for the first time but not knowing what the title of it is. Having a title that is heavily repeated in a song's lyrics increases the chance of a first time listener being able to find the song online themselves, later on, without being told what the title of the song actually is. The project in question decided to add the repetition of the pronoun 'I' into this part of the analysis as the use of many pronouns help with listener engagement (Appen et al. 2015).

As discussed in the literary review chapter of this paper there is evidence to suggest that popular song lyrics have progressively become more simple over time (Varnum et al.). The project in question hypothesised that this may be due to the need that for a song to be commercially successful it must appeal to a wide range of people from all over the world. English is one of the most commonly spoken languages in the world however it is not everyone's first language. The project in question analysed the level of english used in each song by counting how many one syllable, two syllable and three or more syllable words were used in each individual song. The exact breakdown in percentages of each category used was worked out.

[8] https://genius.com/

Following on from the lyric analysis portion of this study, analysis work on the production/arrangement of a select few of the songs was carried out. In the interest of time, it was recommended by the project's mentor to analyse the most commercially successful song from each album up until the end of the first chorus for this portion of the study. Those songs were as follows :

- Best Song Ever - One Direction
- Thinking Out Loud - Ed Sheeran
- Blank Space - Taylor Swift

Each song was listened to and every element that featured in the song was noted. Some examples of these elements were kick drum, snare drum, bass, vocals, backing vocals, piano and synths along with many more. The exact areas of the songs that each element featured in was also noted. The aim of this portion of the study was to determine the longest amount of time (in bars) that no new element was introduced or no element dropped out. As seen in Ryan Tedder's Monthly.com songwriting course, frequent changes in production/arrangement are crucial in keeping the listeners attention (Tedder, 2021).

The final area of analysis work was carried out on the lead vocal melodies and chord progressions used in each song. The free to use music notation software MuseScore 3[9] was used to aid in the analysis work. Having a visual representation of each song in the form of a score was necessary for much of the analysis work carried out on the vocal melodies. The waveforms in Pro Tools were of no use for this portion of the analysis work.

The analysis work began by determining the exact chord progressions used in each song. The chord progressions were figured out by playing along to the songs on the piano/guitar. Once they had been established they were inputted into separate scores in the MuseScore 3 software. The isolated vocal stem tracks from the Pro Tools session were then used to figure out the exact lead vocal melodies being sung in each song. Once they had been established they

[9] https://musescore.org/en/download

were inputted into the separate scores in the MuseScore 3 software. These scores were then used to analyse the following things :

- Number of notes sung in each song. These figures were used to build percentages for other areas of analysis.
- Vocal melody shapes.
- Range of sung notes per section of each song. This analysis was carried out as a result of the advice given by Tedder, in his songwriting course, to save the highest sung note in a song for the chorus to help that section stand out (Tedder, 2021).
- The amount of completely consonant[10], partially consonant[11] and dissonant[12] notes sung in choruses.
- Percentage breakdown of the different scale degree notes used in each song.
- The exact timing of the first note of each vocal melody in every section of every song. This analysis was carried out as a result of knowledge gained from watching Blake McLain's 2020 Youtube video 'Producer Reacts to ENTIRE One Direction Album - Midnight Memories (I Love KFC)' (Blake McLain, 2020). McLain is a professional pop music producer. In this particular video he gives insight into production techniques found on the One Direction album 'Midnight Memories'. One of the insights that he provides is how variations in the timing of vocal melodies on a section by section basis is used to help make every section of a song sound fresh.

[10] Chord tones.
[11] Tension notes, passing notes, non-chord tones.
[12] Non-chord tones from a different key.

The Creation of the Proposed Set of Guidelines Based on the Analysis

As seen in the next chapter of this research paper, tables were drawn up for the various different topics of analysis. Exact percentages of ranges of values for certain areas of analysis were calculated. Any traits/findings that were common between 100% of the songs, such as the use of a 4/4 time signature, were added straight to the proposed set of guidelines. A minimum figure was proposed for areas of analysis, such as the percentage of sung vocals in a song, that didn't have a figure that was common between all songs analysed. A maximum figure was proposed for areas of analysis, such as the maximum length of an intro, that didn't have a figure that was common between all songs analysed. Ranges were proposed for areas of analysis, such as song tempos, where there was no clear common figure between the songs that were analysed. The presentation software 'Prezi' was then used to display the proposed set of guidelines in an informative and easy to follow way with the intention of making the findings more accessible to as wide an audience as possible.

The Songwriting, Production and Mixing of a Pop Song

Drawing from all of this analysis work, the set of proposed guidelines was compiled. A song was then written and produced with the project in question consciously adhering to the proposed set of guidelines. All of the methods of analysis discussed earlier in this chapter were used to carry out an analysis of the newly written pop song to make sure it was inline with all of the proposed guidelines. Any changes that needed to be made were made to ensure the song was in line with every guideline. The song was then mixed and some mild mastering/limiting was applied to get it up to a healthy volume level.

The songwriters, artists and producers being researched for this project are the best in the business. They have been working in the music industry for years, some for decades. The project in question was not expecting to be able to write a worldwide successful hit during this project. It takes years of music analysis and practice to enable someone to do that. The project in question had time constraints to abide by. That meant only a small pool of songs could be analysed from a relatively small period of music history. There is also a lot more involved in

writing commercially successful pop songs than what has been analysed in this study. The project in question did its best to analyse what, based on the research carried out in the literary review chapter, were the most important elements that aided the twelve songs in achieving commercial success. As a result, the proposed guidelines should act more as a foundation to build pop songs from and a general guideline to get that 2014/2015 pop song sound.

In the following chapter of this research paper the analysis of all twelve songs will be discussed. The exact findings will be presented in the form of tables, scores and screenshots where appropriate. Observations on the findings will be discussed and the proposed set of guidelines will be compiled that, if followed, could have aided in the writing of a commercially successful song in 2014/2015.

Analysis

This chapter presents analysis work carried out on twelve commercially successful songs from three separate albums that were released in the years 2014 and 2015. The aim of this research was to see to what extent a set of guidelines could be compiled, based on the findings, that could have aided the process of writing a commercially successful pop song in 2014 and 2015. Analysis was carried out on the songs in areas such as tempo, time signature, key, mode, structure, chord progressions, vocal melody ranges, vocal melody shapes, vocal melody timing, lyrics, drums/percussion use and production/arrangement variation.

Analysis for the project in question began by deciding what albums to analyse from the years 2014 and 2015. To maximise the scope of the research it was decided that an album by one solo male artist, one solo female artist and one band would be selected for analysis. Data was collected from Billboards 'Billboard 200 Album - Year End Charts' ('Billboard 200 Albums') from the years 2014 and 2015. The highest solo male album on the chart from either year was Ed Sheeran with 'x' in second place on the 2015 chart. The highest solo female album from either year was Taylor Swift with '1989' in first place on the 2015 chart. The highest band album from either year was One Direction with 'Midnight Memories' in fourth place on the 2014 chart.

With the three albums having been selected it was then time to decide which four songs off each album would be analysed. A mix of Spotify plays and song charting positions were analysed to see which songs achieved the most commercial success[13]. Analysis was then carried out with the main goal of finding any similarities shared among the twelve songs.

[13] See Appendix A and B.

Song Tempos, Time Signatures and Keys/Modes

Song	Tempo (in bpm)	Time Signature	Key
Sing	120	4/4	G# Minor
Don't	95	4/4	F Minor
Photograph	108	4/4	E Major
Thinking Out Loud	79	4/4	D Major
Blank Space	96	4/4	F Major
Style	95	4/4	D Major
Shake It Off	160	4/4	G Major
Bad Blood	170	4/4	G Major
Best Song Ever	118.5	4/4	C# Major
Story Of My Life	121	4/4	Eb Major
Diana	172	4/4	D Major
Midnight Memories	157/154	4/4	E Major (mixolydian)

Fig. 7 - Song tempo, time signature and key data.

Analysis of the data seen in fig. 7 is as follows :

- The most commonly used time signature was 4/4 with 100% of songs using it. No song changed time signature at any stage. An observation made about this analysis is that songs that were written in a 4/4 time signature had the highest chance of having commercial success in 2014 and 2015.
- There was no clear common tempo similar across the twelve songs. One song used a tempo less than 95 bpm. 91.7% of the songs used a tempo between 95 bpm and 172 bpm and remained at the same tempo throughout the entire duration of the song. Observations made about these findings are that songs written at a constant tempo ranging from 95-172 bpm had the highest chance of gaining commercial success in 2014 and 2015.

- 83.3% of the songs analysed were written in major keys. 100% of the songs analysed remained in a single key for their entire duration. Observations made about this analysis are that songs that were written in a major key and remained in a single key had the highest chance of gaining commercial success in 2014 and 2015. Although songs in minor keys still had success, they were far less common.
- 91.7% of the songs analysed use either the ionian or aeolian mode. The mixolydian mode was used during certain sections of only one of the songs. An observation made about this analysis is that songs written in either the ionian or aeolian modes had the highest chance of gaining commercial success in the years 2014 and 2015. Although songs written using other modes can still be successful, they are far less common.

Structure

The next area of analysis work carried out on the twelve songs was on their structure :

Song	Duration of Song (m:s)	Duration of Song in Seconds	Intro Duration (s)	Duration Until Chorus (s)
Sing	3:55	235	8 (3.4%)	72 (30.6%)
Don't	3:40	220	13 (5.9%)	53 (24%)
Photograph	4:19	259	18 (6.9%)	71 (27.4%)
Thinking Out Loud	4:42	282		73 (25.9%)
Blank Space	3:52	232	5 (2.2%)	45 (19.4%)
Style	3:51	231	20 (8.7%)	61 (26.4%)
Shake It Off	3:39	219	6 (2.7%)	42 (19.2%)
Bad Blood	3:32	212		
Best Song Ever	3:20	200	20 (10%)	45 (22.5%)
Story Of My Life	4:05	245	16 (6.5%)	63 (25.7%)
Diana	3:05	185	14 (7.6%)	36 (19.5%)
Midnight Memories	2:56	176	3 (1.7%)	37 (21%)

Fig. 8 - Song duration, intro section duration and duration until chorus section data.

Song	Intro	Verse	Pre Chorus	Chorus	Break	Interlude	Bridge	Post Chorus	Outro
Sing	4 bars	16 bars	16 bars	8 bars			16 bars		
Don't	5 bars	16 bars		8 bars					
Photograph	8 bars	16 bars	8 bars	16 bars	2 bars		8 bars		8 bars
Thinking Out Loud		16 bars	8 bars	10 bars			8 bars		5 bars
Blank Space	2 bars	16 bars		16 bars	2 bars		8 bars		
Style	8 bars	12 bars	4 bars	16 bars			8 bars		
Shake It Off	4 bars	16 bars	8 bars	16 bars		8 bars	10 bars	8 bars	
Bad Blood		16 bars	8 bars	16 bars			18 bars		
Best Song Ever	10 bars	8 bars	4 bars	8 bars			12 bars	4 bars	8 bars
Story Of My Life	8 bars	16 bars	8 bars	16 bars			8 bars		10 bars
Diana	10 bars	16 bars		16 bars	4 bars		16 bars	16 bars	4 bars
Midnight Memories	2 bars	14 bars	8 bars	16 bars			18 bars		1 bar

Fig. 9 - Breakdown of the number of bars in each section of each song.[14]

[14] See Appendix C for further information on how this data was compiled.

Analysis of the data seen in fig. 8 is as follows :

- 75% of the songs analysed were under four minutes in total duration. 91.7% of the songs analysed were over three minutes in total duration. An observation made about this analysis is that songs written with a total duration of between three and four minutes had the highest chance of gaining commercial success in the years 2014 and 2015.
- 83.3% of the songs analysed used an intro section. The longest intro used was 10% of the total duration of a song. Observations made about this analysis are that songs that contained an intro section and lasted no more than 10% of the songs total duration had the highest chance of gaining commercial success in the years 2014 and 2015.
- In 100% of the songs analysed a chorus section was heard within the first 73 seconds. An observation made about this analysis is that songs written with choruses that are heard within the first 73 seconds had the highest chance of gaining commercial success in the years 2014 and 2015.

Analysis of data seen in fig. 9 is as follows :

- 100% of the songs analysed contained a verse. 75% of the songs analysed had verses that lasted sixteen bars. The observations made about this analysis are that songs containing a verse that lasted sixteen bars had the highest chance of gaining commercial success in the years 2014 and 2015.
- 75% of the songs analysed contained a pre chorus. 88.9% of the songs that contained a pre chorus had a pre chorus that lasted either four or eight bars. Observations made about this analysis are that songs containing pre choruses that last either four or eight bars had the highest chance of gaining commercial success in the years 2014 and 2015.
- 100% of the songs analysed contained a chorus. 66% of the songs analysed had a chorus that lasted sixteen bars. Observations made about this analysis are that songs containing choruses that lasted sixteen bars had the highest chance of gaining commercial success in the years 2014 and 2015.
- 91.7% of the songs analysed used a bridge. The amount of bars used in the bridges ranged from eight to sixteen. The most common amount of bars used in bridges was

eight bars. 45% of the songs that used bridges had bridges that lasted eight bars. Observations made about this analysis are that songs containing bridges that last eight bars had the highest chance of gaining commercial success in the years 2014 and 2015.

- 50% of the songs analysed used outros. No outro lasted more than ten bars. Observations made about this analysis are that the commercial success of a song did not rely on the use of an outro section in the years 2014 and 2015. However, if one was used it should last no more than ten bars.
- Using the data gathered from the analysis the most common song form/structure for a successful pop song in 2014 and 2015 was : Intro - Verse - Pre Chorus - Chorus - Bridge.

Chord Progressions

The next area of analysis work carried out on the twelve songs was on the chords and chord progression used.

Song	Key	Intro	Verse	Pre Chorus	Chorus	Break	Bridge	Post Chorus	Outro
Sing	G# Minor	i	i-iv-i-iv	i-iv-i-iv	i-iv	-	i-iv-i-iv	-	-
Don't	F Minor	i-v-VI-VII	i-v-VI-VII	-	i-v-VI-VII	-	-	-	-
Photograph	E Major	I-vi-V-IV	I-vi-V-IV	vi-IV-I-V	I-V-vi-IV	-	vi-IV-I-V	-	I-V-vi-IV
Thinking Out Loud	D Major	-	I-I-IV-V	ii-V-I-ii-V ii-V-vi-ii-V	I-I-IV-V vi-V-IV-I-ii-V-I	-	I-I-IV-V	-	vi-V-IV-I-ii-V-I
Blank Space	F Major	I	I-vi-IV-V	-	I-vi-ii-IV	I	N.C	-	-
Style	D Major	vi-IV	vi-IV	ii-iii-IV	I-IV-I-IV I-IV-vi-IV	-	I-IV-I-IV	-	-
Shake It Off	G Major	N.C	ii-IV-I-I	ii-IV-I-I	ii-IV-I-I	-	ii-IV-I-I	ii-IV-I-I	-
Bad Blood	G Major	-	IV-I-V-vi	IV-I-V-vi IV-I-V	IV-I-V-vi	-	IV-I-V-vi	-	-
Best Song Ever	C# Major	I IV-I-V	IV-I-V	IV-V	IV-I-V	-	IV-I-V	IV-I-V	IV-I-V
Story Of My Life	Eb Major	vi-I	vi-I vi-IV-I	IV-V-vi V	I-IV-vi-IV-I	-	ii-V	-	I-IV-vi-IV-I
Diana	D Major	IV-vi-V	IV-vi-V	-	I-V-I-IV-I-IV-V	IV-vi-V	iii-IV-V-vi iii-IV-V-IV-IV	I-V-I-IV-I-IV-V	IV-vi-V
Midnight Memories	E Mixolydian/ E Major	N.C	I	IV-*bVI-VII	I-IV-V	-	vi-IV-I-V	-	I

Fig. 10 - Data on the various chords and chord progressions used in each section of each song. *borrowed chord

Analysis of data seen in fig. 10 is as follows :

- The lowest amount of different chords used in any song analysed was two. The highest amount of different chords used in any song analysed is five. 50% of the twelve songs analysed used five different chords. 25% of the twelve songs analysed used four different chords. An observation made about this analysis is that songs containing five or less different chords had the highest chance of gaining commercial success in the years 2014 and 2015.
- 100% of the songs written in a major key that were analysed contained the I, IV and V chords. 80% of the songs analysed written in major keys contain the vi chord. 20% of the songs written in a major key that were analysed contain the iii chord. 40% of the songs written in a major key that were analysed contain the ii chord. 0% of the songs analysed written in major keys contain the vii° chord. Observations made about this analysis are that songs written in major keys that contained the I, IV, V, vi and not the vii° chord had the highest chance of gaining commercial success in the years 2014 and 2015.
- 100% of the songs that were written in a minor key that were analysed contained the i chord. 50% of the songs analysed written in minor keys contained the iv, v, VI and VII chords. 0% of the songs analysed written in minor keys contained the III or ii° chords. Observations made about this analysis are that songs written in minor keys that contained the i and not the ii° and III chords had the highest chance of gaining commercial success in the years 2014 and 2015.
- 8.3% of the songs analysed contained a borrowed chord (bVI). An observation made about this analysis is that songs that did not contain borrowed chords had the highest chance of gaining commercial success in the years 2014 and 2015.

