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AMBITIONZ AZ A RIDAH

2Pac's changing accent and flow in light of regional variation in
African-American English speech and hip-hop music

STEVEN GILBERS

university of
 groningen

The work in this thesis has been carried out under the auspices of the Center for Language and Cognition Groningen (CLCG) of the Faculty of Arts of the University of Groningen.

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AMBITIONZ AZ A RIDAH

2Pac's changing accent and flow in light of regional variation in
African-American English speech and hip-hop music

PhD thesis

to obtain the degree of PhD at the
University of Groningen
on the authority of the
Rector Magnificus Prof. C. Wijmenga
and in accordance with
the decision by the College of Deans.

This thesis will be defended in public on

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INTRODUCTION

“Oh yeah, you’re right! ‘Cause you could tell the articulation from the [Tupac] videos you watched. Yo, Steve, nobody ever said that, but that’s the first time I ever heard a convo like that. I never heard that before in my life. That’s gonna be special.”

– Erick Sermon (EPMD/Def Squad)

0.1 “First off...”

Sometime in early 2014, as I was struggling to come up with a topic for my linguistics master’s thesis, I threw on a 2Pac record. It was his posthumous 1997 album *R U still down? (Remember me)*, and when the record’s fifth song – “Thug style” – came on, it stopped me dead in my tracks. The song starts off with 2Pac mimicking the types of criticisms that he would often receive around the time of recording (November 1994):

“Fuck 2Pac, that nigga¹ ain’t shit. Nigga ain’t from mu’ fucking New York. Nigga be out there with them Cali niggas.”

– “Yo nigga, man, fuck ‘Pac. That nigga West Coast.”

– “Nigga ain’t fuck with us, always with them New York niggas. Seen him with that nigga, man? That nigga ain’t from the West Coast.”

In his own voice, he then continues, “I guess I ain’t East Coast enough for my niggas back in New York, and I ain’t West Coast for these niggas on the West, huh?” In that moment, something clicked in my head, as if a light switch had been turned on all of a sudden: 2Pac – real name Tupac Amaru Shakur – was not only one of the most prolific, iconic, and tragic figures in hip-hop history, he must have also been a second regional dialect learner. As a native speaker of African-American English (AAE), 2Pac grew up in the East Coast AAE dialect region (mostly New York City and a few years in Baltimore) before moving to AAE’s West Coast dialect region at age 17 (first to the Bay Area and later to Los Angeles). On top of that, 2Pac moved to a second dialect region in a cultural context in which great value is attached to authenticity and to one’s regional origin and affiliation. As a prominent figure in hip-hop, this meant that people – as evident from the intro to “Thug style” – constantly questioned 2Pac’s regional identity, especially when he became involved in the violent mid-1990s regional hip-hop feud between the West Coast and East Coast hip-hop scenes. Interestingly enough, AAE linguists like Morgan (1993, 1998, 2001, 2002) had reported that hip-hop community members are aware of the accent differences between different AAE regiolects and that they even consciously employ their regions’ distinct accent features to represent for their home region. The

¹ Although I, as a white man studying African-American language and culture, never use the n-word in my own speech or writing, I have chosen to print the n-word uncensored throughout this dissertation in quotes from interviews and song lyrics in order to present these quotes as authentically as possible.

dots started connecting at this point, and I had found the research question for my thesis: what happened to 2Pac's accent when he moved from the East Coast to the West Coast, and how was his accent development affected by the fact that towards the end of his life, despite originally being from New York City, he became the de facto leader of West Coast hip-hop in a feud with the East Coast hip-hop scene?

