

The role of emotion in AAVE pronunciation: Mumble Rap as a phenomenon of Language Evolution

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Abstract

This study will focus on the effect of emotion on pronunciation in the specific case of Mumble Rap, a relatively new phenomenon in rap music introduced by speakers of African American Vernacular English (AAVE). It is hypothesised that mumble rapping is the result of emotion in speech and hence intonation, pitch range, and enunciation energy are higher in Mumble Rap tracks than in Lyrical Rap tracks. Five tracks of both styles are transcribed and analysed by measuring the vocal parameters using *Praat* computer software. A significant difference in pitch levels as well as pronunciation accuracy between the two rap styles provide evidence to suggest that speech in Mumble Rap is more emotional than Lyrical Rap. This provides insight into the development of AAVE as a variety of standard American English (AmE).

Key words: emotion, pronunciation, AAVE, rap music, voice quality

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1. Introduction

The unintelligible pronunciation of lyrics in music is no new phenomenon. Jimi Hendrix sang that he “kissed the sky” in his famous *Purple Haze* (Hendrix, 1970), but more than one fan was convinced that he said “kissed the guy” instead. As he mumbled the words people failed to agree on what Hendrix actually sang. Since the 2010s several American rappers, specifically from the South Eastern States, started uttering indecipherable vocals in a similar fashion, and were hence labelled Mumble Rappers. This style is revolutionary for a music genre that is known for its lexical dexterity and creativity with wordplay. The popularity of Mumble Rappers is exploding and so is the art form, with numerous mumble rap tracks by big artists still coming out every week. The rapping style is characterised by laxations and omissions in the pronunciation of the words, which are known in linguistics as assimilations and segmental deletions. This type of speech thus differs from the pronunciation in other rap music, which is more in line with the standard pronunciation of African American Vernacular English (AAVE). As hiphop language is a representation of AAVE speech (Richardson, 2006), this new way of rapping seems to reflect a development in the use of the English language by a community of native speakers.

AAVE is a language that is systematically different from AmE. This shines through in the lexicon with new vocabulary or in the grammar with constructions such as double negation, but also in the pronunciation system. There is no standard of pronunciation for AAVE, but it is clear that it features a lot of phonetic reduction (Wolfram & Schilling, 2016). This can be observed in the pronunciation of words such as ‘alright’, where there is /r/ and /l/ dropping in the comparison between standard AmE /ɔl'raɪt/ and AAVE /ɔ'arɪ/. It is suggested that this difference in pronunciation between AmE and AAVE has sociolinguistic grounds, as Schwartz (1978) found that AAVE speakers regard emotional factors as more important in speech than linguistic factors. More recently, Polzin and Waibel (1998) found evidence to suggest that the emotional state of the speaker affects the pronunciation accuracy. These findings, however, do not necessarily suggest that AAVE speakers are more emotional than AmE speakers at all times, but they do provide a possible explanation for the decrease in pronunciation accuracy in AAVE speech.

If Mumble Rap is more emotional than the other ways of rapping, this should be perceptible in the voice of mumble rappers, as research shows that an increase of emotion in speech has consequences for the voice quality (Scherer, 1984). More

specifically, emotional speakers have been found to speak louder, more intensely and with a higher intonation than emotionally neutral speakers. This raises the question what the influence is of emotion on the pronunciation accuracy in AAVE speech. If Mumble Rap is indeed more emotional speech than lyrical rap, this should be observable in higher scores on values of vocal parameters.

This study will investigate the influence of emotion on the pronunciation of AAVE conducting a linguistic analysis of rap tracks. First, the pronunciation accuracy will be measured with the help of phonetic transcriptions to distinguish the two categories. This will form as the basis of the second analysis, which will be an in-depth voice analysis with *Praat* software. The average pitch levels, pitch range, and speech intensity will be computed and subsequently analysed to see if mumble rapping can be regarded as more emotional than standard rapping on the basis of these values. The results will provide an answer to the question if mumbling in rap is based on an increase of emotion, which would explain the decrease in pronunciation accuracy. This will help understand the mechanisms underlying changes in the language of a group of AAVE speakers.

2. Background / Literature

2.1.1 The History of Hip-hop

Hip-hop has been said to be conceived in The Bronx, New York around 1973 (Cole, 2015). DJ Kool Herc, known as the founding father of hip-hop, was hosting parties where he would start experimenting with different records playing concomitantly on multiple turntables. This created music that could play for as long as he wanted. Hence, the first beat production was created from this process. Herc started noticing that rhythmically speaking into the microphone sparked something in the crowd, so he invited his friend Coke La Rock to be the stage host so Herc could focus on mixing the records. During one of these parties, Coke rapped his first line ‘‘There’s not a man that can’t be thrown, not a horse that can’t be rode, a bull that can’t be stopped, there’s not a disco that I Coke La Rock can’t rock’’. Rap music was born, and Kool Herc and Coke la Rock are since known as the first MCs.

The style’s popularity spread rapidly around the underground scene of New York (Adaso, 2017). Many new MCs and DJs started experimenting with records and raps. Three artists by the name of Africa Bambaataa, Grandmaster Caz, and Grandmaster Flash acquired

local fame by performing at parties in the neighbourhoods of New York. During one of the parties, Afrika Bambaataa and Disco King Mario directed their raps and beats towards each other, which marks the first battle rap that the style would become famous for. This is also the time when the term hip-hop popped up to describe the rhythm. When the Sugarhill Gang created the first hip-hop track ever in 1979, called 'Rappers Delight', the first lines of the lyrics read "I said a hip hop, Hippy to the hippie, The hip, hip a hop, and you don't stop, a rock it out" (Sugarhill Gang, 1979). The term hip-hop has been used interchangeably with rap music ever since.

The style of hip-hop has always been up for refurbishment. Whereas 1970s and early 80s hip-hop was typical of its light-hearted lyrics and disco sounds, with the Beastie Boys and Salt 'n Peppa as shining examples, hip-hop of the 1980s was rawer. West Coast rap music was emphatic of the gangster lifestyle, with pioneers as Ice-T and Los Angeles' N.W.A.. They got nationwide attention and commercial success but also received considerable critique. Tracks like 'F*ck the Police' were on top of the charts but were criticised at the same time for their aggressive lyrics which even evoked attention of the FBI at some point. The image and the tone with which people talked about rap music was far from positive, but many others new artists were inspired by the reality raps and started rapping about their own lives, and experiences of social inequity and political oppression. The following decade saw record after record being put out and is now seen as the golden era of hip-hop (Duinker & Martin, 2016), with artists like Run-DMC, the Wu Tang Clan, A Tribe Called Quest, Slick Rick, and Outkast innovating the style.

Hip-hop reached to new heights in the 1990s with artists like 2Pac, the Notorious B.I.G., and Snoop Dogg. They helped giving a voice to black communities that suffered from political oppression (Iton, 2008). Unfortunately, this was also the time when a rivalry started between artists from the East Coast and West Coast which resulted in the death of 2Pac and the Notorious B.I.G. among many others. Up to this day feuds, or beefs as they are called by the artists, are a part of hip-hop. Artists like Jay-Z, Kanye West, and Nas also experienced this, but when they first came up in the 1990s they were praised for their creative wordplay and revolutionary sound. The genre penetrated the mainstream radio stations in the United States and was spread across other parts of the world by the end of the century. Eminem was put on stage by his mentor Dr. Dre a few years later. His mesmerising raps made him the most acclaimed white artist up to today.

The new millennium began as a logical follow up to the post Gangsta Rap era. Artist like 50 Cent and Puff Daddy successfully promoted their hardship lifestyle linking their lyrics to catchy beats. The genre continued to gain popularity as more and more artists were being booked by European festivals, with Jay-Z even becoming the first rapper to headline Glastonbury, the worlds' largest festival at the time. At the same time, there was room for an alternative kind of hiphop that did not revolve around the gangster lifestyle. Artists like Lupe Fiasco and Lil Wayne were pioneers of the skateboard genre. They represented a subculture with clever music about every day struggles playing with heavy imagery their lyrics. Whereas the alternatives in hiphop emerged, mainstream hiphop was losing support from the fans. The industry began experimenting with new sounds using technologies to make beats and alter vocals. The attempt to modernise hiphop was not appreciated by everyone. Jay-Z responded with a track called Death Of Autotune, referring to the automated rap voices of artists like T-Pain. Nas even named his new album *Hip-hop is Dead* as a comment on the development in the genre.

Despite the alleged critical state of the genre, the commercialisation continued successfully. This time, new artists were responsible for this development rather than Gangster rappers. Kanye West mixed light-hearted lyrics with complex productions and vice versa on his *Graduation*, and Lil Wayne sold over one million copies in the first week with *Tha Carter III*. They excelled with creative and innovative sound productions using numerous short samples from other tracks to produce beats. A war about copyrights was lurking around the corner but after several lawsuits it was decided that rappers could now buy samples they want to use. They were no longer limited in their creativity, albeit serious questions were raised about the originality of the music. The discussion ended when hiphop legend KRS One concluded the following: "hiphop didn't invent anything, but it reinvented everything". In the Southern states, artists invented the subgenre of Trap music, which centred around gritty and rebellious lyrics guided by heavy kicks and drums (Stelios, 2013).

Since the 2010s, mainstream hiphop has an enormous fanbase and hence all kinds of new artists pop up and help dominate the world's charts. The genre has even become the number one music genre in the US, surpassing rock music (Nielsen, 2017). The big artists of today are Drake, Kendrick Lamar, Pharrell Williams, and J. Cole among many others. They continue to innovate the music by creating their own style and as a result they have acquired worldwide fame. From the Southern States, specifically in Georgia, Atlanta, a new subgenre popped up around 2012. Artists like Migos, Future, and Young Thug delivered rap

music that did not seem to be based on lyricism. Their tracks featured lyrics that were almost impossible to understand because the pronunciation was arguably poor. This did not seem to have any effect on the popularity of these artists though, as hits like ‘Bad and Boujee’ and ‘Mask Off’ reached top positions in the charts despite of the fast and warbling raps. Many other Southern rappers like 21 Savage, Lil Uzi, and Lil Yachty came up with similar rap styles and continue to deliver hits ever since. Mumble Rap has thus found its place in hip-hop.

2.1.2 Controversy

No issue in contemporary hip-hop has sparked off more debate than Mumble Rap. Critics are often supportive of the art or completely against it. On the one hand there are people who see Mumble Rap as an unpleasant break with the conventions of hip-hop, as rap music traditionally revolves around being creative with words rather than with articulation. Lyrical Rap has received most appreciation not just for its lexical dexterity, but also because the music gave a voice to oppressed blacks in several states of the United States during the 1990s. Rap legends like Jay-Z, Tupac Shakur, and Nas were viewed as ‘poets that spoke for a generation of young black Americans’ (Kane, 2018) and this gave them something that came close to biblical esteem. This is not the case for mumble rappers when hearing the majority of the critique on them. One of hip-hop’s pioneers, Eminem, has said more than once that he principally refuses to listen to Mumble Rap. California’s Hopsin even took it a step further when he made a track called *No Words*, in which he says ‘‘These fools ain’t spittin’ no type of dope shit, but that’s not even the bad part: they’re not even saying the words anymore.’’ Many rappers as well as fans have voiced a similar opinion. Hopsin and Eminem represent an audience who believe hip-hop is turning into a rudiment of what was once a precious art.

The other side of the debate tends to see Mumble Rap as something more complex, with mumble rappers being innovators of an evolving music genre. Although the warbling in songs does not seem to carry a lot of meaning, this is not necessarily true. Mumble rappers still use lyrics to express themselves, but they put more energy in being creative with their voice. This makes it harder for listeners to decipher the lyrics, but that does not say anything about the lyrical dexterity. Although not a mumble rapper himself, current rap star Kendrick Lamar called Mumble Rap ‘‘an evolution of hip-hop’’ in an interview with *Forbes* (O’Malley Greenberg, 2017). Many people, such as acclaimed writer Shea Serrano

shares this perspective when he talks about the Atlanta artists Young Thug and Future, perhaps the most forefronted mumble rappers. He states that their music indeed fails to follow the tradition of self-expression through wordplay, but instead it represents ‘...the latest step in the genre’s linguistic evolution: Young Thug expresses his feelings more purely through sounds’ (Locke, 2015). Lyrical articulation in contemporary hip-hop seems to be diminishing then, with more and more focus given to creative articulation.