Lyrics

The next area of analysis work carried out on the twelve songs was on lyrics.

Song	Number of Words Used	Number of 1 Syllable Words Used	Number of 2 Syllable Words Used	Number of 3+ Syllable Words Used
Sing	447	386 (86.4%)	52 (11.6%)	9 (2%)
Don't	601	517 (86%)	74 (12.3%)	10 (1.7%)
Photograph	321	254 (79.1%)	58 (18.1%)	9 (2.8%)
Thinking Out Loud	317	264 (83.3%)	42 (13.2%)	11 (3.5%)
Blank Space	502	435 (86.7%)	60 (12%)	7 (1.4%)
Style	391	346 (88.5%)	43 (11%)	2 (0.5%)
Shake It Off	592	519 (87.7%)	70 (11.8%)	3 (0.5%)
Bad Blood	479	438 (91.4%)	41 (8.6%)	0
Best Song Ever	396	353 (89.1%)	36 (9.1%)	7 (1.8%)
Story Of My Life	354	291 (82.2%)	63 (17.8%)	0
Diana	277	222 (80.1%)	37 (13.4%)	18 (6.5%)
Midnight Memories	274	211 (77%)	48 (17.5%)	15 (5.5%)

Fig. 11 - Data on the percentage breakdown of different syllable words used in the lyrics of the twelve songs.

Analysis of data seen in fig. 11 is as follows :

- The highest percentage of three or more syllable words used in any song analysed was 6.5%. An observation made about this analysis is that songs whose total percentage of three or more syllable words used did not exceed 6.5% had the highest chance of gaining commercial success in the years 2014 and 2015.
- The highest percentage of two syllable words used in any song analysed was 18.1%. An observation made about this analysis is that songs whose total percentage of two syllable words used did not exceed 18.1% had the highest chance of gaining commercial success in the years 2014 and 2015.

- The highest percentage of one syllable words used in any song analysed was 91.4%. An observation made about this analysis is that songs whose total percentage of one syllable words used did not exceed 91.4% had the highest chance of gaining commercial success in the years 2014 and 2015.

Song	Number of Words Used	Repetition of Title/Words Contained in Title	How Many Times the Pronoun "You" is Used	How Many Times the Pronoun "I" is Used	Duration of Song in Seconds	Duration Before the Pronoun "You" is Sung (s)	Duration Before the Pronoun "I" is Sung (s)
Sing	447	7 (1.6%)	29 (6.5%)	16 (3.6%)	235	12 (5.1%)	10 (4.3%)
Don't	601	19 (3.2%)	10 (1.7%)	39 (6.5%)	220	15 (6.8%)	13 (5.9%)
Photograph	321	2 (0.6%)	16 (5%)	8 (2.5%)	259	38 (14.7%)	29 (11.2%)
Thinking Out Loud	317	3 (0.9%)	6 (1.9%)	12 (3.8%)	282	8 (2.8%)	7 (2.5%)
Blank Space	502	3 (0.6%)	31 (6.2%)	30 (6%)	232	6 (2.6%)	8 (3.4%)
Style	391	11 (2.8%)	15 (3.8%)	15 (3.8%)	231	23 (10%)	44 (19%)
Shake It Off	592	78 (13.2%)	4 (0.7%)	87 (14.7%)	219	141 (64.4%)	5 (2.3%)
Bad Blood	479	15 (3.1%)	34 (7.1%)	10 (2.1%)	212	3 (1.4%)	15 (7.1%)
Best Song Ever	396	13 (3.3%)	12 (3%)	35 (8.8%)	200	37 (18.5%)	35 (17.5%)
Story Of My Life	354	20 (5.6%)	1 (0.3%)	24 (6.8%)	245	184 (75.1%)	19 (7.8%)
Diana	277	12 (4.3%)	24 (8.7%)	17 (6.1%)	185	18 (9.7%)	25 (13.5%)
Midnight Memories	274	6 (2.2%)	5 (1.8%)	18 (6.6%)	176	10 (5.7%)	25 (14.2%)

Fig. 12 - Data gathered on repetition of certain lyrics and durations before certain lyrics are sung.

Analysis of data seen in fig. 12 is as follows :

- 100% of the songs analysed contained at least two repetitions of the title of the song in their lyrics. An observation made about this analysis is that songs whose lyrics contained at least two repetitions of the song title had the highest chance of gaining commercial success in the years 2014 and 2015.
- 100% of the songs analysed contained the pronouns “you” and “I” in their lyrics and were repeated at least eighteen times combined. An observation made about this analysis is that songs whose lyrics contained at least eighteen repetitions of the lyrics “you” and “I” combined had the highest chance of gaining commercial success in the years 2014 and 2015.
- In 100% of the songs analysed the lyrics “you” or “I” were heard within the first thirty-five seconds. An observation made about this analysis is that songs whose lyrics contained the words “you” or “I” within the first thirty-five seconds had the highest chance of gaining commercial success in the years 2014 and 2015.

Vocals

The next area of analysis work carried out on the twelve songs was on the vocals.

Song	Duration in seconds	Duration of Sung Vocals in seconds	% of Song With Vocals
Sing	235	184	78.3%
Don't	220	190	86.4%
Photograph	259	181	69.9%
Thinking Out Loud	282	178	63.1%
Blank Space	232	198	85.3%
Style	231	171	74%
Shake It Off	219	191	87.2%
Bad Blood	212	194	91.5%
Best Song Ever	200	156	78%
Story Of My Life	245	169	69%
Diana	185	145	78.4%
Midnight Memories	176	140	79.5%

Fig. 13 - Data gathered on the duration of the songs that contain vocals.

Analysis of data seen in fig. 13 is as follows :

- In 100% of the songs analysed, vocals can be heard for at least 63.1%, and at most 91.5%, of a song's entire duration. An observation made about this analysis is songs that contain vocals for at least 63.1%, and at most 91.5%, of their entire duration had the highest chance of gaining commercial success in the years 2014 and 2015.

Song	Range of Notes Sang In Entire Song	# of Semitones	Range of Notes Sang In Verse	# of Semitones	Range of Notes Sang In Pre Chorus	# of Semitones	Range of Notes Sang In Chorus	# of Semitones	Range of Notes Sang In Bridge	# of Semitones
Sing	D#4 - D#6	24	F#4 - D#5	9	F#5 - D#6	9	C#5 - A#5	9	D#4 - D#6	24
Don't	Eb4 - F5	14	Eb4 - F5	14			Eb4 - C5	9		
Photograph	B3 - B5	24	B3 - A4	10	D#4 - B4	8	B4 - B5	12	B4 - F#5	7
Thinking Out Loud	A3 - A5	24	A3 - G5	22	A4 - G5	10	A4 - A5	12	A4 - D5	5
Blank Space	A3 - C5	15	Bb3 - Bb4	12			C4 - C5	12	A3 - C5	15
Style	B3 - D5	15	D4 - A4	7	B3 - D4	3	B3 - B4	12	D4 - D5	12
Shake It Off	G3 - G5	24	D4 - D5	12	E4 - B4	7	G3 - G5	24		
Bad Blood	E3 - D5	22	E3 - B3	7	G4 - D5	7	B3 - D5	15	D4 - B4	9
Best Song Ever	D#4 - A#5* *(Outro)	19	G#4 - G#5	12	D#4 - C#5	10	G#4 - G#5	12	C#5 - E#5	4
Story Of My Life	Eb4 - Ab5	17	Eb4 - D5	11	Eb4 - Ab4	5	Bb4 - Ab5	10	Bb4 - G5	9
Diana	A4 - B5* *(Post Chorus)	14	A4 - F#5	9			A4 - A5	12	A4 - F#5	9
Midnight Memories	B3 - C#6	26	B3 - A5	22	G4 - E5	9	E4 - A5	17	B4 - C#6	14

Fig. 14 - Data gathered on the range of pitches sung in the lead vocal melody in each verse, pre chorus, chorus and bridge section of each song.

Analysis of data seen in fig. 14 is as follows :

- The lowest note, with regards to pitch, sung in any of the songs analysed, was E3 and the highest was D#6. 8.3% of the songs analysed contain notes that span across more than two octaves (twenty-six semitones). The lowest range of notes used in a single song analysed was fourteen semitones. Observations made about this analysis are songs that contain vocals that remain within a range of notes no more than two octaves, no less than fourteen semitones and do not use notes outside of the range E3-D#6 had the highest chance of gaining commercial success in the years 2014 and 2015.
- 8.3% of the songs analysed used their highest sung note in a verse section. 16.6% of the songs analysed used their highest sung notes in a pre chorus section. 16.6% of the songs use their highest note in a section other than the verse, pre chorus, chorus or bridge. 25% of the songs analysed use their highest sung note in a bridge section. 50% of the songs analysed use their highest sung notes in a chorus section. An observation made about this analysis is songs that contain their highest sung note in either a chorus or bridge section had the highest chance of gaining commercial success in the years 2014 and 2105.
- 75% of the songs analysed have vocals that remain within the same twelve semitone range or lower during a verse section. 100% of the songs analysed, that use pre choruses, have vocals that stay within a range of ten semitones or lower during a pre chorus section. 75% of the songs analysed have vocals that remain within the same twelve semitone range or lower during a chorus section. 70% of the songs analysed, that use bridges, have vocals that stay within a range of twelve semitones or lower during a bridge section. Observations made about this analysis are that songs containing vocals that remain within a range of notes no more than twelve semitones for a verse section, ten semitones for a pre chorus section, twelve semitones for a chorus section and twelve semitones for a bridge section had the highest chance of gaining commercial success in the years 2014 and 2015.

Song	# of Notes Sang In Entire Song	# of 1st Scale Degree Notes Sang	# of 2nd Scale Degree Notes Sang	# of 3rd Scale Degree Notes Sang	# of 4th Scale Degree Notes Sang	# of 5th Scale Degree Notes Sang	# of 6th Scale Degree Notes Sang	# of 7th Scale Degree Notes Sang
Sing	668	213 (31.9%)	41 (6.1%)	113 (16.9%)	90 (13.5%)	114 (17.1%)	3 (0.4%)	94 (14.1%)
Photograph	427	140 (32.8%)	81 (19%)	145 (34%)	24 (5.6%)	19 (4.4%)	0 (0%)	18 (4.2%)
Thinking Out Loud	462	97 (21%)	101 (21.9%%)	111 (24%)	45 (9.7%)	83 (18%)	19 (4.1%)	6 (1.3%)
Blank Space	635	255 (40.2%)	92 (14.5%)	97 (15.3%)	59 (9.3%)	84 (13.2%)	16 (2.5%)	32 (5%)
Shake It Off	580	196 (33.8%)	134 (23.1%)	91 (15.7%)	27 (4.6%)	80 (13.8%)	52 (9%)	0 (0%)
Bad Blood	565	211 (37.3%)	54 (9.6%)	112 (19.8%)	0 (0%)	67 (11.9%)	50 (8.8%)	71 (12.6%)
Best Song Ever	423	156 (36.9%)	93 (22%)	55 (13%)	8 (1.9%)	58 (13.7%)	47 (11.1%)	6 (1.4%)
Diana	376	107 (28.5%)	105 (27.9%)	56 (14.9%)	0 (0%)	47 (12.5%)	35 (9.3%)	26 (6.9%)

Fig. 15 - Data gathered on percentage breakdown of different scale degree notes used in 8 of the songs analysed.

Analysis of data seen in fig. 15 is as follows :

For the songs analysed, that were written in major keys, the range of percentages of notes of different scale degrees are as follows:

- 1st scale degree : 21% - 40.2%
- 2nd scale degree : 9.6% - 27.9%
- 3rd scale degree : 13% - 34%
- 4th scale degree : 0% - 9.7%
- 5th scale degree : 4.4% - 18%
- 6th scale degree : 0% - 11.1%
- 7th scale degree : 0% - 12.6%

An observation made about this analysis is that songs written in major keys whose vocal melody scale degree usage remains within the ranges listed above had the highest chance of gaining commercial success in the years 2014 and 2015.

Only one of the songs analysed was in a minor key so please refer to the figures listed in fig. 15 for the song ‘Sing’ to see the percentage breakdown of the different scale degree notes used.

Song	# of Notes Sang in Chorus	# of Completely Consonant Notes Sang Over Chords	# of Partially Consonant Notes Sang Over Chords	# of Dissonant Notes Sang Over Chords	# of Times a Chord is Played in Chorus	# of Notes Sang on the Downbeat of a Chord	# of Completely Consonant Notes Sang on the Downbeat of a Chord	# of Partially Consonant Notes Sang on the Downbeat of a Chord	# of Dissonant Notes Sang on the Downbeat of a Chord
Thinking Out Loud	53	31 (58.5%)	22 (41.5%)	0 (0%)	23	14	12 (85.7%)	2 (14.3%)	0 (0%)
Photograph	71	40 (56.3%)	31 (43.7%)	0 (0%)	48	32	13 (40.6%)	19 (59.4%)	0 (0%)
Shake It Off	83	49 (59%)	34 (41%)	0 (0%)	8	8	2 (25%)	6 (75%)	0 (0%)
Bad Blood	71	45 (63.4%)	26 (36.6%)	0 (0%)	16	16	8 (50%)	8 (50%)	0 (0%)
Story Of My Life	64	51 (79.7%)	13 (20.3%)	0 (0%)	16	13	13 (100%)	0 (0%)	0 (0%)
Best Song Ever	49	27 (55.1%)	22 (44.9%)	0 (0%)	12	12	8 (66.7%)	4 (33.3%)	0 (0%)

Completely Consonant Notes = chord tones.
Partially Consonant Notes = tension notes, passing notes, non-chord tones.
Dissonant Notes = non-chord tones from a different key.

Fig. 16 - Data gathered on the use of completely consonant, partially consonant and dissonant notes in the chorus sections of six of the songs.