I soon realized that the scope of my master's thesis – which found that as time progressed, 2Pac's /æ/ vowels had gradually become longer (i.e., more West Coast-like) and more variable (indicative of an unstable, changing language system) before an explosive increase could be observed in the rate of change towards (and beyond) West Coast AAE vowel duration norms when he began feuding with East Coast hip-hop (Gilbers, 2015) – was not nearly big enough to come even close to figuring out what happened to 2Pac's speech over time, and that far more work was required to answer my main research question. For one, despite all the great research that had been conducted on AAE already, we still knew very little about the differences between West Coast AAE and East Coast AAE, let alone in the context of hip-hop culture, meaning I would need to establish baselines for the ways in which West Coast and East Coast AAE differ from each other regarding multiple accent variables. It also became apparent to me that answering this question would require the integration of multiple perspectives, theoretical frameworks, and academic fields. A combination of insights from sociolinguistic theory and from language development theories like Exemplar Theory and Complex Dynamic Systems Theory would be required to predict and explain what happened to the speech of an individual in a situation as complicated as 2Pac's. Moreover, I would need to look not only at the way West Coast AAE speech and East Coast AAE speech are measurably distinct from each other, but also how the two regiolects are *perceived* to be different in order to better understand why the acquisition of certain accent features may develop in a different manner than the acquisition of others. And finally, the project would need to bridge the gap between the fields of sociophonetic dialectology, second language/dialect acquisition research, hip-hop studies, and even musicology, because I also became interested in finding out whether there was a relationship between the speech and music from the West Coast and the East Coast, and whether 2Pac's music had developed in similar ways as his accent had. As such, my master's thesis served as a pilot to a PhD project which argued for an integrated approach to studying second dialect acquisition in an AAE/hip-hop context. A PhD project that allowed me to research my two main interests in life together: language and hip-hop. A PhD project in hip-hop linguistics – a field

pioneered by scholars such as H. Samy Alim, Marcyliena Morgan, Renée Blake, and Cecelia Cutler – which has resulted in the dissertation you are currently reading.

0.2 Theoretical background

As hinted at in the previous section, this doctoral dissertation makes use of several theoretical frameworks and perspectives to answer its research questions. This section introduces the most important ones of these. Firstly, Exemplar Theory, Complex Dynamic Systems Theory and sociolinguistic work on how people's language development can be affected by extralinguistic factors like motivation, language attitudes, and feelings of identity are discussed in light of the integrated approach to second dialect acquisition that forms the backbone of this PhD project. It then briefly outlines the literature on a possible language-music connection before diving into the work that's been done on accent perception. The discussion of the integrated approach is the most extensive of the three, because while this approach forms the backbone of the PhD project, it is never discussed in great detail in any of the research chapters of the dissertation, which only touch on it briefly and refer back to Gilbers (2015) for a more fleshed out discussion instead. Since the dissertation *does* feature detailed discussions of the literature on the language-music connection (Chapters 3 and 5) and accent perception (Chapter 4), these are only briefly discussed here.

0.2.1 Integrated approach to phonological second dialect acquisition

Pierrehumbert, Beckman, and Ladd state that “theories which unify results from many methods are more robust and more predictive, on the average, than those based on fewer methods” (2000, p. 280). It is the principle underlying this observation that lies at the core of the integrated approach to phonological second language and second dialect acquisition that was proposed in Gilbers (2015), an approach which can be considered the theoretical starting point of the present dissertation. This approach makes use of Exemplar Theory principles to predict the direction of linguistic development, Complex Dynamic Systems Theory principles and tools to describe diachronic change as well as explain and predict variation, and sociolinguistic insights to explain and predict a learner's rate of accent change over time.

In order to properly contextualize the studies reported on in this dissertation (especially chapters 1 and 5), the present subsection offers a brief discussion of the

strengths and weaknesses of the integrated approach's individual parts (when applied exclusively). This is followed by a concise description of how these three perspectives can function together.

0.2.1.1 Exemplar Theory

Exemplar Theory (ET) is a psychological approach which offers an account of the workings of human perception and categorization. It proposes that each stimulus one encounters will be stored in memory, and that, upon perception, each instance – or ‘exemplar’ – is compared to earlier stored exemplars and subsequently categorized according to its similarity to these. Highly similar exemplars are grouped together in “clouds” and are separated from more dissimilar instances, which are themselves grouped in other exemplar clouds in the cognitive landscape. Within each cloud, the recorded instances of a category indicate the range of variation that is displayed in the category (Pierrehumbert, 2001).