2.1.3 Defining Mumble Rap

Whereas critique on Mumble Rap is widespread, a clear definition remains absent. The term was introduced by rapper Wiz Khalifa early 2016 (Landoll, 2016), but a blueprint of what constitutes Mumble Rap has never been created. This means that, at best, a description can be coined with the help of several sources as well as a phonetic analysis. First, there are several definitions of mumbling as a speech phenomenon. The Oxford Dictionary defines a mumble as ‘saying something indistinctly and quietly, making it difficult for others to hear’ (Mumble, n.d.). Linguist Darin Flynn called it “speech that can be considered as informal, authentic, and natural” (Flynn & Morel, 2017). Academic studies often define mumbling as having to do with a reduced voice loudness (Mattys & Liss, 2008; Singer, 2009; Arvola, Arvid, Tholander, 2011). These descriptions do not cover the full phenomenon of Mumble Rap though, as artists do not necessarily differentiate in the volume of their voices other than lyrical rappers or regular speech in general. The term that is used in discussions around the hip-hop style seems to deal with the pronunciation aspect of rapping only. It can be concluded that there is a mismatch in the term and the phenomenon, which could be the reason why there is still no comprehensive definition of Mumble Rap.

Mumbling in rap music mainly revolves around faded syllables and deleted segments, making the lyrics potentially unintelligible. Segmental deletion occurs frequently in regular speech (Davidson, 2006), and is thus not something unique to music. The best known example of segmental deletion in the English language is the elision of the schwa, for example in the pronunciation of ‘semester’ as /s'mɛstər/. Davidson (2006, p.3) points out that the faster people speak the more likely it is that they do not pronounce all segments, which could mean that rapping naturally evokes segmental deletion. Yasim (1995) constructed a corpus of rap songs, and concluded that a rap track contains an average of 144 beats per minute, and each beat indicates one stressed syllable. He points out that unstressed syllables are not counted in this calculation, which indicates that the estimation of a minimal

utterance of the double amount of 144 syllables per minute is accurate, and this number is possibly even higher. This exceeds the speech rate of 220 syllables per minute that is average in spontaneous speech of speakers of American English (Michael, Maclagan, Chen, 2004, p.2). It can thus be expected that syllable- and segmental deletion is more likely to occur in rap music because of the speech rate of rapping.

A typical example of a Mumble Rap song comes from Lil Uzi's '*XO Tour Life*', in which he raps several lines that are almost undecipherable without reading the lyrics. This becomes clear when listening to the song, but also when looking at the phonetic transcription of Uzi's rapping. Table 1 shows the phonetic transcription of a line from the song, in which segmental deletion and fading syllables can be observed.

	I	Might	Blow	My	Brains	Out
Phonetic Transcription Standard AmE	aɪ	maɪt	bloʊ	maɪ	breɪnz	aʊt
Transcription of the Mumble Rap	a	maɪ	blo	ma	breɪ	a:
# Phoneme loss	1	1	1	1	2	2

Table 1. Pronunciation of a chorus line from *XO Tour Life*

The loss of phonemes is called deletion, and this occurs frequently in AAVE (Labov, 1995). There are two ways in which deletion occurs. First, there is vowel- or consonant deletion, which happens with the /ə/ in *fear* [fɪr] or the /r/ in *four* [fo]. This can be the result of progressive or regressive assimilation, but also because of omissions when segments are syllable-initial or syllable-final. Deletion also occurs with syllables, changing the number of syllables in words. An example of this is the pronunciation of 'probably' [probebli] as [proli].

2.2.1 Emotion in Speech

The term emotion has been used interchangeably with arousal and sensation in contemporary science. That is why it has been defined and redefined throughout the years by many scholars, predominantly from the social sciences. The definition that is frequently used in linguistics is formulated by Izard (1977), who describes emotion as “... (a) the experience or conscious feeling of emotion, (b) the processes that occur in the brain and nervous system and (c) the observable expressive patterns of emotion (p.4)”. Emotions come and go, and the intensity as well as the duration can change instantly. Whereas most of the research has focused on the experience of emotions, this study will look at the expression of emotions, i.e. behavioural activity. There are several ways to express emotions, such as the use of gestures, face expression, and speech. The latter is the primary indicator of the emotional state of the speaker, and will therefore be analysed in this research.

Research into the role of emotion in speech can be done in two ways. The lexicon can be taken as an indicator of affective changes as people typically use different words when they experience arousal (Mohammad & Turney, 2010). It is also possible to look at paralinguistic features when studying emotion, which has been the main focus of research on emotion in speech since the 1980s. The seminal researches by Sherer (1984, 1986) have aimed at exploring the voice quality in the expression of basic emotions like anger, fear, and happiness. He found that loudness, fundamental frequency and voice quality change when speakers become aroused. More specifically, he showed that the tension of voice relates to the expression of emotion. Evidence suggests that a tense voice is indicative of either anger, joy, or fear, whereas a lax voice often indicates sadness. There is a lot of overlap in this though, as two opposite emotions like anger and happiness have similar voice qualities. He stressed that additional work into vocal expression and the role of emotion is required to identify patterns in voice quality. His research, however, functioned as the basis of research in emotion analysis and the role of voice and voice quality in emotional speech.

The prosodic domain has many more factors which have been researched in further studies on emotional speech. El Ayadi, Kamel, and Karray (2011) have constructed an overview of speech features. In an attempt to design a speech recognition machine, they looked at several speech studies to pinpoint the pivotal features of emotional speech. They analysed the methodology and results of 17 studies, including Chinese, German, Danish and Mandarin studies apart from English. Most of them used professional actors, or at least some sort of stimulated speech in their design. Emotions such as anger, fear, joy, and

sadness were acted out to investigate the voice characteristics. Looking at the results, El Ayadi, Kamel, and Karray (2011) found that emotions could be distinguished by their values on features related to pitch, formants, energy, timing, and articulation. This gave them the opportunity to construct a set of features which consisted of all the vocal parameters that were necessary for the design of their machine. They listed intonation, pitch levels, speech rate, speech volume and enunciation energy as the key features of emotional speech.

2.2.2 Intonation, pitch, and pitch range

Many researchers have also investigated voice characteristics of emotional speech. Mozziconacci and Hermes (1999) focussed on the role of intonation, specifically when people convey emotions and attitudes to one another. They were able to measure intonation looking at the pitch levels speakers reached with their voice. There are two ways in which they investigated intonation patterns. They first analysed the audio waves of emotional speech fragments. Three Dutch speakers were asked to enact six emotions and a neutral utterance of preselected sentences. They had intonation experts listen to these fragments next, and categorise the pitch waves using the standard of the Dutch grammar of intonation by 't Hart, Collier, and Cohen (1990). For example, the sounds could be labeled as, 'an early prominence-leading rise' (1), with 'a late prominence-leading fall' (A). Although they did not find a clear one-to-one pattern for every emotion, there were patterns that were found significantly more often in expressing emotions than in expressing non-emotional speech, such as the patterns that end with either 'a very late non-prominence leading rise' (2) or 'a very late non-prominence leading fall' (C). This was taken as evidence of the claim that speakers use intonation patterns to convey emotions.

The second part of the analysis was done with the help of an experiment designed to test this relation. Mozziconacci and Hermes (1999) modified neutral sentences, such as 'Zij hebben een nieuwe auto gekocht' into an emotional sentence with a voice synthesiser, copying the patterns they found in the first test. Participants were then asked to assign emotions to varieties of the same sentence. They correctly identified the pre-intended emotion in 22.1% of the cases, which is just above chance level. The researchers explain this low score by stating that pitch levels and pitch range, which are the key components of intonation, may well indicate other emotions than the one they had constructed. They suggest that other aspects of voice such as voice quality and speaking rate contain the necessary information about emotions that participants need to correctly identify them.

These were kept constant in this study, which suggests that the assessors had too little information available to perform at a higher standard. Although these results show that there is no clear one-to-one relation between emotions and specific intonation patterns, evidence from the first analysis suggests that intonation plays a key role in expressing emotion through speech.

Rodero (2002) conducted a similar experiment with participants to see if intonation patterns link up with the perception of emotions. She had speakers read out the sentence: “It was a morning just like any other. However, the meeting would be a way to talk about life. He did not know if it would be good or bad” four times enacting four different emotions. This resulted in a total of 64 recordings which were analysed using *Praat*. Without any instructions about speaking at certain pitch levels, the speakers all systematically used different pitch levels for different emotions. This is the first indication of the pivotal role of pitch levels in expressing emotions. To further explore this relation, she had students without prior knowledge of voice analyses listen to the recordings and recognise the emotions. They correctly identified all four emotions well above chance level, with sadness being the emotion that was recognised most accurately. It is hence concluded that the emotional load of speech is conveyed by movements in the intonation curve and pitch levels. These findings also indicate that listeners successfully extract the information a speaker put in his voice, which explains why people use different pitch levels in communicating messages. It is thus argued that intonation and pitch levels are the pivotal factors in studying the emotional load of speech.

Further evidence on intonation and pitch levels in emotional speech comes from the medical sciences. Möbes, Joppich, Stiebritz, Dengler, and Schröder (2008) investigated voice fragments of Parkinson’s patients, as they typically produce monotonous speech as a result of their deficient nervous system. They questioned the idea that motor impairment is the reason for their way of speaking, so they designed an experiment to test this notion. Sixteen patients were included in their study who all still had a phonation capacity that was similar to a healthy person’s capacity. The patients were asked to once say and once imitate the word “Anna” in a happy, sad or neutral emotional state. The control group, which consisted of healthy people of roughly the same age, followed the same procedure but without the imitation task. The results showed that patients spoke with a significantly lower pitch level and loudness than healthy people in the production task. When asked to imitate, however, the patients produced speech with almost equal values to healthy patients

in all three emotional states. The results not only indicate that motor impairment cannot explain the monotony of PD speech, but they also suggest that people naturally use pitch levels and loudness to distinct emotional speech from neutral speech.

These studies show that emotional speech is different from neutral speech, and this is best observed by looking at the pitch levels of speech utterances. The sudden drops and rises in the audio waves are claimed to be direct indicators of a change in the emotional state of the speaker. Results from Mozziconacci and Hermes (2002) suggest that the identification of emotions is a process that can be analysed when incorporating the full range of voice characteristics. This is, however, beyond the scope of this study.

2.2.3 Intensity

Another way to express emotion in speech is by putting in effort in terms of intensity and loudness. Intensity relates to the amount of energy someone uses to speak, and is therefore a reflection of the affective state of the speaker (Scherer, 2000, p,225). Intensity is easy to measure but there may be some confounding variables that intervene in the measurement process, such as the acoustic characteristics of the recording environment. The importance of the methodology is something to be taken into account in the following discussion of the studies regarding speech intensity.

Bacharowski and Owen (1995) investigated speech intensity by evoking emotions on the participants' side. They had 120 participants perform a lexical decision task while wearing a headset. They were recorded as the computer gave feedback after every block of answers, such as 'Good Job' or 'Try Harder' accompanied with an emoji. Participants in the reward group got 75% percent positive feedback and 25% negative feedback whereas participants in the failure group got feedback in a reversed ratio. The feedback was thus either congruent or incongruent with the answer, irrespective of the performance of participants. The intention was to induce negative and positive responses so the voice characteristics of their comments could be measured. They measured the fundamental frequency (pitch levels) and the perturbation of the voices by looking at the values on jitter and shimmer. These are variables related to voice quality, and thus correlate with the intensity of speaking. The results of the experiment showed a significant effect of fundamental frequency, but no effects for jitter and shimmer were found. The researchers consider the technological limitations of the experiment in their review of the unexpected insignificant results. They emphasise that jitter and shimmer are still highly likely to be

indicators of intense emotional speaking, but further research is needed to legitimise this claim. They do conclude on the basis of pitch levels that the intensity of speech is a representation of the emotional state of the speaker.

Laukka, Juslin, and Bresin (2004) further explored the acoustical properties of emotional speech. Among other factors, such as fundamental frequency and speech rate, they looked at voice intensity as a characteristic of emotion. This was operationalised as loudness and measured by using the perception of students. In line with previous research, they distinguished between several emotions (anger, fear, disgust, happiness and sadness), but they did not compare these with phrases of neutral emotion. They asked eight actors to enact the emotions either with weak intensity or strong intensity. They expected to find higher rates of loudness in strong emotion intensity speech than in weak intensity speech. 176 recordings were acoustically analysed on a number of vocal cues by two groups of listeners. One group consisted of students whereas the other was formed by six experts on speech analysis. They were asked to listen to the fragments and label each fragment as either low or high in emotional intensity. Both groups consistently scored the strong intensity fragments as more emotional than the weak intensity fragments for all five emotions. The conclusion follows that voice intensity is a key factor in expressing and perceiving emotion in speech.

Cowie and Douglas-Cowie (1996) looked at energy levels in emotional speech in an attempt to explain intensity variations in the prosodic domain. They constructed five passages displaying four emotions (anger, fear, joy, sadness) and a neutral tone to function as a baseline. Forty volunteers were asked to read the passages out loud so the researchers could measure the speech volume as an indication of intensity. An ASSESS analysis showed systematic differences between intensity levels in all five passages. The passages evoking anger, fear, and happiness were read out at a significantly higher mean and median volume than the sad and neutral passage. These results provide further evidence of the relation between emotional speech and loudness as an indicator of intensity.