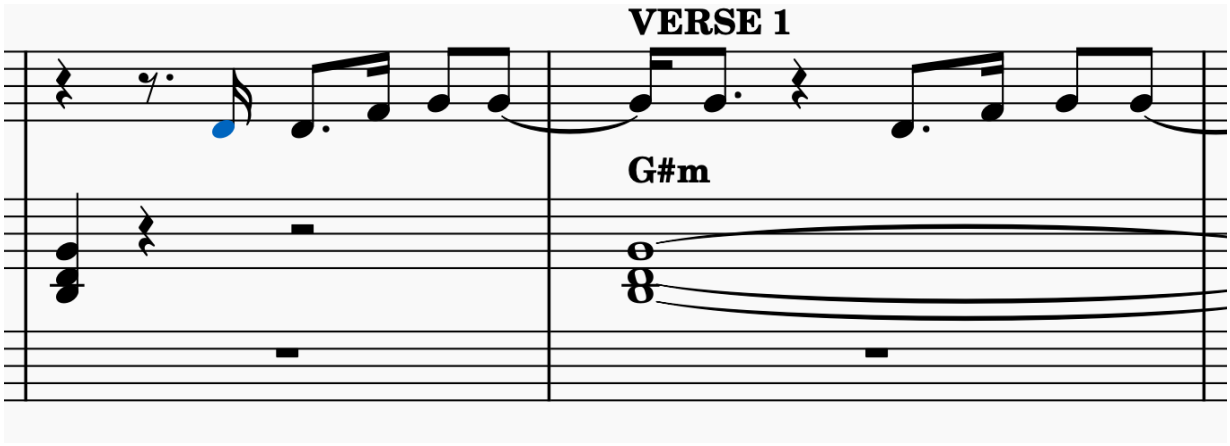
Analysis of data seen in fig. 16 is as follows :

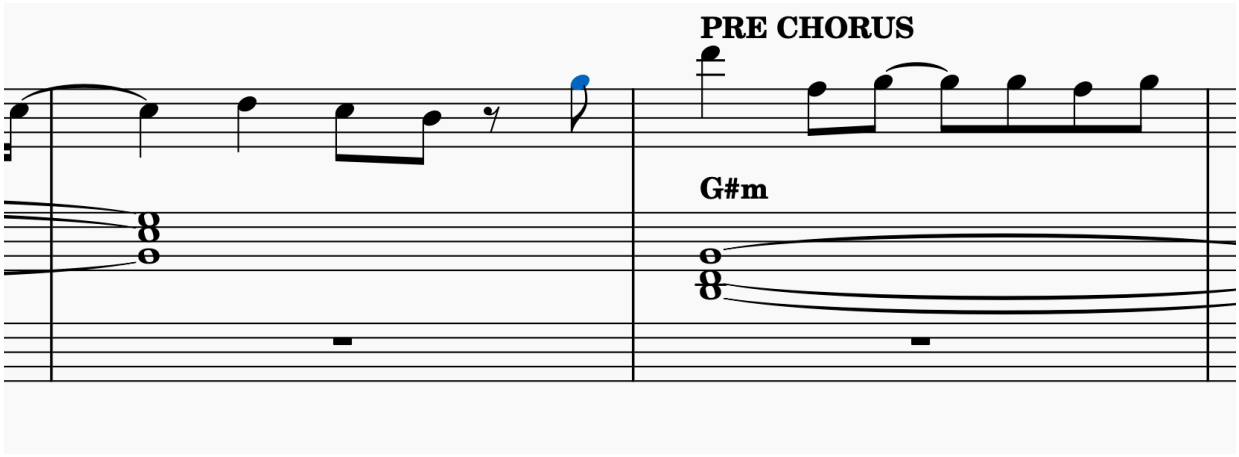
- The lowest percentage of completely consonant notes sung over chords in any of the songs analysed was 55.1%. The highest was 79.7%.
- The lowest percentage of partially consonant notes sung over chords in any of the songs analysed was 20.3%. The highest was 44.9%.
- The lowest percentage of completely consonant notes sung on the downbeat of a chord was 25%. The highest was 100%.
- The lowest percentage of partially consonant notes sung on the downbeat of a chord was 0%. The highest was 75%.
- No dissonant notes were sung during any of the choruses analysed.

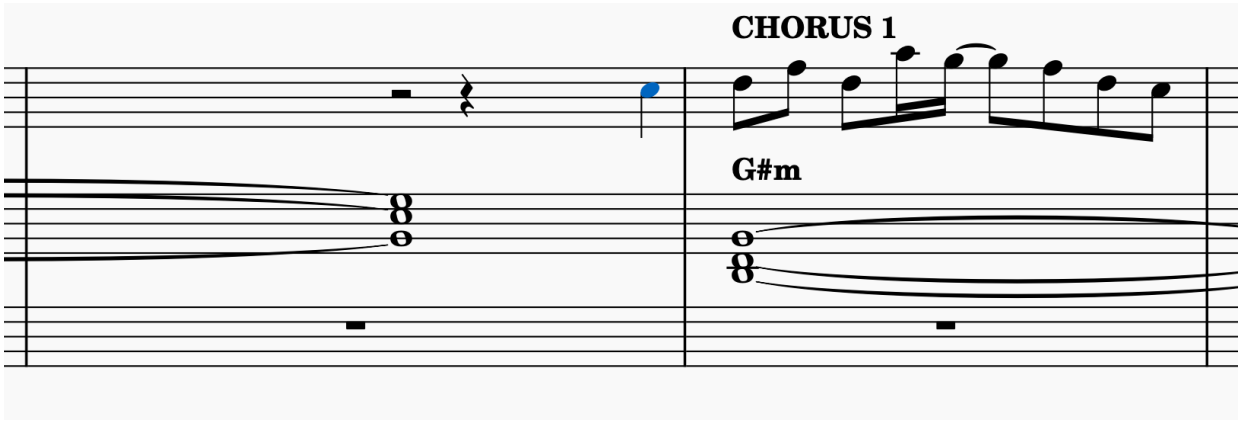
An observation made about this analysis is that songs that did not use dissonant notes and whose various uses of consonant notes remained in the ranges listed above had the highest chance of gaining commercial success in the years 2014 and 2015.

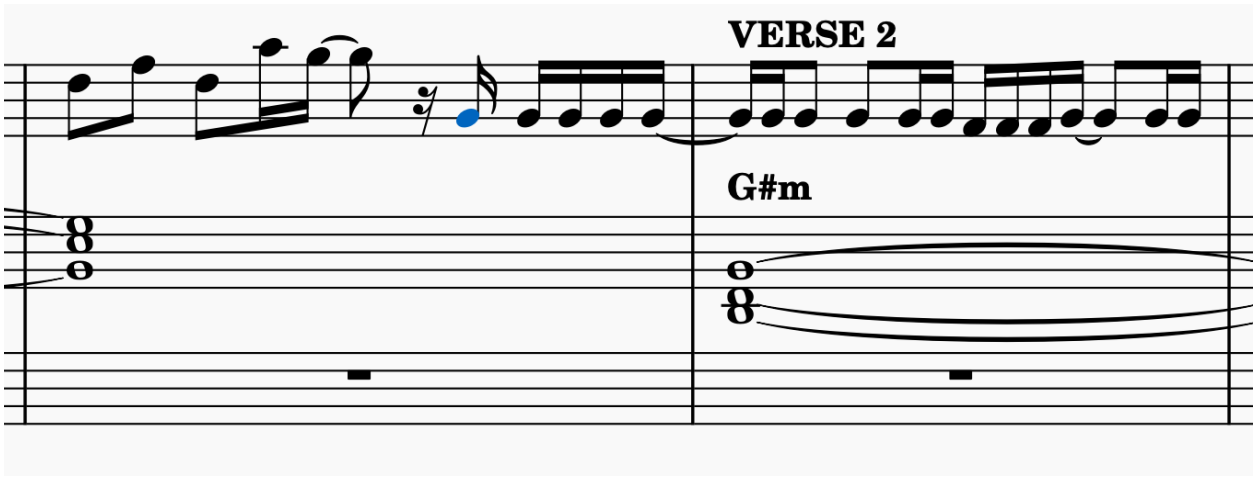
notes highlighted in blue or green are the first note of the vocal melody of each section titled in screen grabs

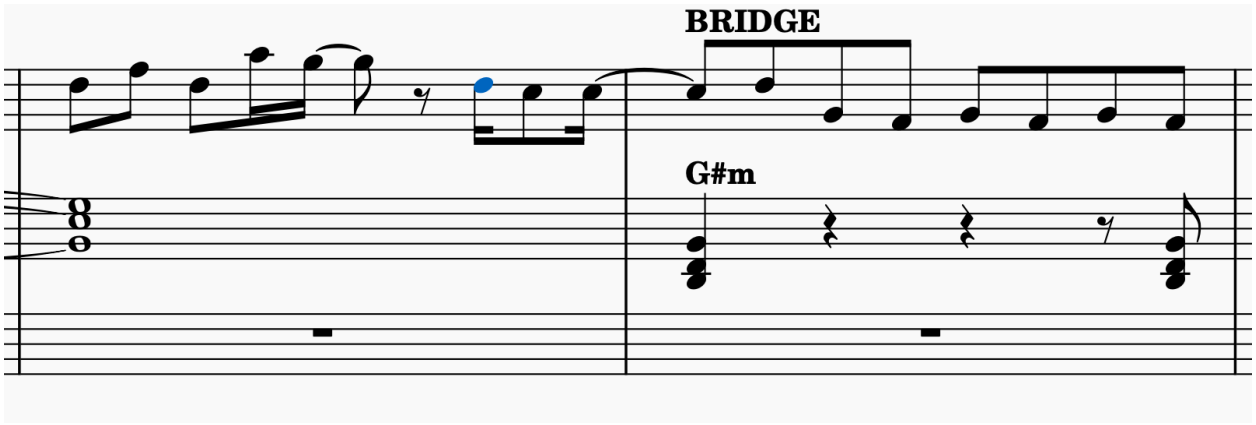
Sing - Ed Sheeran :