In linguistics, ET has been shown to be highly applicable to the study of speech sound category development from a usage-based perspective (e.g., Johnson, 1997; Pierrehumbert, 2001, 2003, 2006; Wedel, 2004). The size and makeup of category exemplar clouds is determined by the degree of variation displayed in the instances of the speech sounds someone has encountered, and with each new perceived exemplar, the nature of its respective cloud in the cognitive landscape is altered slightly. Each perceived token carries a wide array of information (e.g., regarding spectral quality, duration, pitch, and part of which word it was), and all of this information is stored in said person's memory.² Not every exemplar or exemplar cloud is deemed equally significant, however. The degree of importance assigned to exemplars and exemplar clouds – their strength – is dependent on factors such as recency (the more recent, the stronger) and frequency of occurrence (the more frequent, the stronger). Due to recency effects, exemplar clouds' locations on the cognitive map may shift away from the location of its older tokens and in the direction of the location of its newer exemplars (Pierrehumbert, 2001, 2006), and due to frequency effects, certain exemplar clouds may be more salient than others (e.g., Valkenier & Gilbers, 2013).

² In this respect, ET significantly diverges from generative models of phonological representation (e.g., Chomsky & Halle, 1968), which argue for minimally specified underlying phonological representations, holding that all articulatory variation derives from one such representation per lexical item (Nycz, 2013a).

Considering the importance of factors such as frequency and recency in an ET account of people's speech sound perception and production, the theory is highly suitable for research on second language and second dialect phonology acquisition regarding acquisition through immersion. In such a context, ET predicts that as exposure to a new language's or dialect's speech sounds increases, the exemplars of the new language or dialect will gradually become more prominent due to their increased frequency and their relative recency compared to the older exemplars from the first language. As such, the person's exemplar clouds will gradually assimilate towards the speech sound norms of the new language or dialect, a development which should be apparent from gradual assimilation towards the new norms in the respective person's production.

ET is informed by the ambition of providing a comprehensive account of language development. The ET proponent Pierrehumbert, for instance, states that her ET-based model's aim is to "[specify] all and only the outcomes which are possible in human language" (2001, p. 139), and that ET is capable of predicting which outcomes of language development are possible and which are not. However, this is not entirely the case, as illustrated by empirical evidence from second language acquisition research. For example, ET cannot easily account for the increase in variation often brought to light by diachronic studies of second language learners' speech production (De Bot, Lowie & Verspoor, 2007). Moreover, ET may be able to explain and predict gradual intraindividual assimilation as stemming from the exemplars of the new dialect or language becoming relatively more prominent compared to those of the first dialect or language, but it cannot explain why second dialect/language learners sometimes overshoot or hypercorrect rather than assimilate (i.e., pronounce a vowel more extremely than the exemplars their minds have stored), a phenomenon that is common in second dialect/language learners' speech (e.g., Foreman, 2003; Schmid, Gilbers & Nota, 2014). In fact, ET would predict that this is an impossible scenario, for it assumes that phonetic targets for production must be selected from the exemplars available in the cloud of exemplars (Pierrehumbert, 2001). This example shows that, on its own, ET does not offer a complete account of language development.

0.2.1.2 Complex Dynamic Systems Theory

Complex Dynamic Systems Theory (CDST), a theory of developmental psychology originating from a mathematical construct, holds that complex, dynamic systems are marked by a complete interconnectedness of their variables as they change over time, meaning that if a change occurs in a single variable, this will affect all of the

system's other variables in some way. Moreover, given the iterative nature of interacting components over time, relatively small changes in initial conditions can lead to major changes at later points in time, which is why CDST holds it is principally impossible to predict systems' exact courses of development.

In the context of its application to language development, CDST is most notable for its dismissal of the traditional nativist argument that language development is a teleological process, arguing there is no such thing as a steady end state of development (Thelen & Smith, 1994). Instead, CDST favors a usage-based account of language development that involves a trial-and-error dynamic to arrive at new developmental stages. CDST advocates studying language development (e.g., De Bot et al., 2007; Larsen-Freeman, 1997) are all concerned with intraindividual variability in production over time, for at the foundation of the CDST approach lie the notions that fluctuations in variability over time are indicative of fluctuations in a system's instability, that (temporary) instability is a requirement for development to occur (Hosenfeld, Van der Maas & Van der Boom, 1997), and that increased variability implies a process of potentially non-linear, qualitative developmental change (Lee & Karmilof-Smith, 2002). It is argued that there is always a certain degree of random variability in production, but that variability is significantly larger at times of rapid developmental change when new strategies and behavior are explored in a trial-and-error fashion (De Bot, Chan, Lowie, Plat & Verspoor, 2012; Thelen & Smith, 1994). Rapid developmental change, then, is argued to be the result of the emergence of so-called "attractor states", relatively steady developmental stages that systems are drawn towards and where they settle before another attractor state emerges (De Bot et al., 2007).