The results of these studies suggest that the intensity of speech correlates with the emotional state of the speaker. An emotional speaker naturally speaks louder than a calm speaker, as is the claim. The studies conducted laboratory experiments with actors or pre-selected speakers in contrast to this study, which will use audio extracts from music tracks to analyse the intensity in the voices. It is yet unclear if these voice fragments can be analysed

in a similar way, but if there are differences in intensity between the two rap styles, this should be observable in the decibel measurement of the software.

2.2.4 Pronunciation

Polzin & Waibel (1998) looked at the pronunciation in emotional expressions, as they were interested in the recognition accuracy of emotions in emotional speech. They opted to design a machine that could recognise emotions comparable to human performance, for which they needed to investigate acoustic information of emotional speech. This kind of information is different than prosodic information as it centers around influences on pronunciation rather than suprasegmental influences. They had drama students utter a number of sentences imitating four different emotions (anger, sad, happy, afraid). They had to say the sentences twice, once acting emotionally neutral, and once with the expression of an emotion. These were then transcribed to measure the number of segmental deletions and establish the relation between pronunciation accuracy and emotional speech. Results showed that the word accuracy was highest in the utterance of no emotion, with 71,9%. This differed with the word accuracy of the emotional fragments, which ranged from 45,6% in the expression of sadness until 64,2% in the angry sentences. They did not perform any statistical tests on these data as they were primarily interested in the design of the machine, but they did make claims concluding that emotion in speech has a negative effect on the word accuracy. They also conducted a small experiment asking participants to recognise the emotion and interpret the meaning of the words. The expectation followed that the word recognition rate would drop as a result of a decrease of acoustic information, i.e. the segmental deletions in emotional speech. A pretest showed that they had no problem identifying emotions and words in the neutral pronunciation. However, participants scored significantly lower in recognising the words when the sentences were uttered in an emotional state. When given the emotion beforehand, the recognition rate increased significantly, up to 70,1% for the sad utterances compared to 77,6% for the neutral. This difference is still significant, but it does indicate that knowledge of the speaker can positively affect the intelligibility of the speech utterance. That information, however, does not contradict the notion that word accuracy is negatively affected by emotional speech.

This is supported by similar research conducted by Kienast & Sendmeier (2000), who found other evidence to suggest that emotion affects articulation. They looked at consonant articulation, as they claim that the pronunciation accuracy of consonants suffers

most from an emotionally aroused speaker. Apart from the four basic emotions that Polzin & Waibel (1998) included in their experiment, the researchers added boredom, disgust, and neutral as versions of emotion. They were interested in four aspects of articulation; progressive and regressive assimilations, segmental reduction, and energy distribution in voiceless fricatives. It was hypothesised that these processes occur frequently in emotional speech after Kohler (1990), who found pronunciation effects in an investigation into German. Although the idea was attested, the researchers were interested if this evidence would hold up for other languages so they created an English corpus of audio fragments for their study. They conducted an experiment in which they asked five male and five female actors to enact the seven different emotions in a number of sentences, and analysed these fragments with the help of professional phoneticians. It was found that the average number of assimilations is significantly lower in the expression of fear, sadness, boredom, and anger than in neutral and happy utterances. Segmental reduction occurred most frequently in the sentences expressing joy, sadness, and fear, and less frequently in the neutral and happy versions. The vowel quality was also measured, and found to be better in the angry utterance than in the other utterances. These results were all significant. They suggest that the fast speech rate of the actors is responsible for the assimilations and deletions, as this is one of the most important reasons for reduction in speech (Kohler, 1990). These results are especially interesting because this study involves rap music, and the nature of rap music involves producing a lot of words in a relatively short time.

2.3 Expected Findings

Following Kienast & Sendmeier (2000) and Polzin & Waibel (1998) raises the expectation that Mumble Rap tracks have a lower pronunciation accuracy than Lyrical Rap tracks. It is also expected, after Mozziconacci and Hermes (1999) and Roderio (2002), that Mumble Rap tracks have a higher average intonation than Lyrical rap tracks. This translates into the hypotheses that Mumble Rap is higher in average pitch, and has higher average pitch ranges. Following research by Cowie and Douglas-Cowie (1996), it is hypothesised that Mumble Rap is more emotional than Lyrical Rap because of a higher intensity that is put into speech.

Emotional speech can be distinguished from neutral speech with the help of the literature. The findings provide insight into the role of pronunciation, intensity, and pitch levels in emotional speech. Most of the studies, however, base their conclusions on findings

in experiments. To see if hiphop music can function as a new corpus in emotional speech research, a selected sample of tracks are first to be analysed on the vocal parameters discussed in the previous sections. This study will thus make an attempt in finding differences in emotion in rap styles conducting a linguistic analysis. If the hypotheses are confirmed, the results could function as a basis of experimental research using different rap styles.

3. Method

3.1 Content Analysis

According to Wichmann (2000), the most accurate way to detect emotion in speech is via a linguistic analysis. The decision was hence made not to use participants' judgements of emotional content but to perform a quantitative analysis of rap tracks to be able to make stronger claims about the emotional load. The speech in Mumble Rap tracks and Lyrical Rap tracks was compared in two ways. First, phonemic transcriptions of the texts were constructed with the help of www.topphonetics.com. This gave the transcriptions of the lyrics according to standard American English (AmE). The vocals of the raps were phonetically transcribed next to see the difference with the model pronunciation and count the number of segmental deletions. These were analysed with the help of SPSS to test the word- and sentence accuracy of the raps, i.e. the pronunciation accuracy. Second, the vocals of the tracks were analysed on several factors of emotion using the computer software Praat. This programme has proved to be an effective method in exploring the prosodic features of English speech (Gorjian, Hayati, Pourkhoni, 2013). The tracks were segmented according to the number of lines to be analysed. The average intensity, average pitch, and pitch range were the three factors extracted from Praat. These were assembled in a dataset which was analysed with a within-subjects dependant T-test in SPSS.

3.2 Eliminating Variables

Tracks were matched on several criteria to eliminate possible disturbing factors in the analysis when selecting the sample. The tracks were eligible for the sample only if their duration was between 3 and 4 minutes, as this ensured that rappers had equal time to divide their enunciation energy. As research by Heffernan (2010) found that clarity of speech is based on gender, i.e. men naturally use more voice reduction than women (p.83), this

analysis only included tracks from male rappers. Similarly, every artist was included maximally one time in the sample to have as many different voices as possible to analyse. This ensured that the results did not reflect individual speech styles, and conclusions could be drawn based on the speech style of a group of AAVE speakers. The tracks were also matched on theme/genre to limit the likelihood that the difference in lyrical content determine the emotional load of the tracks. This possible interference was negligible by selecting a sample of 10 tracks.

3.3 Sample Selection

The tracks that were included in the analysis were selected from two lists on Spotify, called ‘mumble rap’, and ‘lyrical rap’, which gave a combined list of 200 tracks. Tracks that featured female vocals in any form were eliminated from the sample, leaving 189 tracks. In order to match theme/genre, the tracks were categorised with the help of the song-text database Genius as this website gives short thematic descriptions of the tracks. After an analysis of the lyrical content, the songs were categorised in four themes: sex/love, money, introspection, and self-promotion. This gave a total of 110 tracks. To test if the tracks were rightfully labelled as either Mumble Rap or Lyrical Rap, they were subjected to a phonetic analysis. The first verse (16 lines) of these tracks were transcribed and scored on the number of instances of segmental- and syllable deletion, thereby determining if a track could be categorised as a Mumble Rap, Lyrical Rap, or Indecisive. When Mumble Rap tracks showed a minimum average of 2 instances of segmental deletion per line, they were categorised as such. Lyrical Rap tracks were selected and similarly analysed, and categorised as such when no more than an average of 1 instance of segmental deletion occurred per line.

Tracks falling under the ‘Indecisive’ category were not included in the analysis. This selection process resulted in 5 representative tracks for both categories that were matched on duration, gender, and content, making up a total of 10 tracks for the sample. The following table shows the tracks that were taken for the sample.

Table 2. The selected tracks from the two categories

Lyrical Rap	Mumble Rap	Genre
Outkast - Rosa Parks	Young Thug - No Limit	Sex/Love
Drake - The Zone	Lil Yachty - I Spy	Self-Promotion
Dr. Dre ft. Snoop Dogg - The Next Episode	Future - Mask Off	Drugs
Eminem - Mockingbird	Chief Keef - Champagne	Introspection
J. Cole - Forbidden Fruit	Migos - T-Shirt	Self-Promotion

3.4 Procedure

The first step of the dual analysis of the tracks involved an analysis of the phonetic transcriptions to see if there was a difference in pronunciation accuracy between Mumble Raps and Lyrical Raps. This was done by comparing every track's standard phonetic transcriptions of American Standard English (AmE), which were provided by Top Phonetics, to the transcription of the pronunciation of the lyrics. Every sentence was scored on the number of occurrences of segmental deletion, by which the division could be made between Lyrical Rap tracks and Mumble Rap tracks. Below are two representative samples of the analysis of Lyrical Raps tracks and two examples of the analysis of Mumble Rap tracks.

Example 1. Outkast - Rosa Parks (Lyrical Rap)

Lyrics:

I met a gypsy and she hipped me to some life game
To stimulate then activate the left and right brain
Said baby boy you only funky as your last cut
You focus on the past your ass'll be a has what
that's one to live by or either that one to die to
I try to just throw it at you determine your own adventure
Andre, got to her station here's my destination

She got off the bus, the conversation lingered in my head for hours
Took a shower kinda sour cause my favorite group ain't coming with it

Standard AmE:

Pronunciation:

aɪ mɛt ə 'dʒɪpsi ænd ʃi hɪpt mi tu sʌm laɪf geɪm	≠
tu 'stɪmjəleɪt ðɛn 'æktəveɪt ðə leɪft ænd raɪt breɪn	≠
sɛd 'beɪbi bɔɪ ju 'oʊnli 'fʌŋki æz jʊər læst kʌt	kʌ [1s]
ju 'foʊkəs ʌn ðə pæst jʊər æs'l bi ə hæz wʌt	wʌ [1s]
ðæts wʌn tu lɪv baɪ ɔr 'iðər ðæt wʌn tu daɪ tu	wʌ [1s]
aɪ traɪ tu dʒʌst θrou ɪt æt ju dɛ'tɜrmən jʊər oʊn æd'ventʃər	θoʊ [1s]
'ʌn,dreɪ, gʌt tu hɜr 'steɪʃən hɪrz maɪ ,dɛstə'neɪʃən	≠
ʃi gʌt ɔf ðə blʌs, ðə ,kʌnvər'seɪʃən 'lɪŋgərd ɪn maɪ hɛd fɔr 'aʊərz	≠
tʊk ə 'ʃaʊər 'kɪndə 'saʊər kʌz maɪ 'feɪvərɪt grʊp eɪnt 'kʌmɪŋ wɪð ɪt	≠

Example 2. Usher ft. Young Thug - No Limit (Mumble Rap)

Lyrics:

You finer than wine
Baby girl I ain't lying
Make my homies drop a dime
Commit a crime
Jeopardize my lifeline
Just to see your vital sign
Ain't no limit, babe we do it larger
Ain't no limit babe when you a starter
Martyr outsmart the 'Rari, 'Rari

Standard AmE:

Pronunciation:

ju 'faɪnər ðæn waɪn	ju 'faɪnər ðæn wai [1s]
'beɪbi gɜrl aɪ eɪnt 'laɪɪŋ	beɪbi gɜrl aɪ eɪn 'laɪ [3s]

meɪk maɪ haɪmɪs drəp ə daɪm
 kə'mɪt ə kraɪm
 'dʒɛpə,daɪz maɪ 'laɪ,flaɪn
 dʒʌst tu si juə 'vaɪtəl saɪn
 eɪnt noʊ 'lɪmət, beɪb wi du ɪt 'lɑdʒər
 eɪnt noʊ 'lɪmət beɪb wɛn ju ə 'stɑrtər
 'mɑrtər 'aʊt,smɑrt ði 'Rɑri, 'Rɑri

meɪk maɪ hoʊmɪ drəp ə daɪ
 [2s]
 kə'mɪt ə kraɪm [1s]
 'dʒɛpə,daɪ maɪ 'laɪ,fla [4s]
 dʒʌs tu si juə 'vaɪtə saɪ [4s]
 eɪn noʊ 'lɪmə,
 beɪ wi du ɪt 'lɑdʒə [4s]
 eɪn noʊ 'lɪmə beɪ
 wɛn ju ə 'stɑtə [4s]
 'mɑrtə 'aʊ,
 ,smɑrt ði 'Rɑri, 'Rɑri [2s]