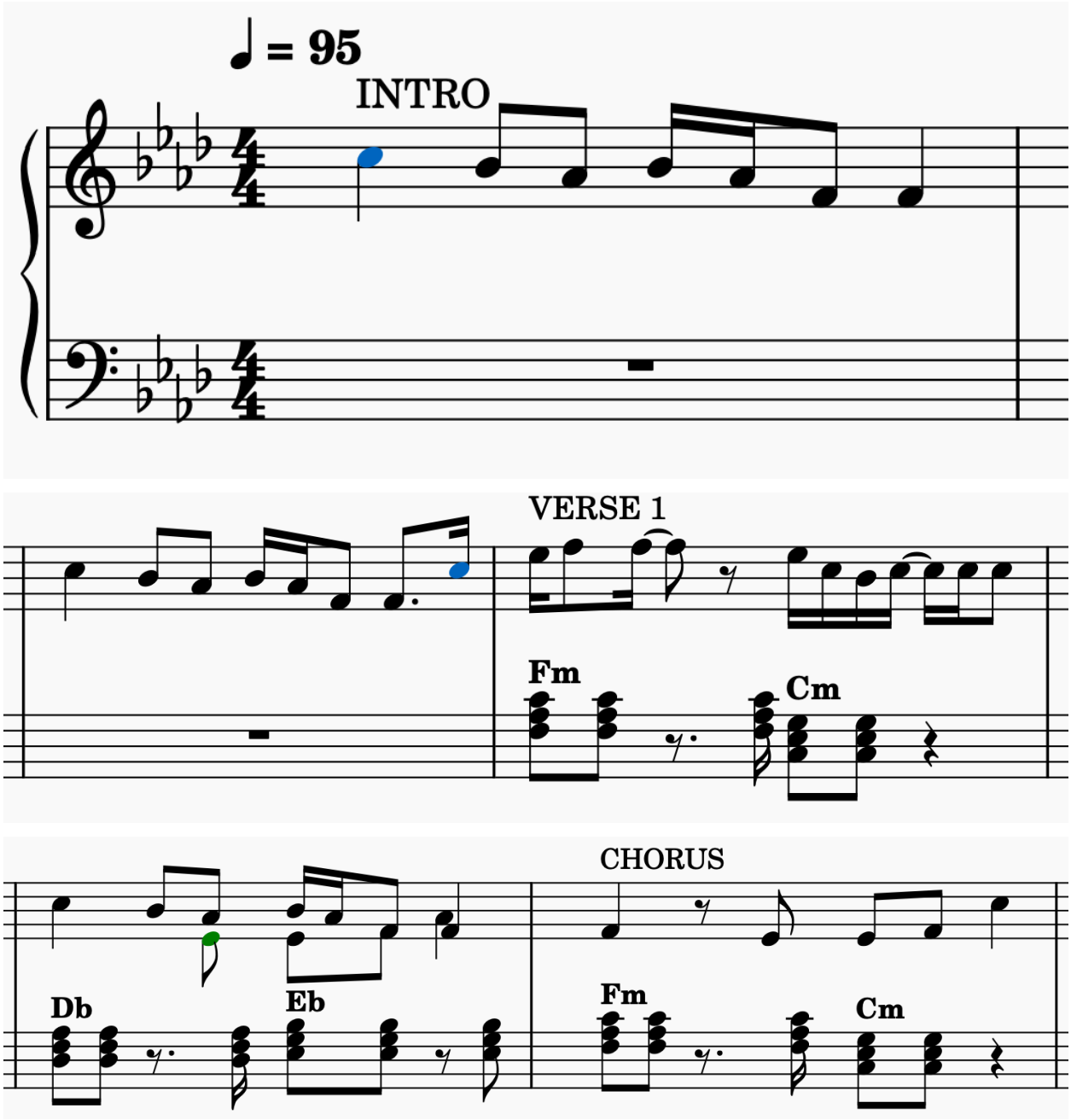




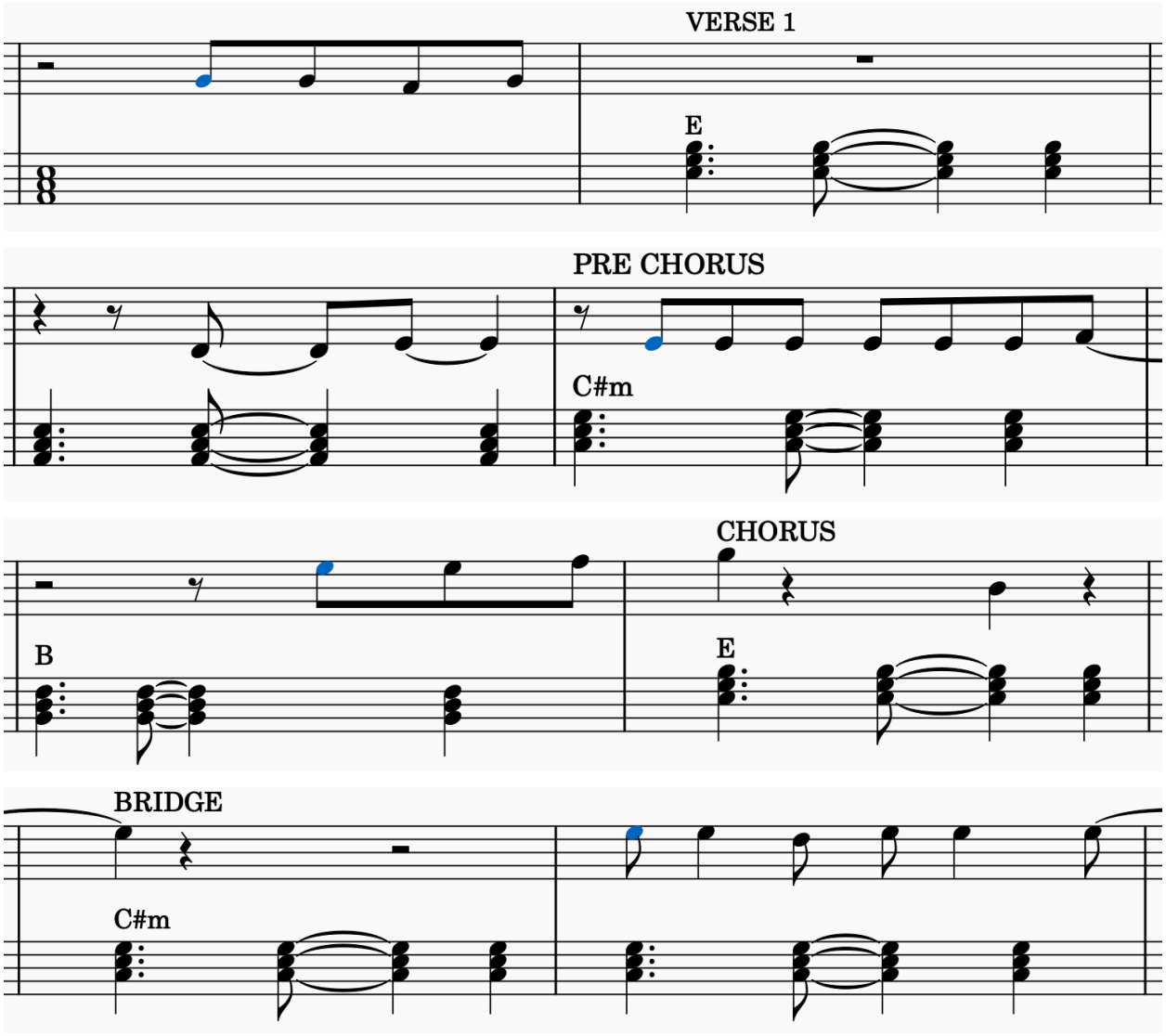

VERSE 2
G#m


BRIDGE
G#m

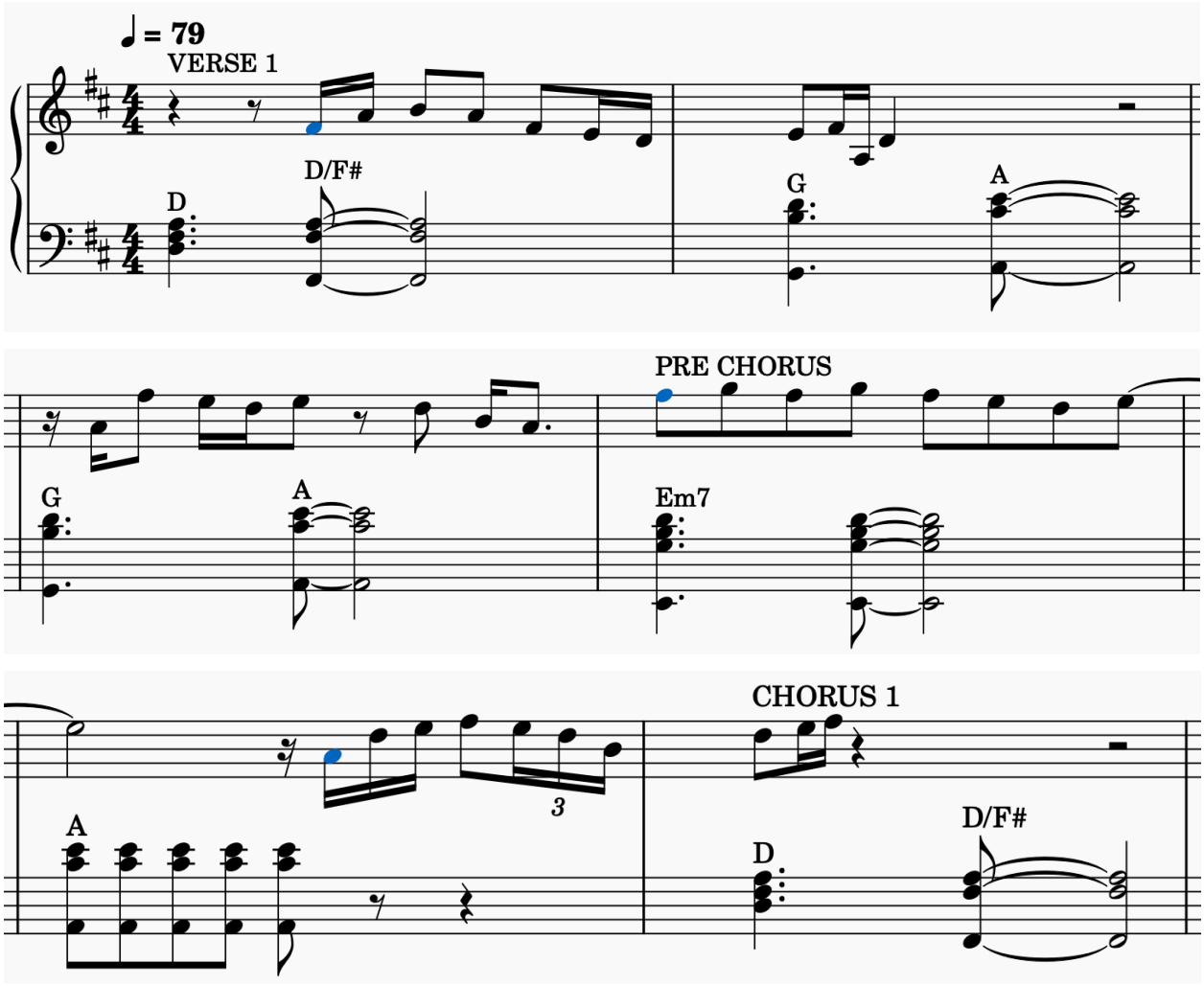
Don’t - Ed Sheeran :



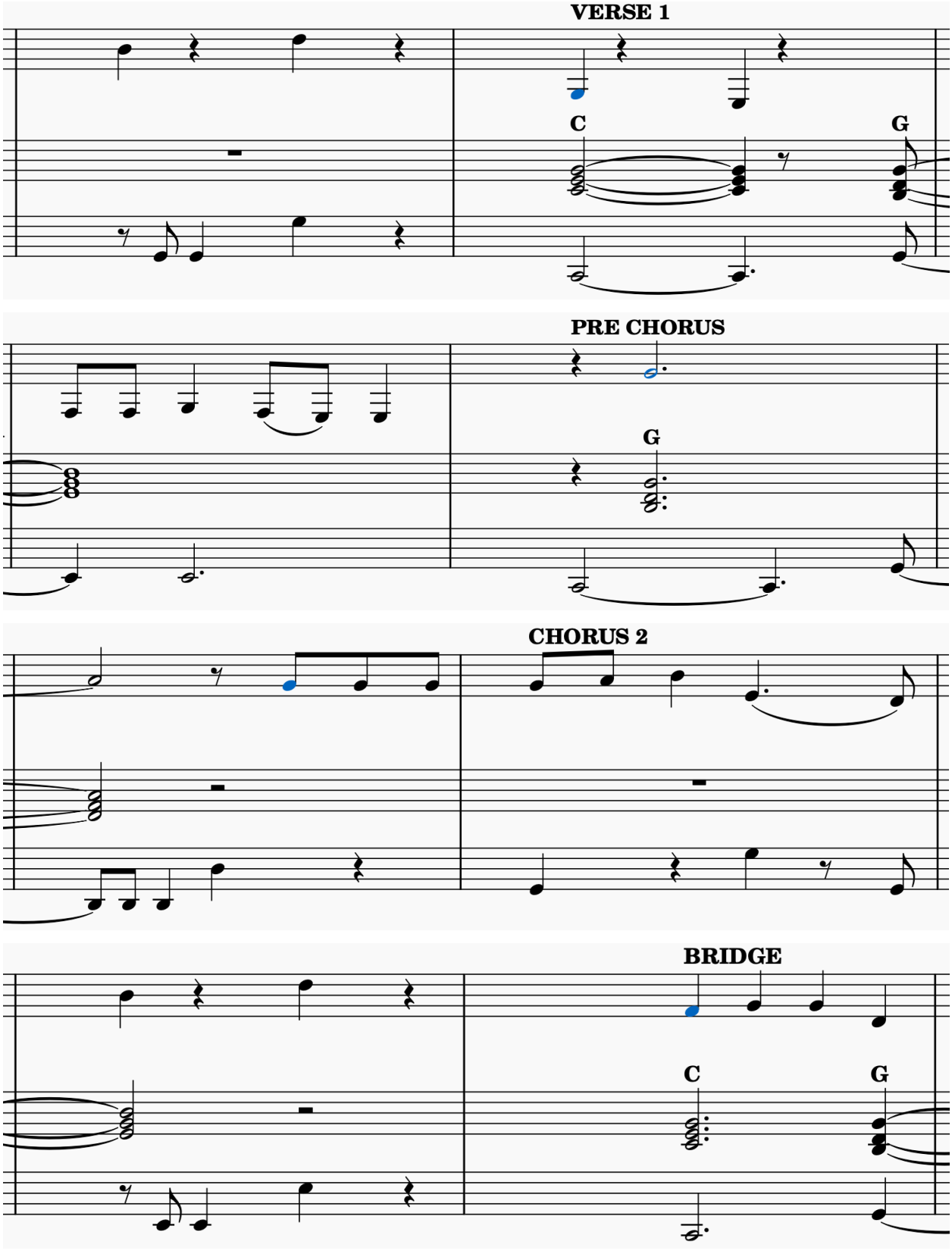
Photograph - Ed Sheeran :



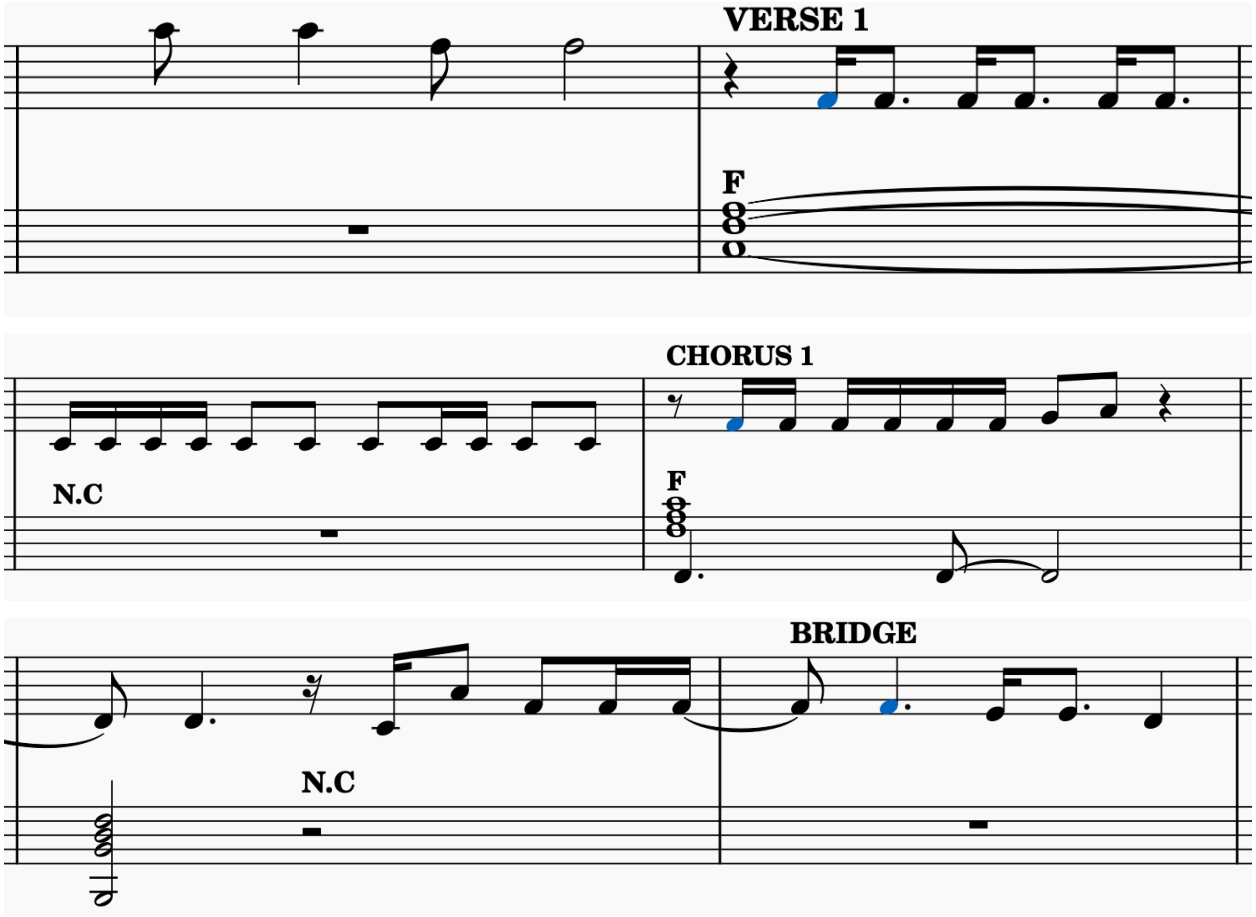
Thinking Out Loud - Ed Sheeran :



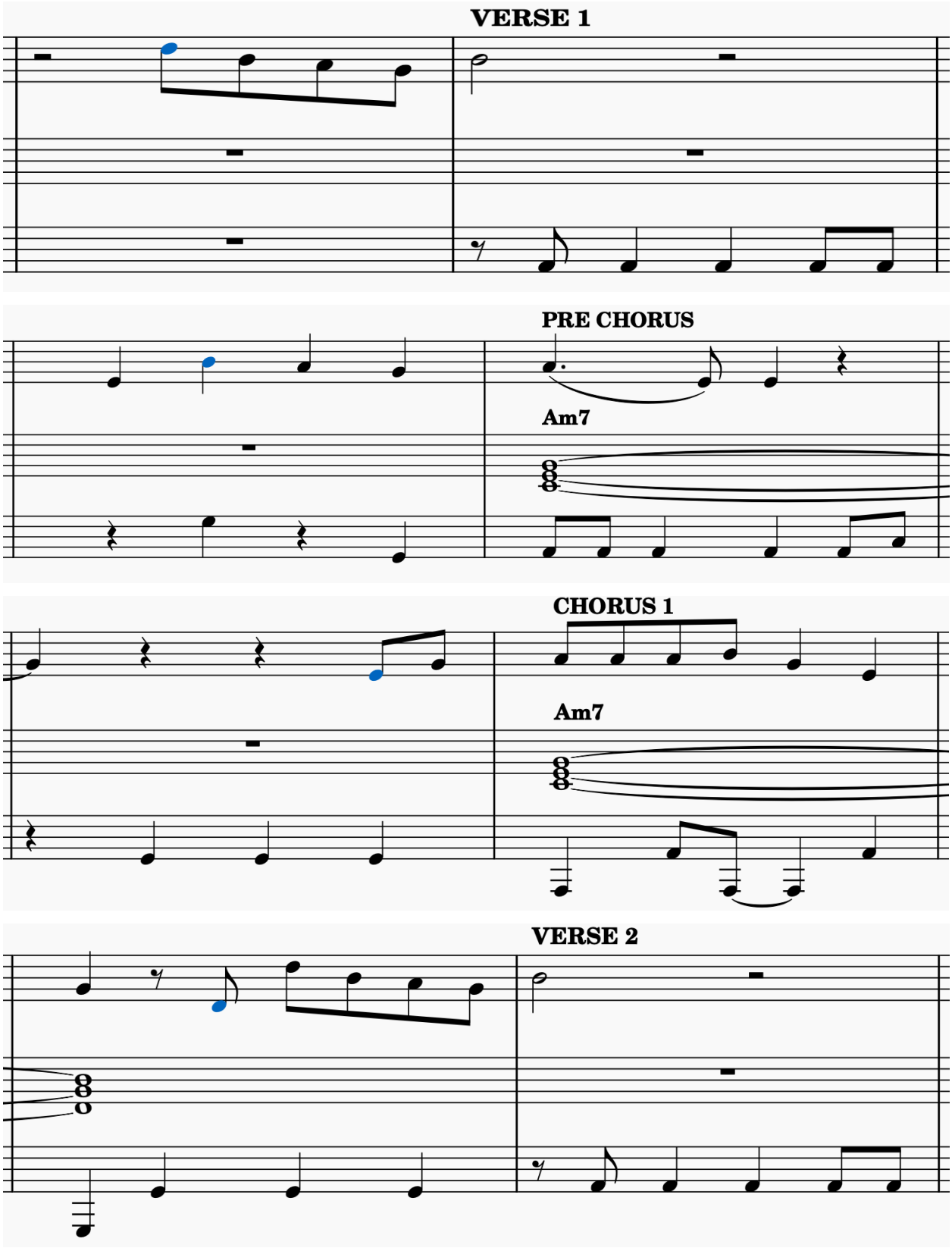
Bad Blood - Taylor Swift :

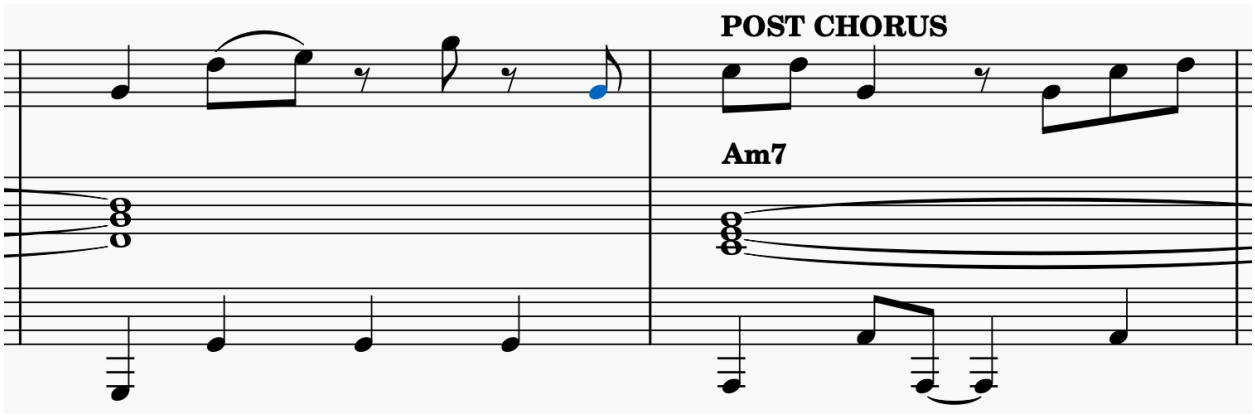


Blank Space - Taylor Swift :