Example 3. J Cole - Forbidden Fruit (Lyrical Rap)

Lyrics:

Ey yo, I walked through the valley of the shadow of death
 When niggas hold tec's like they mad at the ref
 That's why I keep a cross on my chest, either that or a vest
 Do you believe that Eve had Adam in check?
 And if so, you gotta expect to sip juice
 From the forbidden fruit and get loose
 Cole is the king, most definite
 My little black book thicker than the Old Testament
 Niggas pay for head but the pussy sold separate

Standard AmE:

eɪ joʊ, aɪ wɔkt θru ðə 'væli ʌv ðə 'ʃæ,dou ʌv dɛθ
 wɛn nɪgɛz hoʊld tɛks laɪk ðeɪ mæd æt ðə rɛf
 ðæts waɪ aɪ kɪp ə krɒs ʌn maɪ tʃɛst, 'iðər ðæt ɔr ə vɛst
 du ju bɪ'lɪv ðæt ɪv hæd 'ædəm ɪn tʃɛk?
 ænd ɪf soʊ, ju 'gætə ɪk'spɛkt tu sɪp dʒus

Pronunciation:

wɔk [1s]
 ≠
 ≠
 bɪ'li [1s]
 ≠

frʌm ðə 'fɔrbɪdən frʊt ænd gɛt lus	≠
kouʌ ɪz ðə kɪŋ, moust 'dɛfənət	mouʊs [1s]
maɪ 'lɪtəl blæk buk 'θɪkər ðæn ði ouʌld 'tɛstəmənt	ouʌ [1s]
nɪgəz peɪ fɔr hɛd bʌt ðə 'pʊsi souʌld 'sɛprət	≠

Example 4. Lil Yachty ft. Kyle - I Spy (Mumble Rap)

Lyrics:

She said she 21, I might have to I.D. that
 All my bitches come in pairs like balls in my nutsack
 I remember ridin' around the city in a hatchback
 Lookin' for a problem with my young goblins
 I'mma send a model home with her neck throbbin'
 I done made so much money that it's non-stoppin'
 Got my brothers on my back like the last name
 I remember tellin' everyone I couldn't be tamed
 Woah, six months later I had snapped and now I'm in the game

Standard AmE:

Pronunciation:

ʃi sɛd ʃi twɛnti wʌn, aɪ maɪt hæv
 tu aɪ.di. ðæt
 ɔl maɪ 'bɪtʃɪz kʌm ɪn pɛrz laɪk
 bɔlz ɪn maɪ nʌtsæk
 aɪ rɪ'mɛmbər 'raɪdɪn ə'raʊnd
 ðə 'sɪti ɪn ə 'hætf,bæk
 'lʊkɪn fɔr ə 'prabləm
 wɪð maɪ jʌŋ 'gəblɪnz
 l'mə sɛnd ə 'mɑdəl hoʊm
 wɪð hɜr nɛk 'θrɑbɪn
 aɪ dʌn meɪd sou mʌtf 'mʌni
 ðæt ɪts 'nʌn,stapɪn

ʃi sɛ ʃi twɛti wʌn, aɪ maɪt hæv
 tu aɪ.di. ðæ [4s]
 ɔl maɪ 'bɪtʃɪz kʌm ɪn pɛrz laɪk
 bɔlz ɪn maɪ nʌtsæ [1s]
 aɪ rɪ'mɛmbə 'raɪdɪ 'raʊn
 ðə 'sɪti ɪn ə 'hætf,bæ [5s]
 'lʊkɪn fɔr ə 'prabləm
 wɪð maɪ jʌŋ 'gəblɪ [2s]
 l'mə sɛn ə 'mɑdəl hoʊm
 wɪð hɜr nɛ 'θrɑbɪn [2s]
 aɪ dʌn meɪ sou mʌtf 'mʌni
 ðæt ɪts 'nʌn,stapɪ [2s]

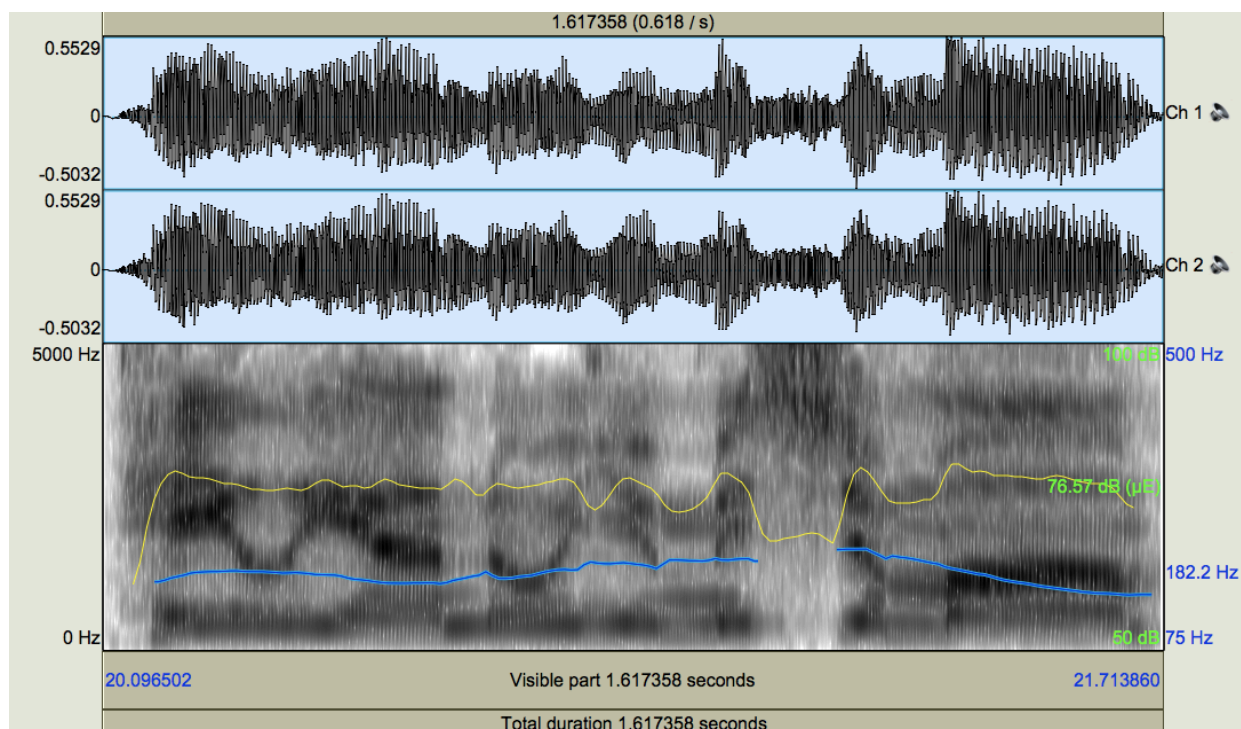
gæt maɪ 'brʌðərz æn maɪ
 bæŋ laɪk ðə læst neɪm
 aɪ rɪ'membə 'telɪn 'evri,
 wʌn aɪ 'kʊdənt bi teɪm
 Wu, sɪks mʌnθs 'leɪtə aɪ hæd
 snæpt ænd naʊ aɪm ɪn ðə geɪm

gæt maɪ 'brʌðərz æn maɪ
 bæŋ laɪk ðə læs neɪ [3s]
 aɪ rɪ'membə 'telɪn 'evri,
 wʌn aɪ 'kʊd'n bi teɪm [4s]
 Wu, sɪks mʌns 'leɪtə aɪ hæd
 snæt æn naʊ aɪm ɪn ðə geɪm [4s]

3.5 Phonetic Analysis

The second way of analysis involved a phonetic analysis using Praat software. For this to be successful, the vocals of each track had to be separated from the accompanying beats. The acapella version of several tracks were available on the website acapalle4u.com. Those which were not available were manually edited using the software from phonicmind.com. This gave the vocals of ten tracks in total. These were put into Praat to be able to measure intonation, pitch, and enunciation energy (labeled as intensity). The tracks were segmented in the number of lines they count, the chorus excluded. This gave the possibility to measure each factor for each line and hence get a number of scores for every track.

Fig 1. The audio waves of a line from *Mockingbird* by Eminem



The yellow line shows the average intensity of the line measured in decibels, which received a score of 76,57 dB. Pitch was measured in Hertz on the right hand side of the lower part of the figure. As observed, this can vary between 0 and 500 Hz, and received a score of 182,2 Hz for the first line of the rap verse. The maximum pitch (151,90 Hz) and the minimum pitch (215,98) of each line were extracted from the programme, which gave a pitch range of 64,08 Hz. This measurement process was done for every line of the selected tracks which resulted in three scores for each of the 197 lines of the sample.

4. Results

4.1 Pronunciation

The total of rap lines included in the analysis is 197. The category Lyrical Rap contains 113 lines which leaves 84 lines to be analysed in the category Mumble Rap. The maximum number of segmental deletions observed in a line is 5 whereas the minimum is 0. There is no line of the category Mumble Rap that shows no segmental deletions, whereas there are 83 lines of Lyrical Rap that show no segmental deletions. The mean score for Mumble Rap was higher (2,52, SD = 1,058) than the mean score for Lyrical Rap (0,27, SD = 0,468). The data were analysed with a Pearson Chi-Square test which showed a significant difference in pronunciation accuracy between the two groups ($P = .00 < 0.05$).

4.2 Intensity

The highest average intensity measured in decibels (dB) was 79,94 and the lowest was 64,12. The mean intensity was slightly higher for the category Lyrical Rap (73,72 dB, SD = 3,95) than the mean intensity for category Mumble Rap (72,57 dB, SD = 3,07). The data were analysed with a T-Test for independent samples which gave an F-value of 0.179. This turned out to be not significant ($P = .672 > .05$) and the direction was also against expectations.

4.3 Pitch

The highest pitch measured in Hertz (Hz) was 355,4 whereas the lowest was 106,8. The mean pitch was higher for the category Mumble Rap (216,40 Hz, SD = 48,61) than the mean pitch for category Lyrical Rap (165,35 Hz, SD = 28,08). The data were again analysed with an independent samples T-Test. The F-value was 25,83 with significance of .000 which is

below the standard of $p = 0.05$. There is thus a significant difference between the groups in the Pitch.

The following graphs show examples of the developments in pitch and intensity throughout the pronunciation of a line from two tracks. The black line in figure 2 shows the pitch fluctuations between the utterance of the last and last word of the line. The red line also shows the fluctuation in intensity and hence gives an indication of the enunciation energy by the artist. The line from *Mockingbird* by Eminem shows a more stable progression of the pitch and intensity levels then the line from *No Limit* by Usher and Young Thug. As the latter falls under the category Mumble Rap, this conclusion is in line with the expectation.