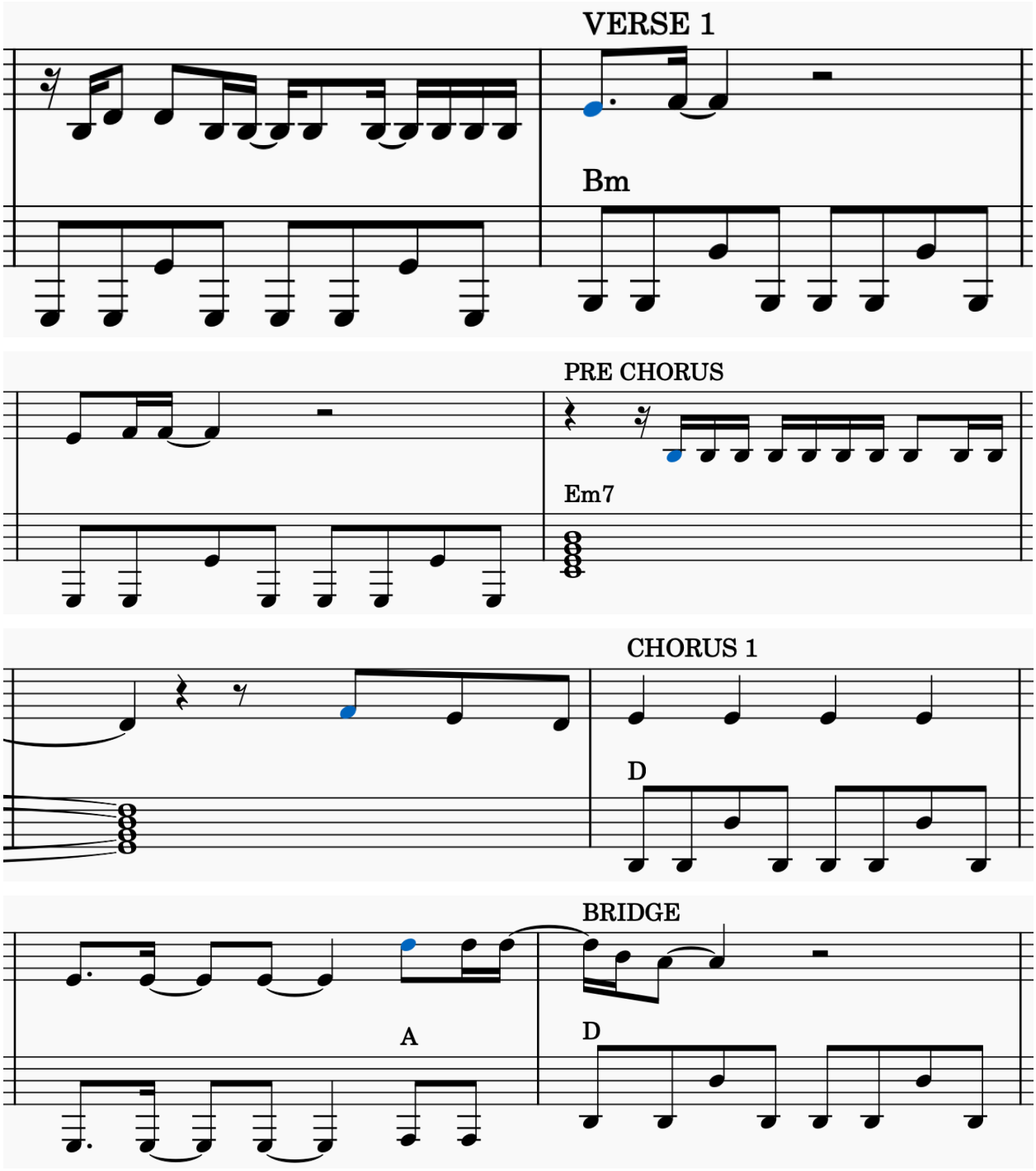


Shake It Off - Taylor Swift :

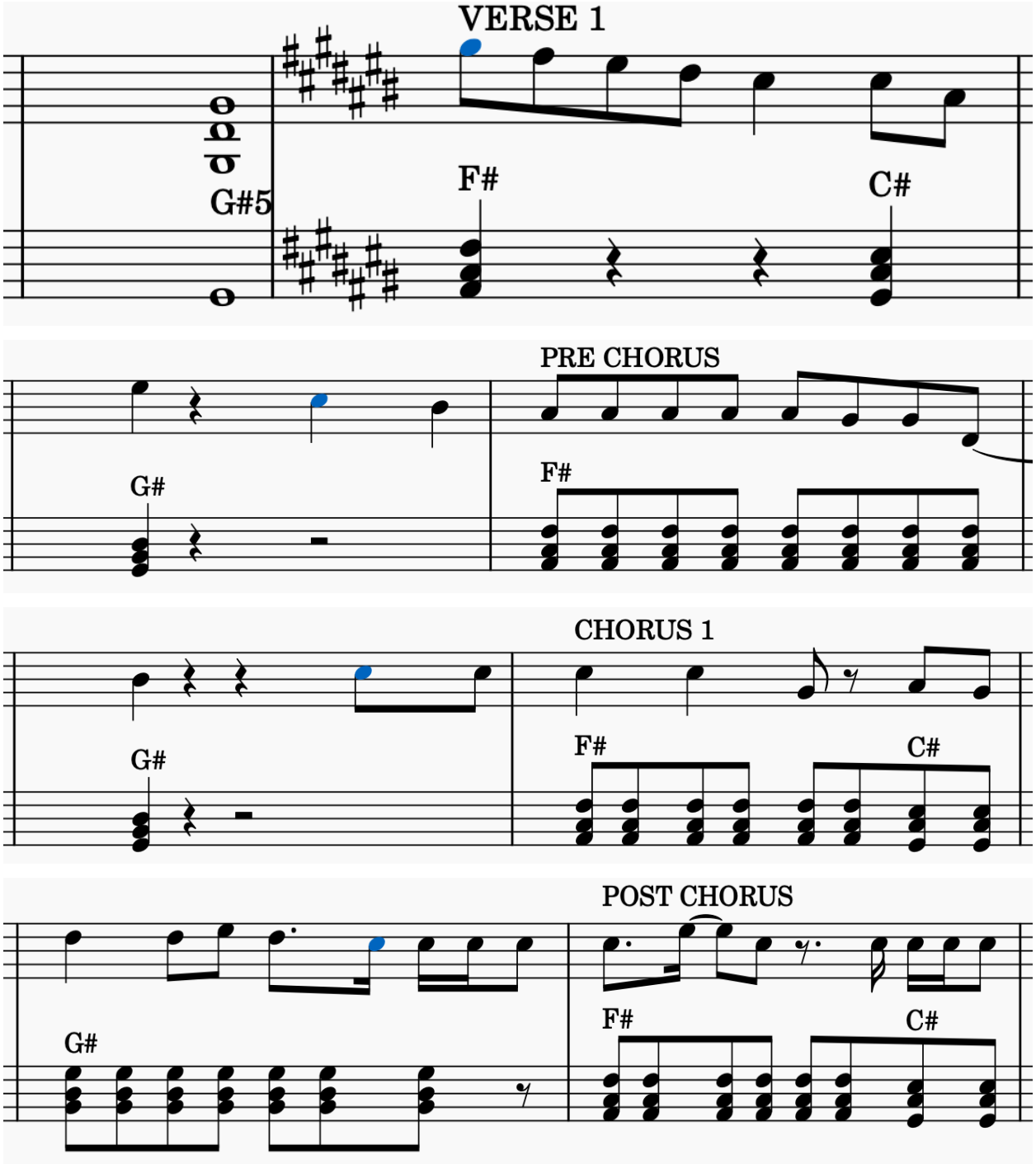


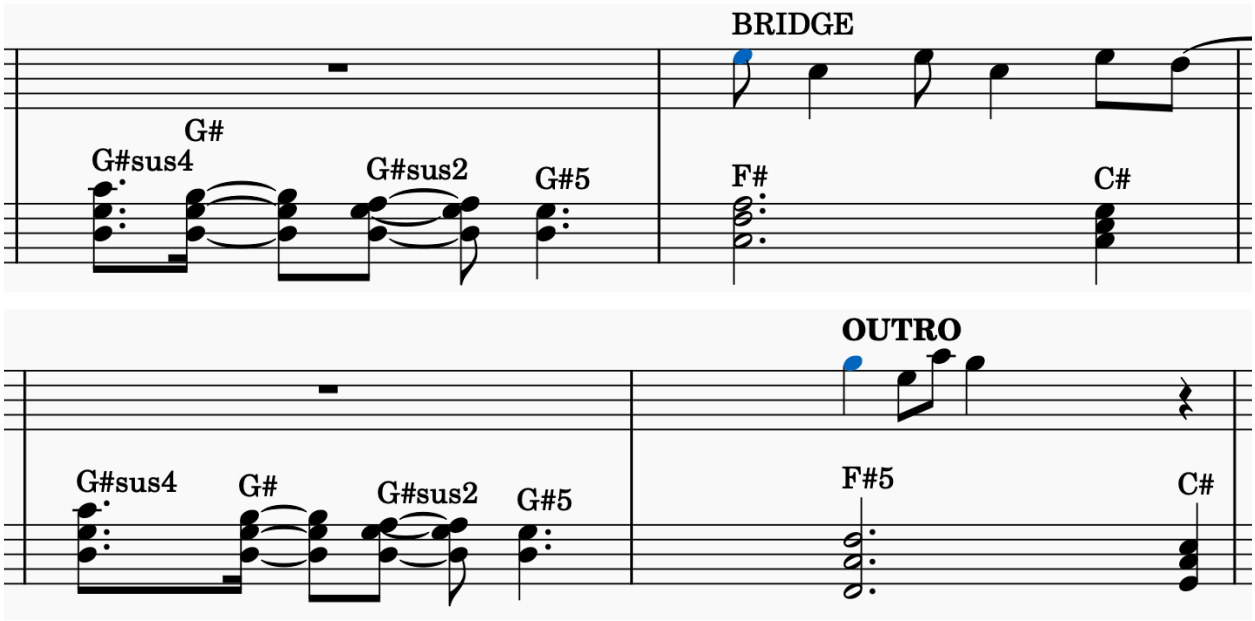

POST CHORUS
Am7

Style - Taylor Swift :



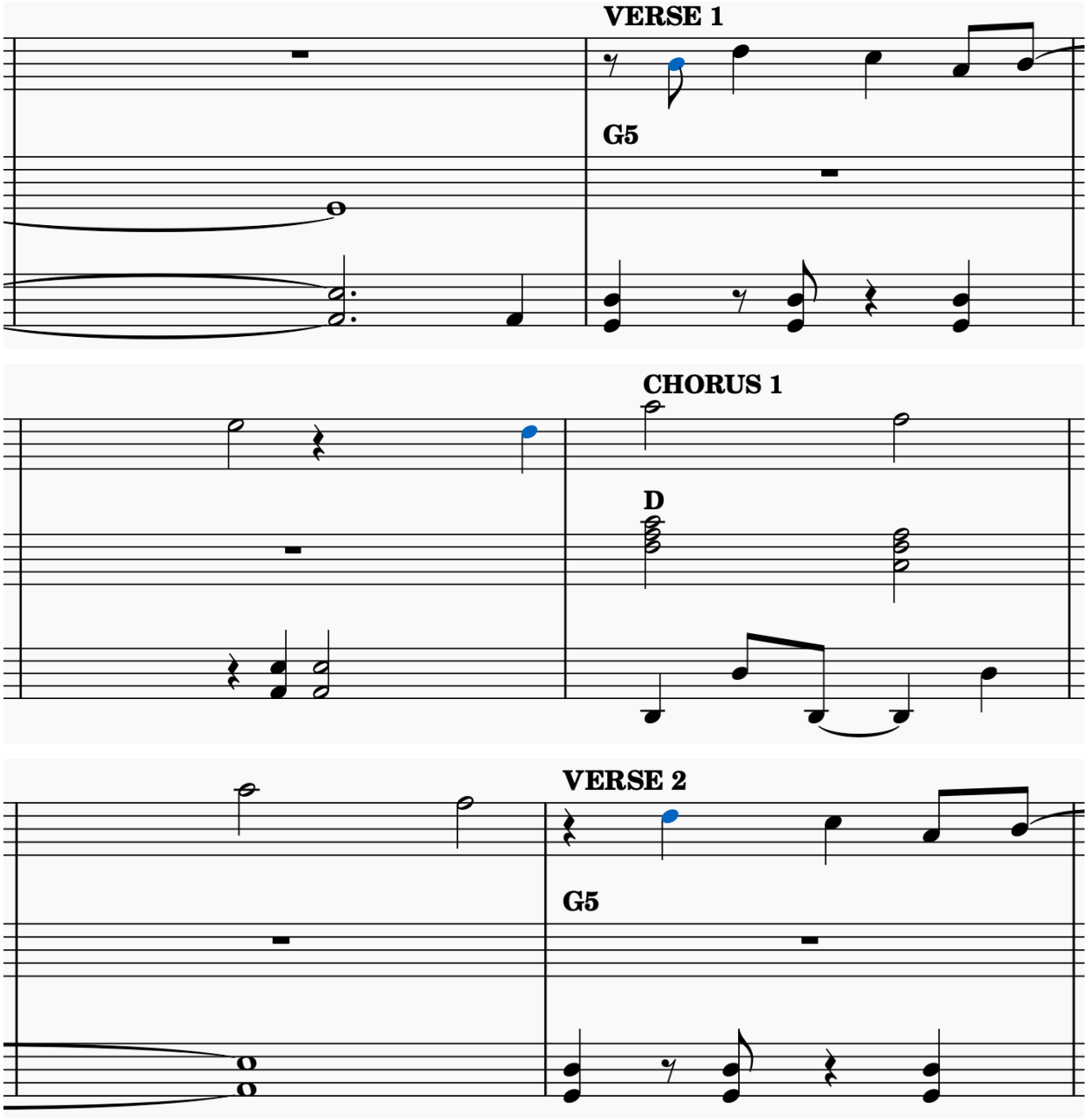
Best Song Ever - One Direction :

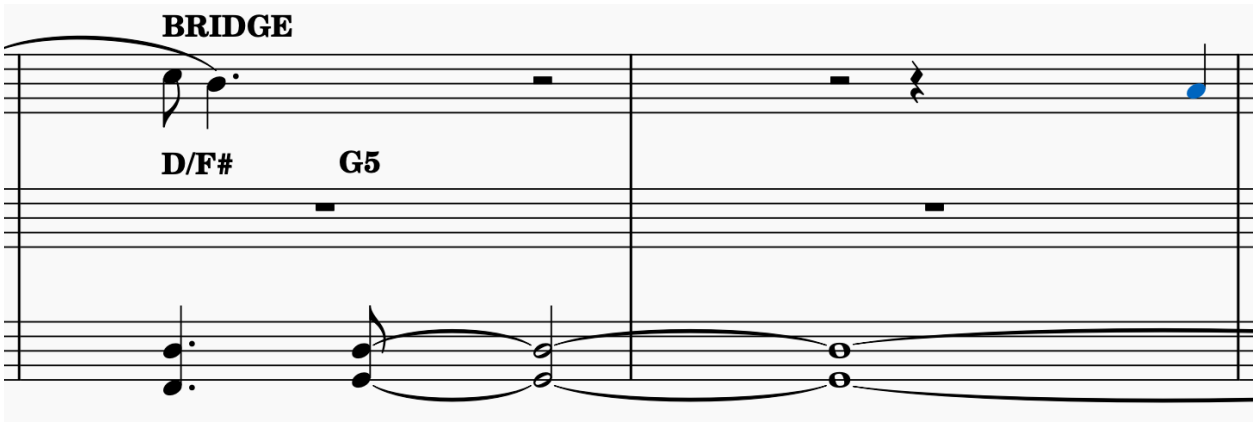


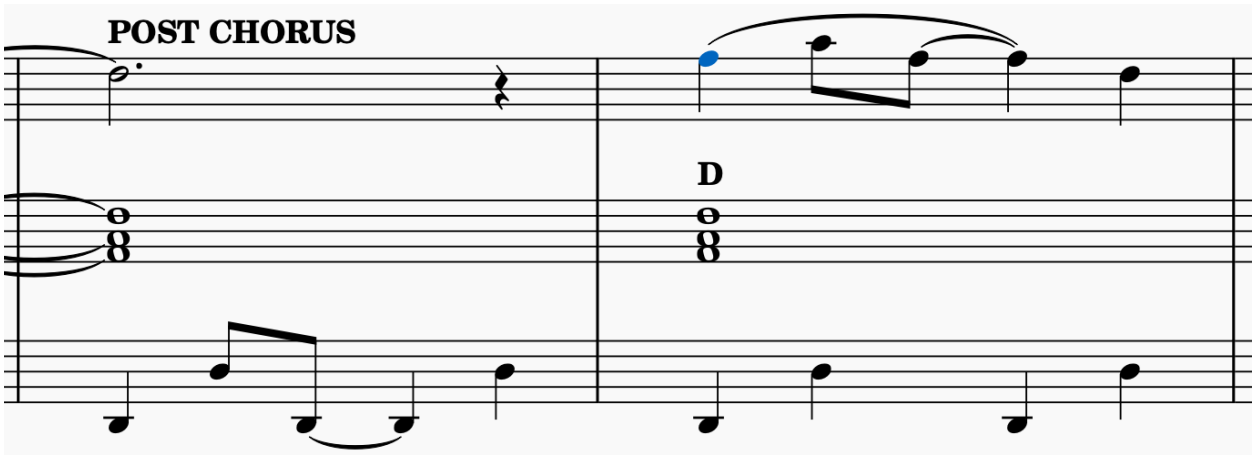

BRIDGE
G#
G#sus4
G#sus2
G#5
F#
C#

OUTRO
G#sus4
G#
G#sus2
G#5
F#5
C#

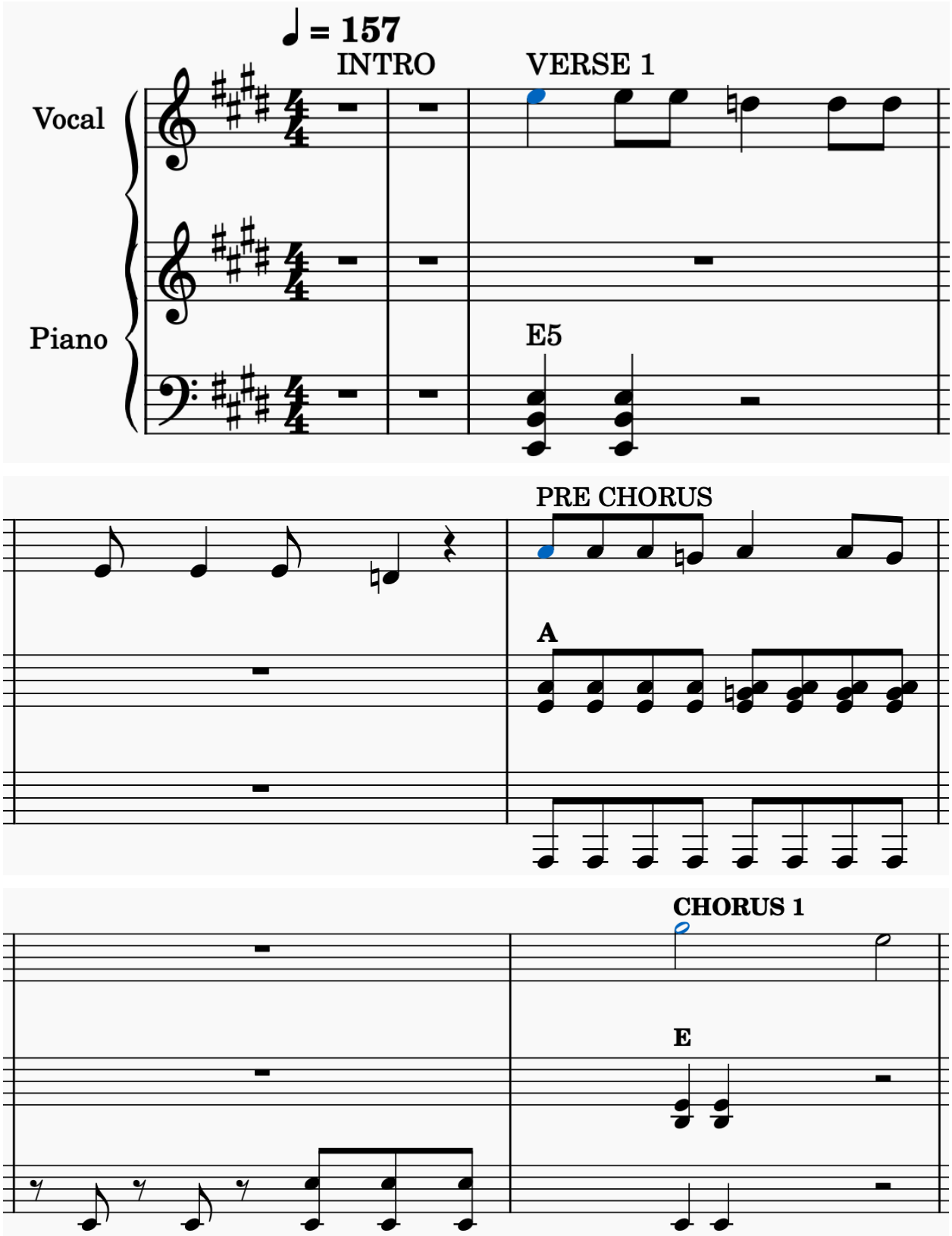
Diana - One Direction :

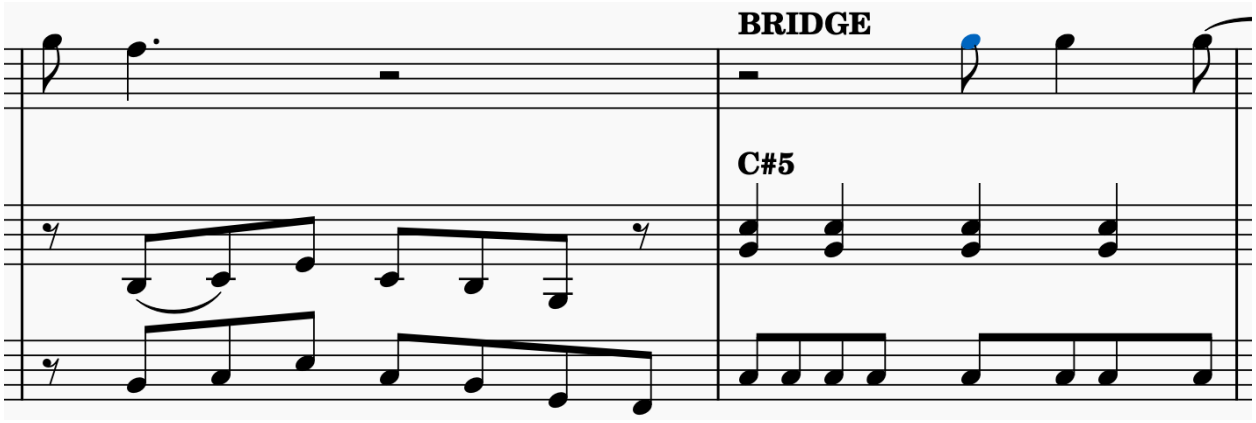



BRIDGE
D/F#
G5

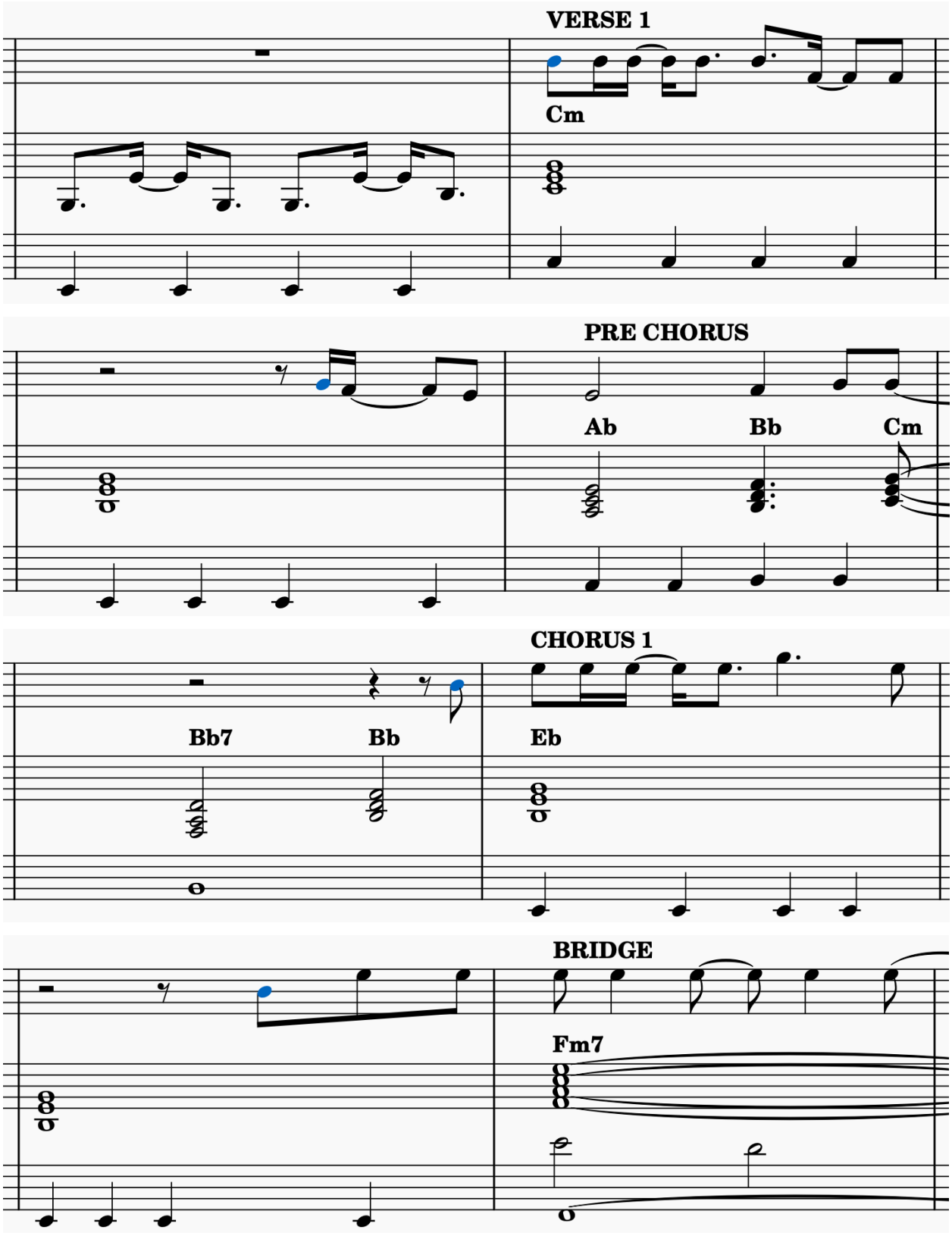

POST CHORUS
D

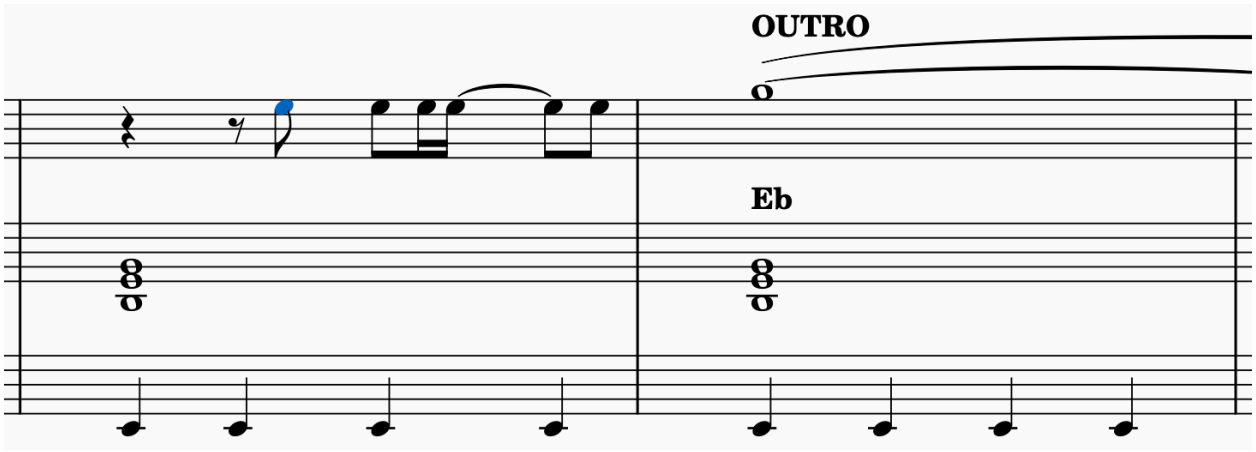
Midnight Memories - One Direction :




BRIDGE
C#5

Story Of My Life - One Direction :




OUTRO
Eb

Song	Intro	Verse	Pre Chorus	Chorus	Bridge	Outro	# of Sections Where Vocal Starts on the Same Beat as Another Section
Sing	-	Anacrusis	Anacrusis	Anacrusis	Anacrusis	-	0
Don't	On Downbeat	Anacrusis	-	Anacrusis	-	-	0
Photograph	-	Anacrusis	M.B.S	Anacrusis	On Downbeat	-	0
Thinking Out Loud	-	M.B.S	On Downbeat	Anacrusis	-	-	0
Bad Blood	-	On Downbeat	M.B.S	Anacrusis	On Downbeat	-	2
Blank Space	-	M.B.S	-	M.B.S	M.B.S	-	2
Shake It Off	-	Anacrusis	Anacrusis	Anacrusis	-	-	0
Style	-	On Downbeat	M.B.S	Anacrusis	Anacrusis	-	0
Best Song Ever	-	On Downbeat	Anacrusis	Anacrusis	On Downbeat	On Downbeat	3
Diana	-	M.B.S	-	Anacrusis	M.B.S	-	0
Midnight Memories	-	On Downbeat	On Downbeat	On Downbeat	M.B.S	-	3
Story of My Life	-	On Downbeat	Anacrusis	Anacrusis	M.B.S	Anacrusis	0

M.B.S = Missed Beat Syncopation

Fig. 17 - Data gathered on the timing of the first note of the lead vocal in each section on all twelve songs[15]

[15] See screen grabs from pages 40-57 to see how this data was compiled.

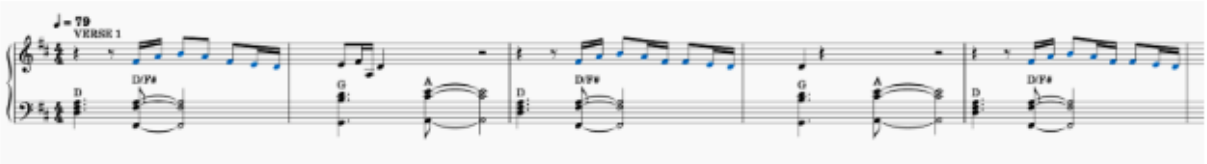
Analysis of data seen in fig. 17 is as follows :

- In 66.6% of the songs analysed, the timing of the first note of the lead vocal melody differed for each section of each song.
- In 16.6% of the songs analysed (two songs), the timing of the first note of the lead vocal melody was the same in two different sections. In both songs the bridge section contained the same timing of the first note of the lead vocal melody as another section.
- In 16.6% of the songs analysed, the timing of the first note of the lead vocal melody was the same in three different sections. In 50% of these songs the bridge section contained the same timing of the first note of the lead vocal melody as another section.
- In the forty-five sections of the twelve songs analysed an anacrusis[16] was used in the vocal melody twenty-one times (46.7%), missed beat syncopation[17] was used in the vocal melody eleven times (24.4%) and the vocal melody hit on the downbeat[18] thirteen times (28.9%).
- 83.3% of the songs analysed used an anacrusis in the vocal melody for the chorus sections.