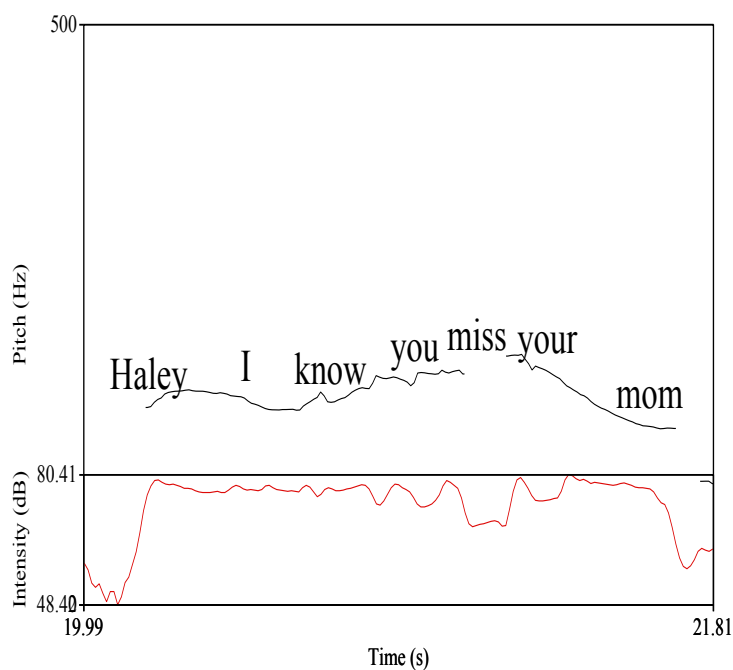


Fig 2. The pitch and intensity of the first line from *Mockingbird* by Eminem

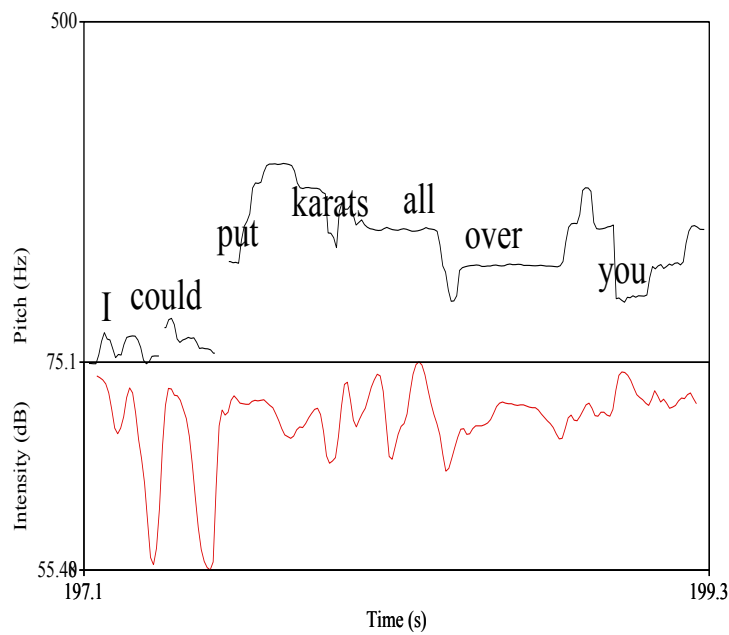


Fig 3. The pitch and intensity of a line from *No Limit* by Usher and Young Thug

4.3 Pitch Range

The highest pitch range was measured in the track *Mask Off* by Future from the category Mumble Rap, with a score of 412,37 Hz. The lowest pitch range was found in a line from *The Zone* by Drake, with a score of 7,44 Hz. The mean pitch range for the category Mumble Rap was higher (222,58 Hz, SD = 96,33) than the mean pitch range for the category Lyrical Rap (118,29 Hz, SD = 82,63). Again, an independent samples T-Test was conducted which gave an F-value of 3,866. The results were not significant as the p-value (0,051) was just above the level of significance (0,05). Figure 3 shows a schematic representation of the results of the statistics test of pitch range as well as the other three variables.

Table 3. Results of the Analyses

Variable	p.
Pronunciation Accuracy.	.00*
Intensity	.672
Pitch	.00*
Pitch Range	.051

*p < .05

4.4 Other Findings

The researcher noticed some unexpected differences between the audio waves of tracks from different genres during the phonetic analysis. For example, the two tracks of the introspection genre, Eminem's *Mockingbird* and by Chief Keef's *Champagne*, seemed more monotonous than tracks from the other genres. This suspicion was explored by looking at the mean pitch range from these tracks and comparing it with the mean pitch range of the other three genres. Three independent samples T-Tests gave a significant difference in pitch range of Introspection tracks with Sex/Love tracks ($P = .00 < .05$), with tracks from the genre Self-Promotion ($P = .001 < .05$), and with tracks of the genre Drugs ($P = .022 < .05$). It could thus be concluded that there is a significant difference in pitch range between introspective tracks and tracks revolving around drugs, sex, and self-promotion.

5. Conclusion

The main goal of this research was to investigate if Mumble Rap is a representation of a new speech phenomenon in AAVE that allows speakers to put more emotion in their speech by dropping in pronunciation accuracy. Results from the analyses suggest that Mumble Rap is more emotional than Lyrical Rap on the basis of a decreased articulation and higher average pitch levels.

The first aspect of the study dealt with the distinction between the two styles of rapping. The expectation after listening to the tracks followed that Mumble Rap tracks show a great number of segmental deletions and syllable fading, and the phonetic analysis confirmed this hypothesis with a significant difference with Lyrical Rap tracks. The five rappers that were selected for this category showed a word accuracy that could almost serve as model pronunciation of standard AmE. This contrasts with the intelligibility of the Mumble raps, which is often arguably impossible to comprehend at the first time someone listens to the tracks. The results of the first analysis suggest that this way of rapping is more emotional than rapping with a relatively clear pronunciation, which could thus be explained by suggesting that the pronunciation accuracy drops as a result of emotional speech.

The second part of the study investigated intensity, pitch, and pitch range as the vocal parameters of emotional speech. Whereas the average pitch was significantly higher in the Mumble Rap sample than in Lyrical Rap sample, the pitch range and speech intensity were not. Although the pitch ranges showed greater variations in the first sample, this turned

out to be insignificant in the analysis because the standard deviation was relatively high. This statistical problem can be resolved in the future by taking a larger sample of tracks into account.

6. Discussion

This study shows that there may be a system to the way mumble rappers produce speech in their tracks. The significant difference with lyrical rappers in pitch levels and pronunciation accuracy suggest that they rap with more emotion in their voices. This conclusion is based on Polzin & Waibel's (1998) findings related to the effect of emotion on the pronunciation accuracy, and the many intonation studies that have been done over the last decades. The result of this academic focus is a very detailed picture of what emotional speech sounds like and which vocal parameters give the best insight into this. The question that this research tries to answer is if Mumble Rap is a phenomenon that can be explained with this theoretical framework. Mumble rappers are maybe not necessarily in a state of more emotion when they rap, but it could well be that their way of speaking gives prominence to their voice expression over their lexicon. The rapid rise of the genre and growing number of mumble rappers suggest that they either all imitate each other, or that they portray a way of speaking that is natural in their life. The latter can explain the fact that the pioneers of Mumble Rap all come from the same region of the United States, and is thus more likely.

The results of this study give no unambiguous answer to the posed question, but they can function as a starting point of research into this development of AAVE. Hip-hop fits in this field as it has proven to be a valid representation of speech and language in many studies into variances of AAVE (Richardson, 2006). Hip-hop music gives insight into communities of black America, and has an endless repository of speech which is constantly updated with new music from new artists. The need for further research is strong when researchers want to keep up to date in explaining phenomena of a lexical or para-linguistic nature. The unexpected findings regarding the correlation between introspective rap tracks and monotonous intonation is an example of the opportunities hip-hop studies offer. The limitations this study has encountered are hence relevant in light of providing insight into AAVE phenomena with future research.

A few obstacles may have had an influence on validity of the outcome of the study. The selection of the sample turned out to be complicated as there was a limited amount of

tracks available on the internet from which the beat was removed, i.e. had an acapella version. This caused a problem as not every preselected track had such a version. The selection then had to be changed and the approach was reversed. First, the search for acapella versions of hiphop tracks was done, and these were subsequently labelled as belonging to either one of the two categories. This process was very time-consuming albeit the results still gave a representative sample.

An obvious explanation can be given to account for the lack of a significant relation between the rap categories and the average intensity. Contemporary music is the result of a production process rather than an audio fragment that was recorded in the same stretch of time as actual tracks. Record companies and producers can alter voices and sounds in any way possible, and do this to such an extent that rappers and singers always sound clean and pure. This has no consequences for the measurement of the average pitch levels and pitch range, but it does negatively affect the validity of the intensity measurement. The tracks are all bordering on the same volume so that listeners do not have to change the radio volume every time a song switches. The voices are thus incomparable to recorded studio material of experiments, which are frequently conducted in studies on voice characteristics. Feasible results of the analysis of intensity levels are thus not expected when dealing with music in general.

The acapella versions of the selected tracks were also not entirely consistent in the quality of the audio. Record companies and artists do not always make vocals-only files available, which encourages fans to manually construct these themselves. Some vocals were less clear than others then, but this should not have had any effect on the analysis apart from a possible interference with the intensity measurement.

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Appendix #1

The sample selection has resulted in ten tracks which will be analysed in two ways as stated before. This appendix will show the full analysis of the pronunciation of the ten rap tracks. The lyrics and pronunciation of five tracks from the category 'Lyrical Rap' and five tracks from the category 'Mumble Rap' are phonetically compared to the standard American pronunciation (AmE). The analysis will show the number of segmental deletions in the rap styles. Vowel relaxations such as *hed* into *'hedid* occur in both styles and are natural in informal speaking, so they will not be counted as segmental deletions. Similarly, instances of consonant-end dropping, such as *filɪŋ* into *filn*, will not be analysed as segmental deletion as *ŋ*-dropping is common in AAVE. They are no indicators of mumbling for that reason. A standard AAVE transcriber is not available at this point, so the transcriptions of the verses will be according to Standard American English (AmE) with the help of <https://tophoneitics.com/>.

#1 J Cole - Forbidden Fruit (*Self-promotion*)

Ey yo, I walked through the valley of the shadow of death
When niggas hold tec's like they mad at the ref
That's why I keep a cross on my chest, either that or a vest
Do you believe that Eve had Adam in check?
And if so, you gotta expect to sip juice
From the forbidden fruit and get loose
Cole is the king, most definite
My little black book thicker than the Old Testament
Niggas pay for head but the pussy sold separate
Same bitch giving brains to the minister
The same reason they call Mr. Cee "the finisher"
Forbidden fruit, watch for the Adam's apple
Slick with words don't hate me, son
What you eat don't make me shit
And who you fuck don't make me cum
Put a price on my head won't make me run
Try to kill me but it can't be done
Cause my words gon' live forever
You put two and two together Cole here forever

Standard AmE:

eɪ joʊ, aɪ wɔkt θru ðə 'væli ʌv ðə 'ʃæ,dou ʌv dɛθ
wɛn nɪgəz hoʊld teks laɪk ðeɪ mæd æt ðə rɛf
ðæts waɪ aɪ kɪp ə krɔs ʌn maɪ tʃɛst, 'ɪðər ðæt ɔr ə vɛst

Pronunciation:

wɔk [1s]
≠
≠

du ju br'liv ðæt iv hæd 'ædəm ɪn tʃɛk?	br'li [1s]
ænd ɪf sou, ju 'gætə ɪk'spekt tu sɪp dʒus	≠
frʌm ðə 'fɔrbɪdən frʊt ænd gɛt lus	≠
kouɪ ɪz ðə kɪŋ, moust 'dɛfənət	mouʊs [1s]
maɪ 'ɪtəl blæk buk 'θɪkər ðæn ði ouɪld 'tɛstəmənt	ouɪl [1s]
nɪgəz peɪ fɔr hɛd bʌt ðə 'pʊsi souɪld 'sɛprət	≠
seɪm brɪtʃ 'gɪvɪŋ breɪnz tu ðə 'mɪnəstər	gɪŋ [2s]
ðə seɪm 'rɪzən ðeɪ kɔl 'mɪstər si: "ðə 'fɪnɪʃər"	fɪnɪʃə[1s]
'fɔrbɪdən frʊt, wʌtʃ fɔr ði 'ædəmz 'æpəl	≠
slɪk wɪð wɜrdz doʊnt heɪt mi, sʌn	doʊn [1s]
wʌt ju ɪt doʊnt meɪk mi ʃɪt	doʊn [1s]
ænd hu ju flʌk doʊnt meɪk mi kʌm	doʊn [1s]
pʊt ə praɪs ʌn maɪ hɛd woʊnt meɪk mi rʌn	≠
traɪ tu kɪl mi bʌt ɪt kænt bi dʌn	≠
kʌz maɪ wɜrdz gon' ɪv fə'revər	≠
ju pʊt tu ænd tu tə'gɛðər kouɪ hir fə'revər	≠

Conclusion

The pronunciation deviates from the model transcription with 10 segmental deletions. This, however, is below the standard of calling it a Mumble Rap, as there are 19 lines in this verse. The track is thus labeled as a Lyrical rap.