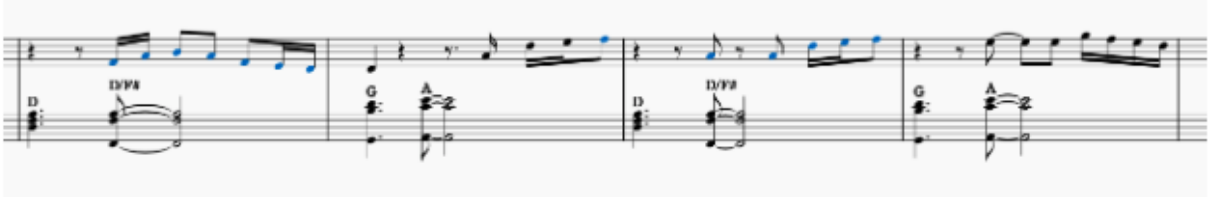
Observations made about this analysis are that songs that used an anacrusis in the vocal melody of their chorus and that varied the timing of the first note of the vocal melody on a section by section basis had the highest chance of gaining commercial success in the years 2014 and 2015.

[16] When a melody starts before the first beat of the first bar in a section.
[17] When a melody starts after the first beat of the first bar in a section.
[18] When a melody starts on the first beat of the first bar of a section.

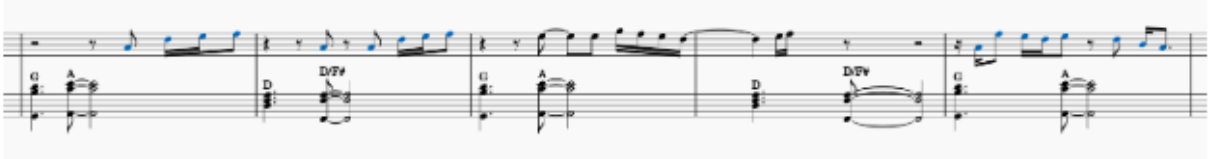
Thinking Out Loud - Ed Sheeran :



- Arc shape melodies highlighted in blue



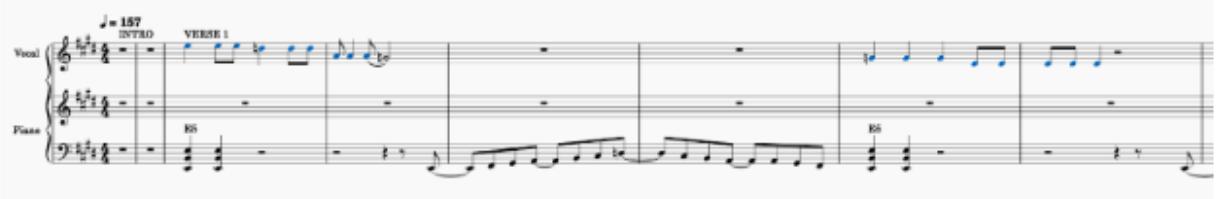
- Arcs and inverted arcs shape melodies highlighted in blue



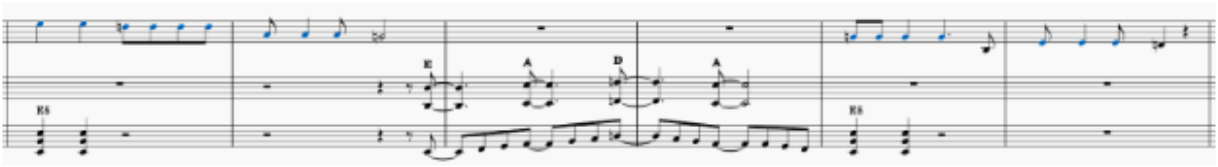
- Wavy and busy melody shapes highlighted in blue

Fig. 18 - Data gathered on the melody shapes found in the vocal melody of Ed Sheeran's 'Thinking Out Loud'.

Midnight Memories - One Direction :



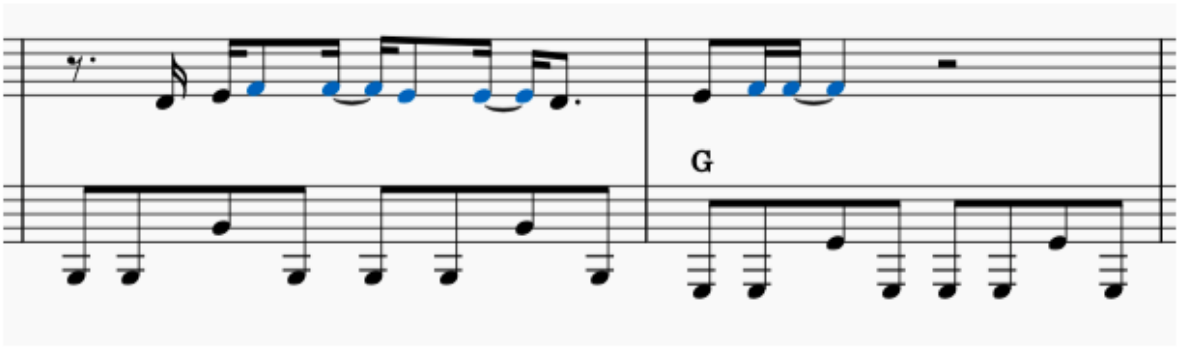
- Flatline descending melody shapes highlighted in blue



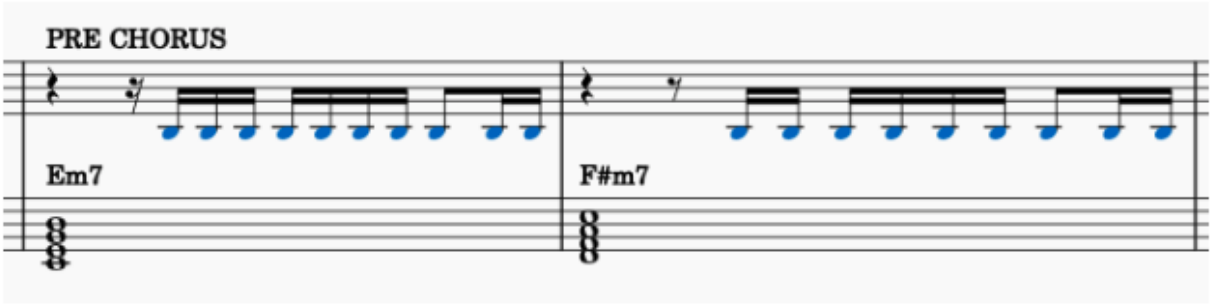
- Flatline descending melody shapes highlighted in blue

Fig. 19 - Data gathered on the melody shapes found in the vocal melody of One Direction's 'Midnight Memories'.

Style - Taylor Swift :



- Flatline descending melody shape highlighted in blue



- Extreme example of flatline melody shape highlighted in blue

Fig. 20 - Data gathered on the melody shapes found in the vocal melody of Taylor Swift's song 'Style'.

The final area that was looked at with regards to vocal analysis was melody shapes.[19] Various sections from one song from each artist were analysed with regards to melody shapes. Flatline melody shapes were seen regularly in the One Direction and Taylor Swift songs. Arc and inverted arc melody shapes were regularly seen in Sheeran's song. Both the One Direction and Taylor Swift songs that were analysed had far more varying elements used in the production of the songs compared to the Ed Sheeran song. An observation made from this analysis is that songs in which the intricacy of the melody shapes were directly proportional to the busyness of the production supporting them had the highest chance of gaining commercial success in the years 2014 and 2015.

[19] See fig. 18, 19 & 20.

Drums/Percussion

The next area of analysis work carried out on six of the twelve songs (two from each artist) was on the use of drums/percussion.

Song	Total # of Bars	Total # of Bars Containing Drums/Perc	% of Song with Drums/Perc
Don't - Ed Sheeran	85	80	94.1%
Thinking Out Loud - Ed Sheeran	91	80	87.9%
Shake It Off - Taylor Swift	144	136	94.4%
Blank Space - Taylor Swift	93	90	96.8%
Diana - One Direction	130	129	99.2%
Midnight Memories - One Direction	113	109	96.5%

Fig. 21 - Data gathered on the duration, in percentages, of the songs that contain drums/percussion elements.

Analysis of data seen in fig. 21 is as follows :

- Drums were featured in all of the songs analysed between 87.9% - 99.2% of the entire song durations.
- Both of the lowest percentages of drums featured in the two Ed Sheeran songs that were analysed. This is perhaps down to Ed relying on his acoustic guitar to take the place of drums/percussion instruments a lot of the time.

An observation made from this analysis is that songs that had drums/percussion feature in at least 87.9% of their entire duration had the highest chance of gaining commercial success in the years 2014 and 2015.

Production/Arrangement

Blank Space - Taylor Swift																	
	Intro	Verse 1				Verse 2				Chorus							
Bars	1/2	3/4	5/6	7/8	9/10	11/12	13/14	15/16	17/18	19/20	21/22	23/24	25/26	27/28	29/30	31/32	33/34
Lead Vox																	
Backing Vox																	
Adlibs																	
Synth Bell (Low)																	
Synth Bell (High)																	
Synth Bass																	
Ac.Gtr																	
Kick																	
Snare																	
Perc Loop (Vinyl Crackle)																	
Shaker																	
Tambo																	
Transition FX																	

Fig. 22 - Production/Arrangement Chart for ‘Blank Space’. Green = Playing / White = Not Playing

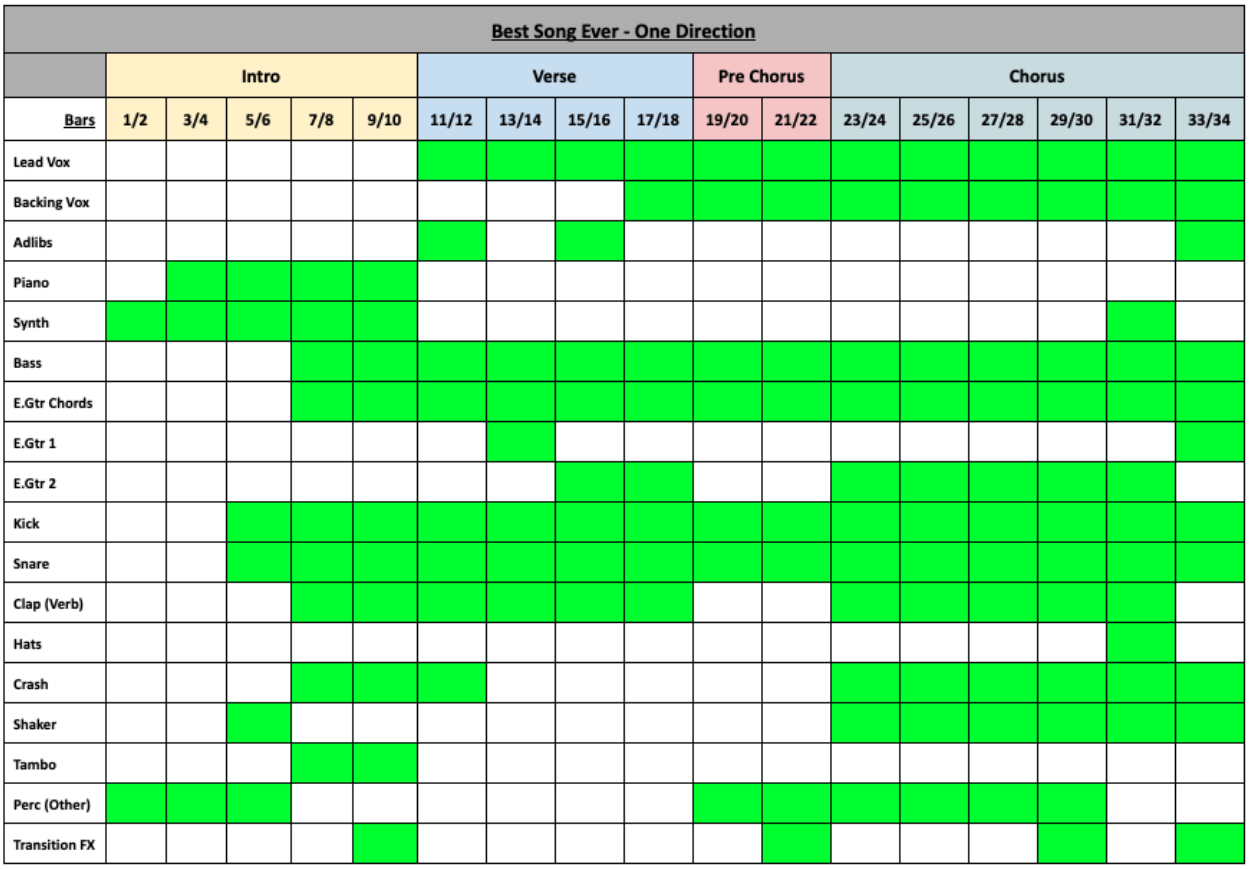


Fig. 23 - Production/Arrangement Chart for ‘Best Song Ever’. Green = Playing / White = Not Playing

Fig. 24 - Production/Arrangement Chart for ‘Thinking Out Loud’. Green = Playing / White = Not Playing

The final area of analysis work carried out on three of the songs was on production/arrangement. One song from each artist was analysed with regards to production/arrangement. All three songs were analysed up until the end of the first chorus section. The Taylor Swift song that was analysed had thirteen elements.[20] The largest period with no elements coming in or dropping out was six bars. Changes happened every 3rd bar in the chorus and every 5th bar or less elsewhere. The One Direction Song that was analysed had eighteen elements.[21] The largest period with no elements coming in or dropping out was six bars. Changes happened every 3rd bar elsewhere. The Ed Sheeran song that was analysed was very different to the other two.[22] It contained only eight elements and saw large durations without much changes in the production/elements coming and going. Eighteen bars was the longest duration without any new elements coming in or dropping out. The Ed Sheeran song relied on a much stronger vocal melody and delivery to keep the listener engaged as the lower frequency of changes in production put a greater emphasis on the vocal and lyrical meaning.

As a result of all of the observations made in this analysis chapter a set of guidelines, that if followed could have aided the process of writing a commercially successful song in the years 2014 and 2015 was compiled.[23] A pop song was then written while abiding by these guidelines.

In the following chapter of this research paper the project's design and success in relation to how well the research question was answered will be discussed.

[20] See fig. 22 for production/arrangement chart on ‘Blank Space’ - Taylor Swift.
[21] See fig. 23 for production/arrangement chart on ‘Best Song Ever’ - One Direction.
[22] See fig. 24 for production/arrangement chart on ‘Thinking Out Loud’ - Ed Sheeran.
[23] See Appendix D for the final proposed set of guidelines.

Discussion

This project looked at research and analysis within areas such as music theory, songwriting, arranging, audio engineering, production, mixing, critical listening and audio analysis. The main focus of the project was on the area of songwriting within the pop genre.

The project design was appropriate for answering the research question to a certain extent. The main aim of the project was to compile a set of guidelines that could have aided the process of writing a commercially successful pop hit in the years 2014 and 2015. The project achieved this aim but some of the resulting guidelines are quite broad. For example, the range of tempos from the songs analysed was 79-172bpm. Seeing as this is such a large range, one could hypothesise that tempo didn't play a big part in aiding a song's ability to achieve commercial success in 2014 and 2015. However the project in question believes this is not the case. Different styles of songs require different tempos. The project could have benefitted from narrowing the analysis down even further within the pop genre. Focusing on songs that were between a certain range of tempos (example : songs above 100bpm) instead of including much slower tempo songs, particularly Ed Sheeran's more ballad style songs, may have been a better approach. Including songs that had all kinds of different tempos may have affected the accuracy of analysis in other areas of the study such as any of the analysis work that had to do with durations.

A similar situation happened when analysing the keys of the songs. During this study it was found that pop songs written in major keys had the highest chance of gaining commercial success in 2014 and 2015. Out of the twelve songs analysed only two were written in minor keys. This meant that the project was left with a very small sample size representing pop songs that were written in minor keys. Certain areas of analysis such as the percentage breakdown of scale degree note usage for songs written in minor keys may not have been as accurate as it could have been had there been a bigger quantity of minor songs to analyse.

One issue the project ran into was time management. As it is evident, much of the analysis work carried out at the start of the project was done on all twelve songs. Some of this analysis work was extremely tedious and time consuming, such as the scoring out of all twelve songs or the counting of the various different scale degree notes used in each song. In the interest of time, as the project progressed, less songs and less sections of the songs were selected for the various different areas of analysis. Although analysis work was completed in all areas that the project aimed to complete, some areas of analysis resulted in more or less accurate findings due to the amount of songs included in the analysis.

Throughout the process of this project many skills were gained and improved upon. Each of the twelve songs chosen for analysis were scored out using the notation software Musescore 3. Through the process of scoring out the twelve songs, skills in areas such as audio analysis and scoring were improved. The project in question is now very comfortable at scoring out vocal melodies by ear. Previously the project in question would have had to work them out on a piano before attempting to score them.

Lots of new knowledge was discovered throughout the process of this project. The findings on the frequent use of an anacrusis in the vocal melodies of the choruses of the songs analysed was very interesting. Prior to the research carried out in this study, the project in question thought that using a chorus vocal melody that hit on the downbeat of a chorus would create the most impact. However using an anacrusis creates anticipation resulting in a much more impactful chorus that improves a section of a song's ability to stand out. The findings on the repetitive use of the pronouns ‘you’ and ‘I’ was also an interesting area of study. Having the word ‘you’ heavily repeated in the lyrics of a song makes the listener feel as if the song they’re listening to is about them. Having the word ‘I’ heavily repeated in the lyrics of a song makes anyone singing along to the song feel like they’re the person in the song. The idea of engaging someone singing along to the song is a crucial factor in helping a song to achieve commercial success.

As a result of this project the project in question is now left with a much deeper understanding of how pop music is constructed. Pop songs, as a rule, are heavily produced. Some pop songs track counts on certain sessions would be well into the hundreds. Although this project didn't focus a lot of its time on analysing the production side of pop music, it did focus its time on the most important thing. That is the song. Without a good song to start with the level of production on a track is irrelevant. In future projects involving the composition of pop music, the project in question has a clear set of guidelines that can aid in the process of writing a pop song. The project in question can be confident following these guidelines as the findings have been backed up by analysis work carried out in this study.

Conclusion

The project's aim was to study commercially successful pop songs from the years 2014 and 2015 and find out what traits they shared, if any. Extensive research and analysis was carried out in all areas set out by the project. The findings were then analysed and a set of guidelines that could have aided the process of writing a commercially successful pop song in 2014 and 2015 was compiled. The guidelines were then turned into a 'blueprint' in the form of a Prezi presentation to make them more accessible to a wider audience. The guidelines were then used by the project in question to craft a pop song.

If the project in question had more time every topic of analysis would have been carried out on all twelve songs. Also the production work on each song would have been interesting to look at in greater detail as it plays a big part in the creation of a commercially successful pop song.

Future development of this project could involve taking pop albums from different decades and studying them using an improved analysis process, similar to the one that was used in this study. For example, the project in question could take a look at the most commercially successful pop albums from the years 2010 and 2020 and analyse the differences in the findings. Perhaps a forecast for where pop music might be in the year 2025 could be compiled which could prove to be very useful to a lot of people in a variety of fields within the music industry.

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Appendix

A. Plays of Each Song on Spotify on 8/11/21

Midnight Memories - One Direction

Story of My Life -	715,750,155
You & I -	355,507,689
Best Song Ever -	339,337,807
Midnight Memories -	148,766,980
Strong -	121,686,227
Right Now -	118,961,016
Happily -	113,991,669
Diana -	101,175,414
Don't Forget Where You Belong -	80,387,218
Through The Dark -	68,242,613
Better Than Words -	66,466,454
Little White Lies -	62,556,933
Little Black Dress -	56,311,710
Something Great -	47,774,867

1989 - Taylor Swift

Shake It Off -	661,379,754
Blank Space -	647,141,597
Wildest Dreams -	430,662,424
Style -	273,492,376
Bad Blood -	239,467,877
Out Of The Woods -	139,365,768
Welcome To New York -	118,849,130
All You Had To Do Was Stay -	102,389,062
Clean -	76,256,504
How You Get The Girl -	67,664,267

I Know Places -	59,202,605
This Love -	57,013,511
I Wish You Would -	56,541,824

Multiply (x) - Ed Sheeran

Thinking Out Loud -	1,875,353,858
Photograph -	1,726,173,752
I See Fire -	793,462,189
Don’t -	605,589,278
Tenerife Sea -	505,326,523
Sing -	458,892,738
I’m A Mess -	289,106,738
Bloodstream -	260,034,649
One -	238,096,288
Afire Love -	155,025,241
Nina -	128,714,031
Runaway -	124,333,306
Take It Back -	106,218,622
Even My Dad Does Sometimes -	93,574,799
The Man -	90,727,499
Shirtsleeves -	84,141,437

B. US and UK Chart Positions

Midnight Memories - One Direction

Songs (in order of most plays on Spotify)	UK Peak Position	Weeks Spent in UK Charts	US Peak Position	Weeks Spent in US Charts
1. Story Of My Life	#2	29	#6	32
2. You & I	#19	10	#68	11
3. Best Song Ever	#2	28	#2	21
4. Midnight Memories	#39	13	#12	3
5. Strong	#48	1	#87	1
6. Right Now	-	-	-	-
7. Happily	-	-	-	-
8. Diana	#58	1	#11	1
9. Don't Forget Where You Belong	#21	1	-	-
10. Through The Dark	-	-	-	-
11. Better Than Words	-	-	-	-
12. Little White Lies	-	-	-	-
13. Little Black Dress	-	-	-	-
14. Something Great	-	-	-	-

UK stats taken from : https://www.officialcharts.com/artist/7132/one-direction/

US Stats taken from : http://musicchartsarchive.com/albums/one-direction/midnight-memories

1989 - Taylor Swift

Songs (in order of most plays on Spotify)	UK Peak Position	Weeks Spent in UK Charts	US Peak Position	Weeks Spent in US Charts
1. Shake It Off	#2	55	#1	50
2. Blank Space	#4	32	#1	36
3. Wildest Dreams	#40	12	#5	27
4. Style	#21	19	#6	32
5. Bad Blood	#4	16	#1	25
6. Out Of The Woods			#18	10
7. Welcome To New York	#39	2	#48	2
8. All You Had To Do Was Stay	-	-	-	-
9. Clean	-	-	-	-
10. How You Get The Girl	-	-	-	-
11. I Know Places	-	-	-	-
12. This Love	-	-	-	-
13. I Wish You Would	-	-	-	-

UK stats taken from : https://www.officialcharts.com/artist/5387/taylor-swift/
US stats taken from : http://musicchartsarchive.com/albums/taylor-swift/1989

Multiply (X) - Ed Sheeran

Songs (in order of most plays on Spotify)	UK Peak Position	Weeks Spent in UK Charts	US Peak Position	Weeks Spent in US Charts
1. Thinking Out Loud	#1	119	#2	58
2. Photograph	#15	92	#10	30
3. I See Fire	#13	66		
4. Don't	#8	48	#9	36
5. Tenerife Sea	#62	7		
6. Sing	#1	54	#13	20
7. I'm A Mess	#49	12	-	-
8. Bloodstream	#2	45	-	-
9. One	#18	20	#87	1
10. Afire Love	#59	4	#37	1
11. Nina	#57	7	-	-
12. Runaway	#71	3	-	-
13. Take It Back	#85	1	-	-
14. Even My Dad Does Sometimes	-	-	-	-
15. The Man	#82	3	-	-
16. Shirtsleeves	-	-	-	

UK stats taken from : https://www.officialcharts.com/artist/6692/ed-sheeran/
US stats taken from : http://musicchartsarchive.com/albums/ed-sheeran/x

C. Structure Analysis

Sing :	Intro	(4 bars)
	Verse 1	(16 bars)
	Pre Chorus	(16 bars)
	Chorus	(8 bars)
	Verse 2	(16 bars)
	Pre Chorus	(16 bars)
	Chorus 2	(8 bars)
	Bridge	(16 bars)
	Double Chorus	(16 bars)
Don't :	Intro	(5 bars)
	Verse 1	(16 bars)
	Chorus 1	(8 bars)
	Verse 2	(16 bars)
	Chorus 2	(8 bars)
	Verse 3	(16 bars)
	Double Chorus	(16 bars)
Photograph :	Intro	(8 bars)
	Verse 1	(16 bars)
	Pre Chorus	(8 bars)
	Half Chorus	(8 bars)
	Break	(2 bars)
	Verse 2	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 2	(16 bars)
	Bridge	(8 bars)
	Chorus 3	(16 bars)
	Outro	(8 bars)

Thinking Out Loud :	Verse 1	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 1	(10 bars)
	Verse 2	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 2	(10 bars)
	Solo/Bridge	(8 bars)
	Chorus 3	(10 bars)
	Chorus Outro	(5 bars)
Blank Space :	Intro	(2 bars)
	Verse 1	(16 bars)
	Chorus 1	(16 bars)
	Break	(2 bars)
	Verse 2	(16 bars)
	Chorus 2	(16 bars)
	Bridge	(8 bars)
	Chorus 3	(16 bars)
Style :	Intro	(8 bars)
	Verse 1	(12 bars)
	Pre Chorus	(4 bars)
	Chorus 1	(16 bars)
	Verse 2	(12 bars)
	Pre Chorus	(4 bars)
	Chorus 2	(16 bars)
	Bridge	(8 bars)
	Half Chorus	(8 bars)

Shake It Off :	Intro	(4 bars)
	Verse 1	(16 bars)
	Pre Chorus	(8 bars)
	Chorus	(16 bars)
	Verse 2	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 2	(16 bars)
	Post Chorus	(8 bars)
	Interlude	(8 bars)
	Bridge	(10 bars)
	Chorus 3	(16 bars)
	Double Post Chorus	(16 bars)
Bad Blood :	Chorus 1	(16 bars)
	Verse 1	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 2	(16 bars)
	Verse 2	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 3	(16 bars)
	Bridge	(18 bars)
	Double Chorus	(32 bars)
Best Song Ever :	Intro	(10 bars)
	Verse 1	(8 bars)
	Pre Chorus	(4 bars)
	Chorus 1	(8 bars)
	Post Chorus	(4 bars)
	Verse 2	(8 bars)
	Pre Chorus	(4 bars)
	Chorus 2	(8 bars)
	Post Chorus	(4 bars)
	Bridge	(12 bars)
	Double Chorus	(16 bars)
	Post Chorus	(4 bars)
	Outro	(8 Bars)

Story Of My Life :	Intro	(8 bars)
	Verse 1	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 1	(16 bars)
	Verse 2	(16 bars)
	Pre Chorus	(8 bars)
	Chorus 2	(16 bars)
	Bridge	(8 bars)
	Breakdown	(8 bars)
	Chorus 3	(8 bars)
	Outro	(10 bars)
Diana :	Intro	(10 bars)
	Verse 1	(16 bars)
	Chorus 1	(16 bars)
	Break	(4 bars)
	Verse 2	(16 bars)
	Chorus 2	(16 bars)
	Bridge	(16 bars)
	Chorus 3	(16 bars)
	Post Chorus	(16 bars)
	Outro	(4 bars)
Midnight Memories :	Intro	(2 bars)
	Verse 1	(14 bars)
	Pre Chorus	(8 bars)
	Chorus 1	(16 bars)
	Verse 2	(14 bars)
	Pre Chorus	(8 bars)
	Chorus 2	(16 bars)
	Bridge	(18 bars)
	Chorus 3	(16 bars)
	Outro	(1 bar)

D. Proposed set of guidelines, that if followed could have aided the process of writing a commercially successful song in the years 2014 and 2015.

Based on all information gathered throughout the research and analysis phase of this project, here is the proposed set of guidelines for writing pop songs that would have given a song the highest chance of commercial success during the years 2014 and 2015.

Tempos, Time Signatures and Keys :

- Songs should be written in a 4/4 time signature.
- Song tempo should be at least 95 bpm and no more than 172 bpm.
- Deviations in tempo should be avoided.
- Songs can be written in either a major or minor key but have a higher chance of commercial success if written in a major key.
- Modes other than ionian or aeolian should be avoided.
- Key changes within a song should be avoided.

Structure :

- Songs should be between three and four minutes in length.
- Songs should contain an intro and should last no more than 10% of the total duration of the entire song.
- Songs should contain a verse and it should last sixteen bars.
- Songs should contain a pre chorus and it should last eight bars.
- Songs should contain a chorus and it should last sixteen bars.
- The chorus should be heard within the first 30% of the song's entire duration.
- Songs should contain a bridge and it should last eight bars.
- Songs can contain an outro and it should last no more than ten bars.
- Song structures/forms other than : Intro - Verse - Pre Chorus - Chorus - Bridge, should be avoided.

Chords :

- Songs should use at least two different chords but avoid using more than five.
- Songs written in a major key should contain the I, IV, V and vi chords and can contain the ii and iii chords.
- Songs written in a major key should avoid using the vii° chord.
- Songs written in a minor key should contain the i chord and can contain the iv, v, VI and VII chords.
- Songs written in a minor key should avoid using the III or the ii° chord.
- Borrowed chords should be avoided.

Lyrics :

- Song lyrics should contain between 274-601 words.
- Songs should contain the title of the song in its lyrics.
- The title should be repeated at least once during the song.
- Songs should contain the lyrics “you” and “I” and they should be used throughout.
- The words “you” or “I” should be heard within the first 35 seconds of a song.
- The amount of three or more syllable words used in a song should not exceed 6.5% of the total number of words used.
- The amount of two syllable words used in a song should not exceed 18.1% of the total number of words used.
- The amount of one syllable words used in a song should not exceed 91.4% of the total number of words used.

Vocals :

- Vocals should be heard between 63.1% - 91.5% of the total duration of a song.
- The amount of notes sung in a song should be between 376 and 668 notes.
- Sung notes lower, in pitch, than E3 should be avoided.
- Sung notes higher, in pitch, than D#6 should be avoided.
- The range of notes used in the vocal melodies of a song should be between 14 - 24 semitones.
- The range of notes used in the vocal melodies of a verse should not exceed 12 semitones.
- The range of notes used in the vocal melodies of a pre chorus should not exceed 10 semitones.
- The range of notes used in the vocal melodies of a chorus section should not exceed 12 semitones.
- The range of notes used in the vocal melodies of a bridge section should not exceed 12 semitones.
- The highest sung note in the vocal melody of a song should be saved for either a chorus or a bridge section.
- The maximum amount of completely consonant notes sung in a chorus section should be no greater than 79.7% of the total amount of sung notes.
- The maximum amount of partially consonant notes sung in a chorus section should be no greater than 44.9% of the total amount of sung notes.
- Dissonance in the song's vocal melody should be avoided.
- The timing of the first note of the lead vocal melody should be different for each intro, verse, pre chorus and chorus section of a song.
- The timing of the first note of the lead vocal melody in the bridge section of a song can be the same as one other section of the song.
- An anacrusis should be used in the vocal melody for the chorus section of a song.
- The intricacy of melody shapes used in a song should be directly proportional to the busyness of the production supporting them.

For songs written in major keys :

- The first scale degree note should be used most frequently.
- The second most frequently used note should be the 3rd scale degree.
- The third most frequently used note should be the 2nd scale degree.
- The fourth most frequently used note should be the 5th scale degree.
- The 4th scale degree note should not make up more than 9.7% of the total amount of notes used.
- The 6th scale degree note should not make up more than 11.1% of the total amount of notes used.
- The 7th scale degree note should not make up more than 12.6% of the total amount of notes used.

For songs written in minor keys :

- The 1st scale degree note should be used most frequently.
- The second most frequently used note should be the 5th scale degree.
- The third most frequently used note should be the 3rd scale degree.
- The fourth most frequently used note should be the 7th scale degree.
- The 4th scale degree note should not make up more than 13.5% of the total amount of notes used.
- The 2nd scale degree note should not make up more than 6.1% of the total amount of notes used.
- The 6th scale degree note should not make up more than 0.4% of the total amount of notes used.

Drums/Percussion :

- Drums/percussion should feature in a song.
- Drums/percussion should feature during at least 87.9% of the entire duration of a song.

Production/Arrangement :

- Songs should be recorded to a click and edited very tightly to the grid.
- The longest period of a song without any changes in relation to elements being introduced or dropping out should be no longer than 6 bars long. This should only happen once in a song.
- Some sort of changes with regards to elements being introduced or dropping out should happen every 3rd bar elsewhere.
- A lower frequency of changes in the production of a song puts a much greater emphasis on the vocal and lyrical content. If you want to get away with less frequent changes in the arrangement/production of a song you must make sure to have an emotionally engaging vocal performance matched with a very relatable and honest feeling lyric.