#2 Eminem - Mockingbird (*Introspection*)

Hailie I know you miss your mom and I know you miss your dad
 Well I'm gone but I'm trying to give you the life that I never had
 I can see you're sad, even when you smile, even when you laugh
 I can see it in your eyes, deep inside you want to cry
 Cause you're scared, I ain't there?
 Daddy's with you in your prayers
 No more crying, wipe them tears
 Daddy's here, no more nightmares
 We gon' pull together through it, we gon' do it
 Laney uncles crazy, ain't he?
 Yeah but he loves you girl and you better know it
 We're all we got in this world
 When it spins, when it swirls
 When it whirls, when it twirls
 Two little beautiful girls
 Lookin' puzzled, in a daze
 I know it's confusing you
 Daddy's always on the move, mama's always on the news
 I try to keep you sheltered from it but somehow it seems
 The harder that I try to do that, the more it backfires on me

All the things growing up his daddy that he had to see
 Daddy don't want you to see but you see just as much as he did
 We did not plan it to be this way, your mother and me
 But things have gotten so bad between us
 I don't see us ever being together ever again
 Like we used to be when we were teenagers
 But then of course everything always happens for a reason
 I guess it was never meant to be
 But it's just something we have no control over and that's what destiny is
 But no more worries, rest your head and go to sleep
 Maybe one day we'll wake up and this will all just be a dream

Standard AmE:

Pronunciation:

Heɪli aɪ nou ju mɪs juər mɑm ænd aɪ nou ju mɪs juər dæd	juə [1s]
wel aɪm ɡɔn bʌt aɪm 'traɪɪŋ tu ɡɪv ju ðə laɪf ðæt aɪ 'nevər hæd	juə [1s]
aɪ kæn si juər sæd, 'ɪvɪn wɛn ju smaɪl, 'ɪvɪn wɛn ju læf	ju [1s]
aɪ kæn si ɪt ɪn juər aɪz, dɪp ɪn'saɪd ju wʌnt tu kraɪ	juə [1s]
kɑz juər skɛrd, aɪ eɪnt ðɛr?	≠
'dædɪz wɪð ju ɪn juər prɛrɪz	juə [1s]
nou mɔr 'kraɪɪŋ, waɪp ðɛm tɛrɪz	≠
'dædɪz hɪr, nou mɔr 'haɪt,mɛrɪz	≠
wɪ ɡɔn' pʊl tə'ɡɛðər θru ɪt, wɪ ɡɔn' du ɪt	tə'ɡɛðə [1s]
'leɪni 'ʌŋkəlz 'kreɪzi, eɪnt hɪ?	≠
jæ bʌt hɪ ʌvz ju ɡɜrl ænd ju 'bɛtər nou ɪt	≠
wɪr ɔl wɪ ɡʌt ɪn ðɪs wɜrld	≠
wɛn ɪt spɪnz, wɛn ɪt swɜrlz	≠
wɛn ɪt wɜrlz, wɛn ɪt twɜrlz	≠
tu 'ɪtəl 'bjutəfəl ɡɜrlz	≠
'ʊkɪn 'plæzəld, ɪn ə deɪz	≠
aɪ nou ɪts kən'fjuːzɪŋ ju	≠
'dædɪz 'ɔl,wɛɪz ʌn ðə muv, 'mɑmɪz 'ɔl,wɛɪz ʌn ðə nuz	≠
aɪ traɪ tu kɪp ju 'fɛltəd frʌm ɪt bʌt 'sʌm,həʊ ɪt si:mz	≠
ðə 'hɑrdər ðæt aɪ traɪ tu du ðæt, ðə mɔr ɪt 'bæk,faiərz ʌn mi	≠
ɔl ðə θɪŋz 'ɡrouɪŋ ʌp hɪz 'dædi ðæt hɪ hæd tu si	≠
'dædi daʊnt wʌnt ju tu si bʌt ju si dʒʌst æz mʌtʃ æz hɪ dɪd	≠
wɪ dɪd nʌt plæn ɪt tu bi ðɪs weɪ, juər 'mʌðər ænd mi	≠
bʌt θɪŋz hæv 'ɡʌtən sou bæd brɪ'twɪn ʌs	≠
aɪ daʊnt si ʌs 'ɛvər 'biɪŋ tə'ɡɛðər 'ɛvər ə'ɡɛn	≠
laɪk wɪ juːd tu bi wɛn wɪ wɜr 'ti,neɪdʒərz	≠
bʌt ðɛn ʌv kɔrs 'ɛvri,θɪŋ 'ɔl,wɛɪz 'hæpənɪz fɔr ə 'rɪzən	≠
aɪ ɡɛs ɪt wʌz 'nevər mɛnt tu bi	≠
bʌt ɪts dʒʌst 'sʌmθɪŋ wɪ hæv nou kən'troul 'oʊvər ænd ðæts	≠
wʌt 'dɛstəni ɪz	≠

bʌt noʊ mɔr 'wɜrɪz, rɛst jʊər hɛd ænd goʊ tu slɪp	mɔ [1s]
'meɪbi wʌn deɪ wɪl weɪk ʌp ænd ðɪs wɪl ɔl dʒʌst bi ə drɪm	≠

Conclusion:

The perceived pronunciation is close to the model AmE pronunciation. A few differences have been observed in the pronunciation of the word 'yours'. These count as segmental deletions, and with the adding of the other few occurrences of this phenomenon, this verse of the song *Mockingbird* counts a total of 7 segmental deletions. The track is thus rightfully selected for the category of Lyrical Rap based on these findings.

#3 Dr. Dre ft. Snoop Dogg - The Next Episode (Dr. Dre's verse only) (*Drugs*)

Straight off the fuckin streets of C-P-T
 King of the beats you ride to em in your Fleet (Fleetwood)
 Or Coupe DeVille rollin on dubs
 How you feelin whoopty whoop nigga whut?
 Dre and Snoop chronic'ed out in the 'llac
 With Doc in the back, sippin on 'gnac (yeah)
 Clip in the strap, dippin through hoods (what hoods?)
 Compton, Long Beach, Inglewood!
 South Central out to the Westside (wessyde)
 It's California Love, this California bud got a nigga gang of pub
 I'm on one, I might bail up in the Century Club
 With my jeans on, and my team strong
 Get my drink on, and my smoke on
 Then go home with, somethin to poke on (whassup bitch?)
 Loc it's on for the two-triple-oh
 Comin real, it's the next episode...

Standard AmE:

Pronunciation:

streɪt ɔf ðə fʌkɪn strɪts ʌv si-pi-ti	≠
kɪŋ ʌv ðə bɪts ju raɪd tu ɛm ɪn jʊər flɪt ('fli,twʊd)	≠
ɔr kup də'vɪl 'rɑɪn ən dʌbz	≠
haʊ ju fɪn wʊptɪ: wʊp nɪgə wʊt?	≠
Dreɪ ænd snʊp kronɪk'd aʊt ɪn ði 'læk	≠
wɪð dʌk ɪn ðə bæɪk, sɪpɪn ən 'njæk (jæ)	≠
klɪp ɪn ðə stræp, dɪpɪn θru hʊdz (wʌt hʊdz?)	≠
'kɑmptən, lɔŋ bɪtʃ, 'ɪŋɡəl,wʊd!	≠
sauθ 'sɛntɹəl aʊt tu ðə 'wɛst'saɪd (wesaid)	≠
ɪts ˌkælə'fɔrnjə ʌv, ðɪs ˌkælə'fɔrnjə bʌd gʌt ə nɪgə gæŋ ʌv pʌb	≠
aɪm ən wʌn, aɪ maɪt beɪl ʌp ɪn ðə 'sɛntʃəri klʌb	≠
wɪð maɪ dʒɪnz ən, ænd maɪ tɪm strɔŋ	≠
ɡɛt maɪ drɪŋk ən, ænd maɪ smʊk ən	≠
ðɛn goʊ hoʊm wɪð, sʌmθɪn tu poʊk ən (wasup bɪtʃ?)	wɪ [1s]

Lak its an fɔr ðə tu-'trɪpəl-ou	≠
Cɔmin riəl, its ðə nekst 'ɛpə,souɪd...	'ɛpə,sou [1s]

Conclusion:

This track matches the model AmE pronunciation almost perfectly, apart from 2 instances of segmental deletion in the last three lines. It is categorised as a Lyrical Rap for this reason.

#4 Outkast - Rosa Parks (Andre 3000's verse only) (*Sex/Love*)

I met a gypsy and she hipped me to some life game
 To stimulate then activate the left and right brain
 Said baby boy you only funky as your last cut
 You focus on the past your ass'll be a has what
 that's one to live by or either that one to die to
 I try to just throw it at you determine your own adventure
 Andre, got to her station here's my destination
 She got off the bus, the conversation lingered in my head for hours
 Took a shower kinda sour cause my favorite group ain't coming with it
 But I'm with ya you cause you probably going through it anyway
 But anyhow when in doubt went on out and bought it
 Cause I thought it would be jamming but examine all the flawsky-wawsky
 Awfully, it's sad and it's costly, but that's all she wrote
 And I hope I never have to float in that boat
 Up shit creek it's weak is the last quote
 That I want to hear when I'm going down when all's said and done
 And we got a new joe in town
 When the record player get to skipping and slowing down
 All yawl can say is them niggas earned that crown but until then

Standard AmE:	Pronunciation:
aɪ mɛt ə 'dʒɪpsi ænd ʃi hɪpt mi tu sʌm laɪf geɪm	≠
tu 'stɪmjə,leɪt ðɛn 'æktə,veɪt ðə lɛft ænd raɪt breɪn	≠
sɛd 'beɪbi bɔɪ ju 'oʊnli 'fʌŋki æz juər læst kʌt	kʌ [1s]
ju 'foʊkəs an ðə pæst juər æs'l bi ə hæz wʌt	wʌ [1s]
ðæts wʌn tu lɪv baɪ ɔr 'iðər ðæt wʌn tu daɪ tu	wʌ [1s]
aɪ traɪ tu dʒʌst θrou ɪt æt ju də'tɜrmən juər oʊn æd'ventʃər	θou [1s]
'ʌn,dreɪ, gʌt tu hɜr 'steɪʃən hɪrz maɪ ,dɛstə'neɪʃən	≠
ʃi gʌt ɔf ðə blʌs, ðə ,kʌnvər'seɪʃən 'ɪŋgərd ɪn maɪ hɛd fɔr 'aʊərz	≠
tʊk ə 'ʃaʊər 'kɪndə 'saʊər kʌz maɪ 'feɪvərɪt grʊp eɪnt 'kʌmɪŋ wɪð ɪt	≠
bʌt aɪm wɪð ja ju kʌz ju 'prəbeɪbli 'gouɪŋ θru ɪt 'ɛni,weɪ	≠
bʌt 'ɛni,haʊ wɛn ɪn daʊt wɛnt an aʊt ænd bʌt ɪt	wɛn [1s]
kʌz aɪ θɔt ɪt wʊd bi 'dʒæmɪŋ bʌt ɪg'zæmɪn ɔl ðə flʌski-wʌski	≠
'ʌfli, ɪts sɛd ænd ɪts 'kʌstli, bʌt ðæts ɔl ʃi rouɪt	≠

ænd aɪ hoʊp aɪ 'nɛvər hæv tu flaʊt ɪn ðæt baʊt	≠
ʌp ʃɪt kɪk ɪts wɪk ɪz ðə læst kwəʊt	≠
ðæt aɪ wɑnt tu hɪr wɛn aɪm 'gəʊɪŋ daʊn wɛn ɔlz sɛd ænd dʌn	≠
ænd wɪ gʌt ə nu dʒoʊ ɪn taʊn	≠
wɛn ðə 'rɛkəd 'pleɪər gɛt tu 'skɪpɪŋ ænd 'sləʊɪŋ daʊn	≠
ɔl ɪəl kæn seɪ ɪz ðɛm nɪgəz ʒrɪnd ðæt kraʊn bʌt ən'tɪl ðɛn	≠

#5 Drake ft. The Weekend - The Zone (Drake's verse only) (*Self-Promotion*)

Whoa, all these broken hearts on that pole
 Man if pole dancers an art you know how many fuckin' artists I know
 Got some new bills in the mail
 Got some big favours I owe
 Got some good things ahead of me
 When these bad bitches let go
 Well, girl let's go
 Walk your broken heart through that door
 Sit yo sexy ass on that couch
 Wipe that lipstick off of your mouth
 I take it slow
 She in love with my crew
 She said make enough so I can try some
 I thought taking drugs jus' ain't you
 Yeah girl, just be you
 And I do this shit for my hometown
 It being going down it ain't new
 That's that north north, that up top
 That O-V-O and that X-O
 Your girlfriend at our next show
 But it's all good, don't stress though
 First night fuck, never really planned it
 Take a deep breath, no need to panic
 Lips so French, ass so Spanish
 You don't really like attention, I don't know if she gon' manage out here
 But she got me all up in my zone
 Said she like the view I got in this place
 Shit I did all of that on my own

Standard AmE:

Pronunciation:

wəʊ, ɔl ðɪz 'brəʊkən hɑrts ʌn ðæt poʊl	≠
mən ɪf poʊl 'dænsərz ən ɑrt ju noʊ	≠
haʊ 'mɛni 'fʌkɪn 'ɑrtɪsts aɪ noʊ	≠
gʌt sʌm nu bɪlz ɪn ðə meɪl	≠
gʌt sʌm bɪg feɪvərz aɪ oʊ	≠
gʌt sʌm guɔd θɪŋz ə'hɛd ʌv mi	ʌ [1s]

wɛn ðiz bæd 'bɪtʃɪz lɛt goʊ	≠
wɛl, gɜrl lɛts goʊ	≠
wɔk juər 'brʊkən hɑrt θru ðæt dɔr	dɔ [1s]
sɪt juʊ 'sɛksi æs ʌn ðæt kaʊtʃ	≠
waɪp ðæt 'ɪp,stɪk ɔf ʌv juər maʊθ	juə [1s]
aɪ teɪk ɪt sloʊ	≠
ʃɪ ɪn ʌv wɪð maɪ kru	≠
ʃɪ sɛd meɪk ɪ'nʌf soʊ aɪ kæn traɪ sʌm	≠
aɪ θɔt 'teɪkɪŋ drʌgz dʒu eɪnt ju	≠
jæ gɜrl, dʒʌst bi ju	≠
ænd aɪ du ðɪs ʃɪt fɔr maɪ 'hoʊm,taʊn	≠
ɪt 'biɪŋ 'goʊɪŋ daʊn ɪt eɪnt nu	eɪn [1s]
ðæts ðæt nɔrθ nɔrθ, ðæt ʌp tʌp	≠
ðæt oʊ-vi-oʊ ænd ðæt ɛks-oʊ	≠
juər 'gɜrl,frɛnd æt 'aʊə nɛkst ʃou	'aʊə [1s]
bʌt ɪts ɔl guð, doʊnt strɛs ðoʊ	≠
fɜrst naɪt fʌk, 'nɛvər 'rɪli plænd ɪt	plænd [1s]
teɪk ə dip brɛθ, noʊ nid tu 'pænɪk	≠
lɪps soʊ frɛntʃ, æs soʊ 'spænɪʃ	≠
ju doʊnt 'rɪli laɪk ə'tɛnʃən, aɪ doʊnt	≠
noʊ ɪf ʃɪ gon' 'mænədʒ aʊt hir	hi [1s]
bʌt ʃɪ gʌt mi ɔl ʌp ɪn maɪ zoʊn	≠
sɛd ʃɪ laɪk ðə vju aɪ gʌt ɪn ðɪs pleɪs	≠
ʃɪt aɪ dɪd ɔl ʌv ðæt ʌn maɪ oʊn	≠

Conclusion:

This verse has 29 lines that show 7 instances of segmental deletion. It is categorised as a Lyrical Rap track.

#6 Migos - T-shirt (*Self-Promotion*)

Nineteen ninety-five (nineties), two thousand five (two-thousands)
 Seen it with my eyes (seen it), dope still alive (dope)
 Real mob ties (mob), real frog eyes (frog)
 Real whole pies (whoa), all time high (high)
 Do it for the culture (culture), they gon' bite like vultures (vultures)
 Way back when I was trappin' out Toyotas (skrr, skrr)
 I'ma hit the gas (gas), twelve can't pull me over (twelve)
 Space coupe, Quavo Yoda, pourin', drankin' sodas

I get high on my own, sir, heard you gon' clone sir
 Stop all that flexin', young nigga don't wanna go there
 Never been a gopher (no) but I always been a soldier

Young niggas in the cut, posted like a vulture
 Divin' off the stage in the crowd, it's a mosh pit
 Yeah, shawty bad but she broke cause she don't own shit
 Mama asked me "Son, when the trappin' gon' quit?"
 I been ridin' round through the city in my new bitch

Standard AmE

naɪn'tɪn 'naɪnti-faɪv ('naɪntɪz),
 tu 'θaʊzənd faɪv (tu-'θaʊzəndz)
 sɪn ɪt wɪð maɪ aɪz (sɪn ɪt),
 doʊp stɪl ə'laɪv (doʊp)
 riəl məb taɪz (məb),
 riəl fræg aɪz (fræg)
 riəl hoʊl paɪz (woʊ),
 ɔl taɪm haɪ (haɪ)
 du ɪt fɔr ðə 'kʌltʃər ('kʌltʃər),
 ðeɪ gon' baɪt laɪk 'vʌltʃərz ('vʌltʃərz)

weɪ bæ k wɛn aɪ wʌz 'træpɪn aʊt ,
 tɔɪ'outəz (skrr, skrr)
 l'ma hɪt ðə gæ s (gæ s),
 twɛlv kənt pʊl mi 'oʊvər (twɛlv)
 speɪs kup, Quavo Yoda,
 'pɔrɪn, 'dræŋkɪn 'soʊdəz
 aɪ gɛt haɪ ʌn maɪ oʊn, sɜr,
 hɜrd ju gon' kloun sɜr
 stɑp ɔl ðæt 'flɛksɪn,
 jʌŋ nɪgga doʊnt 'wʌnə goʊ ðər
 'nɛvər bɪn ə 'goʊfər (noʊ)
 bʌt aɪ 'ɔlweɪz bɪn ə 'soʊldʒər
 jʌŋ nɪggas ɪn ðə kʌt,
 'poʊstɪd laɪk ə 'vʌltʃər
 'daɪvɪn ɔf ðə steɪdʒ ɪn ðə kraʊd,
 ɪts ə mɔʃ pɪt
 jæ, shawty bæd
 bʌt ʃɪ broʊk kʌz ʃɪ doʊnt oʊn ʃɪt

'mʌmə æskt mi "sʌn,
 wɛn ðə 'træpɪn gon' kwɪt?"
 aɪ bɪn 'raɪdɪn raʊnd θru
 ðə 'sɪti ɪn maɪ nu brɪtʃ

Pronunciation

naɪn'ti 'naɪni-faɪv ('naɪntɪz)
 tu 'θaʊzən faɪv (tu-'θaʊzəndz) [3s]
 sɪn ɪ wɪ maɪ aɪz (sɪn ɪ),
 doʊp stɪl ə'laɪv (doʊp) [3s]
 riəl mə taɪz (mə),
 riəl fræg aɪz (fræ) [3s]
 riəl hoʊl paɪz (woʊ)
 ɔl taɪm haɪ (haɪ) [1s]
 du ɪ fɔ ðə 'kʌltʃə ('kʌltʃə)
 ðeɪ gon' baɪ laɪ 'vʌltʃəz ('vʌltʃəz)
 [s4s]

weɪ bæ wɛ aɪ wʌz 'træpɪn aʊt
 tɔɪ'outəz (skrr, skrr) [2s]
 l'ma hɪt ðə gæ s (gæ s)
 twɛl kæn pʊl mi 'oʊvə (twɛl) [4s]
 speɪs ku, Quavo Yoda
 pɔrɪ, 'dræŋkɪ 'soʊdəz [3s]
 aɪ gɛ haɪ ʌn maɪ oʊn, sɜr,
 hɜrd ju gon' kloun sɜr [1s]
 stɑ ɔl ðæt 'flɛksɪ,
 jʌŋ nɪgga doʊn 'wʌnə goʊ ðər [4s]
 'nɛvə bɪn ə 'goʊfə (noʊ)
 bʌt aɪ 'ɔlweɪz bɪn ə 'soʊldʒər [2s]
 jʌŋ nɪggas ɪn ðə kʌ
 'poʊstɪd laɪk ə 'vʌltʃər [1s]
 'daɪvɪn ɔf ðə steɪdʒ ɪn ðə kraʊd,
 ɪts ə mɔʃ pɪ [1s]
 jæ, shawty bæ
 bʌt ʃɪ broʊk kʌz ʃɪ doʊn oʊn ʃɪ
 [3s]
 'mʌmə æst mi "sʌ,
 wɛn ðə 'træpɪn gon' kwɪt?" [3s]
 aɪ bɪn 'raɪdɪn raʊn θu
 ðə 'sɪti ɪn maɪ nu brɪtʃ [2s]

Conclusion:

The perceived pronunciation deviates from the model AmE pronunciation as expected from the selection. There are 16 lines in this verse that show 40 occurrences of segmental deletions in the pronunciation, which validates the track as a Mumble Rap.

#7 Chief Keef ft. Nervo - Champagne (*Introspection*)

You don't owe me anything, thought you should know that
All the shit you've put up with, girl, I deserve a toe tag
Sunny days, clear skies, rainy days, cold nights
You was there for me when I was snowed in, you know that I know right
But tonight's your night (bang, bang)
You was with me when the po put you and me in the coupe
You the only girl that can get a nigga in a suit
Drop top riding 'cause you're so exotic
You won't reply to gold 'cause you're like a diamond (skrt skrt)
We can go out shopping, pop tags
Since we got assistants we can leave the mall without bags
Take me to the time that we first met
Take me to the time that we first met

Standard AmE:

ju daʊnt ɒ mi 'ɛni,θɪŋ,
θɔt ju ʃʊd noʊ ðæt
ɔl ðə ʃɪt juv pʊt ʌp wið,
gɜrl, aɪ dɪ'zɜrv ə toʊ tæg
'sʌni deɪz, klɪr skaɪz,
'reɪni deɪz, koʊld naɪts
ju wʌz ðɛr fɔr mi wɛn aɪ wʌz snoʊd ɪn,
ju noʊ ðæt aɪ noʊ raɪt
bʌt tə'naɪts juər naɪt (bæŋ, bæŋ)
ju wʌz wið mi wɛn ðə poʊ
pʊt ju ænd mi ɪn ðə kup
ju ði 'oʊnli gɜrl ðæt kæn
gɛt ə nɪgə ɪn ə sut
drʌp tʌp 'raɪdɪŋ kɛz
jʊr soʊ ɪg'zʌtɪk
u woʊnt rɪ'plaɪ tu goʊld
kɛz jʊr laɪk ə 'daɪmənd
wi kæn goʊ aʊt 'ʃʌpɪŋ, pʌp tægz
sɪns wi gʌt ə'sɪstənts
wi kæn liv ðə mɔl wɪ'θaʊt bægz

Pronunciation:

ju daʊn ɒ mi 'ɛni,θɪŋ,
θɔt ju ʃʊd noʊ ðæ [2s]
ɔl ðə ʃɪt juv pʊt ʌ wɪ,
gɜrl, aɪ dɪ'zɜrv ə toʊ tæ [3s]
'sʌni deɪz, klɪr skaɪz,
reɪni deɪz, koʊl naɪts [1s]
ju wʌz ðɛr fə mi wɛn aɪ wʌz snoʊ ɪn
ju noʊ ðæt aɪ noʊ raɪ [3s]
bʌt tə'naɪts juə naɪ (bæŋ, bæŋ) [2s]
ju wʌz wið mi wɛn ðə poʊ
pʊt ju æn mi ɪn ðə kup [1s]
ju ði 'oʊnli gɜrl ðæt kæn
gɛt ə nɪə ɪn ə su [3s]
drʌp tʌ 'raɪdɪŋ kɛz
jʊr soʊ ɪg'zʌtɪ [2s]
u woʊn rɪ'plaɪ tu goʊl
kɛz jʊr laɪ ə 'daɪməŋ [4s]
wi kæn goʊ aʊ 'ʃʌpɪ, pʌp tæz [3s]
sɪns wi gʌt ə'sɪstənts
wi kæn liv ðə mɔl wɪ'θaʊ bæz [2s]

teɪk mi tu ðə taɪm ðæt wi fɜrst mæt

teɪk mi tu ðə taɪm ðæt wi fɜrst mæt

teɪk mi tu ðə taɪm ðæ wi fɜrst mɛ
[2s]

teɪk mi tu ðə taɪm ðæ wi fɜrst mɛ
[2s]

Conclusion:

The verse contains 13 rap lines in which a total of 30 segmental deletions occur. The track is thus labeled as a Mumble Rap track.

#8 Future - Mask Off (*Drugs*)

Two cups, toast up with the gang
From food stamps to a whole 'nother domain
Out the bottom, I'm a livin' proof (Super)
They compromising, half a million on the coupe
Drug houses, lookin' like Peru
Graduated, I was overdue
Pink Molly, I can barely move
Ask about me, I'm gon' bust a move
Rick James, 33 chains
Ocean air, crusin' Biscayne
Top off, that's a liability
Hit the gas, boostin' my adrenaline

Standard AmE:

tu kʌps, tɔʊst ʌp wɪð ðə gæŋ
frʌm fud stæmps tu ə hoʊl 'nʌðər doʊ'meɪn

aʊt ðə 'bɑtəm, aɪm ə 'lɪvɪn pru:f ('supər)

ðeɪ 'kæmprəˌmaɪzɪn, hæf ə 'mɪljən ən ðə kup

drʌg 'haʊsəz, 'lʊkɪn laɪk pə'ru
'grædʒuˌeɪtɪd, aɪ wʌz 'oʊvər'du
pɪŋk 'mɒli, aɪ kæn 'berli muv
æsk ə'baʊt mi, aɪm gon' bʌst ə muv
rɪk dʒeɪmz, 33 tʃeɪnz
'oʊʃən ɛr, 'kruzɪn brɪ'skeɪn
tɒp ɔf, ðæts ə ˌlaɪə'bɪlɪti
hɪt ðə gæs, 'bustɪn maɪ ə'drenələn

Pronunciation:

tu kʌps, tɔʊst ʌ wɪ ðə gæ [4s]
frʌm fu stæmps tu ə hoʊl 'nʌðə doʊ
'meɪ [3s]

aʊt ðə 'bɑtə, aɪm ə 'lɪvɪ pru ('supə)
[4s]

ðeɪ 'kæmprəmaɪzi, hæf ə 'mɪljən ə ðə ku
[3s]

drʌ 'haʊsəz, 'lʊkɪ laɪk pə'ru [s2]
grædʒuˌeɪtɪ, aɪ wʌz 'oʊvər'du [1s]
pɪŋk 'mɒli, aɪ kæn 'berli mu [2s]
æsk ə'baʊ mi, aɪm gon' bʌst ə mu [2s]
rɪk dʒeɪz, 33 tʃeɪz [2s]
'oʊʃən ɛr, 'kruzɪn brɪ'skeɪ [1s]
tɒp ɔ, ðæs ə ˌlaɪə'bɪlɪti [2s]
hɪt ðə gæ, 'bustɪn maɪ ə'drenələ [2s]

Conclusion

The first verse of this tracks counts 13 lines in which 28 instances of segmental deletion occur. The pronunciation is significantly different from the model AmE pronunciation and is therefore rightfully labled as a Mumble Rap track.

#9 Usher ft. Young Thug - No Limit (Young Thug's verse only) (*Sex/Love*)

You finer than wine
Baby girl I ain't lying
Make my homies drop a dime
Commit a crime
Jeopardize my lifeline
Just to see your vital sign
Ain't no limit, babe we do it larger
Ain't no limit babe when you a starter
Martyr outsmart the 'Rari, 'Rari
Fill the session with Bacardi Barbies
Kerosene, kerosene
Promise spin, washing machine
Thin waisted primadonna
Never limit, I'm a stoner
Tinted out, them never rentals
Fuck them boys, they always get us
Bottle and rag denim
I'mma spend my night with 'dem
I could put karats all over you
Karats all over you
Never mind, we only poppin' shit
Man I been getting high with these fools
And she said all her friends fake, was solo rocking
And she a real bad bad bitch, she ain't gotta Photoshop it

Standard AmE:

ju 'faɪnər ðæn waɪn
'beɪbi gɜrl aɪ eɪnt 'laɪɪŋ
meɪk maɪ hɑmɪs drɑp ə daɪm
kə'mɪt ə kraɪm
'dʒɛpər,daɪz maɪ 'laɪ,flaɪn
dʒʌst tu si juər 'vɑɪtəl saɪn
eɪnt nou 'lɪmət, beɪb wi du ɪt 'lɑdʒər

eɪnt nou 'lɪmət beɪb wɛn ju ə 'stɑrtər

Pronunciation:

ju 'faɪnər ðæn wai [1s]
beɪbi gɜrl aɪ eɪn 'laɪ [3s]
meɪk maɪ homɪ drɑp ə daɪ [2s]
kə'mɪt ə kraɪm [1s]
'dʒɛpə,daɪ maɪ 'laɪ,fla [4s]
dʒʌs tu si juə 'vaɪtə saɪ [4s]
eɪn nou 'lɪmə, beɪ wi du ɪt 'lɑdʒə
[4s]
eɪn nou 'lɪmə beɪ wɛn ju ə 'stɑtə
[4s]

'mɑrtər 'aʊt,smɑrt ði 'Rɑri, 'Rɑri
fɪl ðə 'sɛʃən wɪð bə'kɑrdi 'bɑrbɪz
'kɛrəsɪn, 'kɛrəsɪn, 'prɑməs spɪn, 'wɑʃɪŋ mə'ʃɪn

θɪn 'weɪstɪd prɪmədɒnɑ
'nɛvər 'lɪmət, aɪm ə 'stəʊnər
'tɪntɪd aʊt, ðəm 'nɛvər 'rɛntəlz
fɹk ðəm bɔɪz, ðeɪ 'ɔl,weɪz gɛt ʌs
'bɑtəl ænd ræg 'dɛnəm
ɑ'mə spɛnd maɪ naɪt wɪð 'dɛm
aɪ kʊd pʊt 'kɛrəs ɔl 'oʊvər ju
'kɛrəs ɔl 'oʊvər ju
'nɛvər maɪnd, wɪ 'oʊnli 'pɑpɪn ʃɪt
mən aɪ bɪn 'gɛtɪŋ haɪ wɪð ðɪz fulz
ænd ʃɪ sɛd ɔl hɜr frɛndz feɪk, wɹz 'soʊ,loʊ 'rɑkɪŋ

ænd ʃɪ ə rɪəl bæd bæd bɪtʃ,
ʃɪ eɪnt 'gɑtə 'foʊtəʊʃlɑp ɪt

Conclusion

The pronunciation deviates from the model pronunciation very strongly. The artist is known as one of the pioneers of Mumble Rap, which this verse shows as it contains segmental deletions in every line, adding up to a total of 62 instances in 23 lines of the verse.

Conclusion:

The verse shows 4 instances of segmental deletion and is thus close to the model pronunciation. It is labeled as a Lyrical rap for this reason.

#10 Lil Yachty ft. Kyle - I Spy (Yachty's verse only) (*Self-Promotion*)

She said she 21, I might have to I.D. that
All my bitches come in pairs like balls in my nutsack
I remember ridin' around the city in a hatchback
Lookin' for a problem with my young goblins
I'mma send a model home with her neck throbbin'
I done made so much money that it's non-stoppin'
Got my brothers on my back like the last name
I remember tellin' everyone I couldn't be tamed
Woah, six months later I had snapped and now I'm in the game
Went from fake chains to diamonds in another lane
Went from "Can you take me here?" to screening out the lane
Went from "Damn this nigga lame" to remember my name

'mɑrtə 'aʊ,smɑrt ði 'Rɑri, 'Rɑri [2s]
fɪl ðə 'sɛʃən wɪ bə'kɑrdi 'bɑrbɪz [1s]
'kɛrəsɪn, 'kɛrəsɪn,
'prɑməs spɪn, 'wɑ mə'ʃɪn [3s]
θɪn 'weɪstɪ prɪmədɒnɑ [1s]
'nɛvə 'lɪmə, aɪm ə 'stəʊnə [3s]
'tɪnɪd aʊt, ðəm 'nɛvə 'rɛtəlz [3s]
fɹk ðəm bɔɪz, ðeɪ 'ɔl,ɛz gɛt ʌs [2s]
'bɑtəl æn ræ 'dɛm [3s]
ɑ'mə spɛnd ma naɪt wɪ 'dɛm [2s]
aɪ kʊ pʊt 'kɛrəs ɔl 'oʊvə ju [3s]
'kɛrəs ɔl 'oʊvər ju [2s]
'nɛvə maɪn, wɪ 'oʊli 'pɑpɪ ʃɪt [4s]
mən aɪ bɪn 'gɛtɪŋ haɪ wɪð ði fulz [2s]
æn ʃɪ sɛd ɔl hɜ frɛnz feɪ, wɹz 'soʊ
,loʊ 'rɑkɪ [3s]
æn ʃɪ ə rɪəl bæ bæ bɪtʃ
ʃɪ eɪn 'gɑtə 'foʊtəʊʃlɑp ɪ [4s]

So I remember all the people who ain't fucked with me
 They went to college, now all them niggas is history
 Upgraded from gold to diamonds in my teeth
 Riding deep in the van, like we lookin' for a mystery (Raggy!)
 So don't fuck with me, no, lately I been livin' life luxury
 Boat and Kyle stick together like piano keys
 And on my mother's mother I won't fuck a bitch without a damn rubber

Standard AmE:

ʃi sɛd ʃi twɛnti wʌn, aɪ maɪt hæv
 tu aɪ.di. ðæt
 ɔl maɪ 'bɪtʃɪz klʌm ɪn pɜr z laɪk
 bɔlz ɪn maɪ nʌtsæk
 aɪ rɪ'mɛmbər 'raɪdɪn ə'raʊnd
 ðə 'sɪti ɪn ə 'hæʃbæk
 'lʊkɪn fɔr ə 'prɒbləm
 wɪð maɪ jʌŋ 'gæblɪnz
 l'mə sɛnd ə 'mɒdəl hoʊm
 wɪð hɜr nek 'θrəbɪn
 aɪ dʌn meɪd soʊ mʌtʃ 'mʌni
 ðæt ɪts 'hʌŋstapɪn
 gʌt maɪ 'brʌðəz ʌn maɪ
 bæ k laɪk ðə læst neɪm
 aɪ rɪ'mɛmbər 'tɛlɪn 'ɛvri,
 wʌn aɪ 'kʊdənt bi teɪmd

Wʊ, sɪks mʌnθs 'leɪtər aɪ hæd
 snæpt ænd naʊ aɪm ɪn ðə geɪm
 wɛnt frʌm feɪk tʃeɪnz tu '
 daɪmɛndz ɪn ə'nʌðər leɪn
 wɛnt frʌm "kæn ju teɪk mi hɪr?"
 tu 'skrɪŋ ʌʊt ðə leɪn
 wɛnt frʌm "dæm ðɪs nɪgə leɪm"
 tu rɪ'mɛmbər maɪ neɪm
 soʊ aɪ rɪ'mɛmbər ɔl ðə 'pɪpəl
 hu eɪnt flʌkt wɪð mi
 ðeɪ wɛnt tu 'kʌlɪdʒ,
 naʊ ɔl ðɛm nɪgə ɪz 'hɪstəri
 əp'greɪdɪd frʌm goʊld
 tu 'daɪmɛndz ɪn maɪ tiθ
 'raɪdɪŋ dɪp ɪn ðə væn,
 laɪk wi 'lʊkɪn fɔr ə 'mɪstəri
 soʊ doʊnt flʌk wɪð mi, noʊ,

Pronunciation:

ʃi sɛ ʃi twɛtɪ wʌn, aɪ maɪt hæv
 tu aɪ.di. ðæ [4s]
 ɔl maɪ 'bɪtʃɪz klʌm ɪn pɜr z laɪk
 bɔlz ɪn maɪ nʌtsæ [1s]
 aɪ rɪ'mɛmbə 'raɪdɪ 'raʊn
 ðə 'sɪti ɪn ə 'hæʃbæ [5s]
 'lʊkɪn fɔr ə 'prɒbləm
 wɪð maɪ jʌŋ 'gæblɪ [2s]
 l'mə sɛn ə 'mɒdəl hoʊm
 wɪð hɜr nɛ 'θrəbɪn [2s]
 aɪ dʌn meɪ soʊ mʌtʃ 'mʌni
 ðæt ɪts 'hʌŋstapɪ [2s]
 gʌt maɪ 'brʌðr z ʌn maɪ
 bæ k laɪk ðə læs neɪ [3s]
 aɪ rɪ'mɛmbə 'tɛlɪn 'ɛvri,
 wʌn aɪ 'kʊd'n bi teɪm [4s]

Wʊ, sɪks mʌns 'leɪtə aɪ hæd
 snæt æn naʊ aɪm ɪn ðə geɪm [4s]
 wɛn frʌm feɪk tʃeɪz tu '
 daɪmɛnz ɪn ə'nʌðə leɪn [3s]
 wɛnt frʌm "kæn ju teɪk mi hɪ?"
 tu 'skrɪŋ ʌʊt ðə leɪn [3s]
 wɛnt frʌm "dæm ðɪs nɪgə leɪm"
 tu rɪ'mɛmbə maɪ neɪ [2s]
 soʊ aɪ rɪ'mɛmbə ɔl ðə 'pɪpəl
 hu eɪn flʌk wɪ mi [3s]
 ðeɪ wɛn tu 'kʌlɪdʒ,
 naʊ ɔl ðɛm nɪgə ɪz 'hɪstəri [1s]
 əp'greɪdɪd frʌm goʊl
 tu 'daɪmɛnz ɪn maɪ ti [4s]
 raɪdɪ dɪp ɪn ðə væn,
 laɪk wi 'lʊkɪn fɔr ə 'mɪstəri [1s]
 soʊ doʊ flʌk wɪ mi, noʊ,

'leɪtli aɪ bɪn 'lɪvɪn laɪf 'lʌgzəri
 ɒʊt ænd kaɪl stɪk
 tə'gɛðər laɪk pi'ænəʊ kɪz
 ænd ʌn maɪ 'mʌðəz 'mʌðər
 aɪ wəʊnt flʌk ə bɪtʃ wɪ'θaʊt ə dæm 'rʌbər

'leɪtli aɪ bɪn 'lɪvɪn laɪf 'lʌgzəri [3s]
 ɒʊt æn kaɪl stɪk
 tə'gɛðər laɪk pi'ænəʊ kɪz [2s]
 æn ʌn maɪ 'mʌðəz 'mʌðə
 aɪ wəʊn flʌk ə bɪtʃ wɪ'θaʊt ə dæm 'rʌbə
 [4s]

Conclusion:

The 19 lines of Lil Yachty's verse show 53 instances of segmental deletion and is thus categorised as a Mumble Rap track.