Due to its broad, all-encompassing scope with a focus on detail and variability, CDST has been called the most comprehensive of all developmental theories (Miller, 2010), and has been proposed as a candidate for an overall theory of language development (e.g., De Bot et al., 2007), with its proponents arguing that CDST represents a paradigm shift (e.g., De Bot, 2015).³ However, in spite of its attention for detail – or, rather, *because* of it – CDST cannot be considered a full-fledged candidate for an overall theory of language development yet, as it currently does not fulfill an important requirement for a theory to be successful (as argued by Pierrehumbert et al., 2000), namely that a theory should be predictive and falsifiable.

³ Of course, variation also plays a central role in ET, but CDST looks at variation from a different perspective: it considers increased levels of variability as the symptom of an unstable linguistic system and as a requirement for qualitative language development.

For this reason, CDST has been described as a metatheory of language, which is falsifiable in principle but unlikely to be falsified (Hulstijn, 2020). Apart from the fact that CDST predicts language contact will cause instability in people's language systems and hence increased variability in their production, a fundamental CDST approach does not allow for the level of abstraction that is necessary for comprehensive prediction to be possible.

0.2.1.3 Sociolinguistic dimension

The descriptions of ET and CDST above deal almost exclusively with passive, linguistic aspects of language development, but this is arguably only one side of the coin; while second language acquisition and second dialect acquisition must be constrained by aspects of the linguistic system, social factors also play a significant role (Nycz, 2013a). Sociolinguistic approaches to second language acquisition and second dialect acquisition are concerned with the latter and hence study the issue by looking at the circumstances under which people acquire their new language varieties. Strongly interconnected extralinguistic factors such as motivation, language attitudes, feelings of identity, and speakers' (desired) positions within their speech communities profoundly impact the process of people's language developments (e.g., Chambers, Trudgill & Schilling-Estes, 2002; Eckert, 2006; Waninge, Dörnyei & De Bot, 2014). A desire to belong to the speech community of the language variety to be acquired will positively affect motivation to acquire the variety and may hence cause a faster acquisition process, whereas negative attitudes and a desire to stay in touch with the learner's first variety's community may have a stalling effect. The incorporation of a sociolinguistic dimension can thus be considered a crucial requirement for achieving a comprehensive understanding of the workings of language development, as without it, only half of the issue is explored.⁴

0.2.1.4 Interaction between approaches

The key observation to be made from the sections on ET, CDST, and sociolinguistic insights regarding second language and second dialect phonology acquisition above

⁴ It is important to note here that CDST does acknowledge extralinguistic factors as being part of the larger dynamic system of language development. However, on the basis of this acknowledgment alone, such extralinguistic factors cannot be incorporated sufficiently in descriptions or predictions of language development. For this, the additional detail provided by a sociolinguistic dimension is required.

is that neither of these can provide a full account of language development by themselves. While ET allows for prediction of language development with a focus on variability in production, it does not acknowledge variation as a symptom of and requirement for developmental change the way that CDST does. Moreover, it has trouble accounting for overshooting effects that have been observed in the literature and, on its own, ET is not perfectly suited to take human agency into account as a full-fledged factor influencing developmental trajectories. As mentioned, CDST does take into account fluctuations in variability by interpreting them as signs of fluctuations in stability. However, because of its attention to detail and its philosophy that developmental change is reliant on the interplay between a potentially infinite number of variables, the theory is not particularly well-suited for forming predictions. This hinders it from being considered a comprehensive theory of language development, should one follow the notion that theories should be predictive and falsifiable. The sociolinguistic dimension considers extralinguistic factors such as human agency in much greater detail, but on its own does not offer the insights into the fundamental cognitive processes at play that ET and CDST do. Together, however, the three dimensions complement each other, their individual strengths neutralizing the others' weaknesses, resulting in a more comprehensive theory of language development than each of them individually could be.

0.2.2 Language-music connection

One of the pillars of this PhD project is that it analyzes language together with music, both from a dialectological perspective (Chapter 3) and from a second dialect acquisition perspective (Chapter 5). These studies are grounded in the idea that an intricate connection exists between the domains of language and music. Although prior to the present PhD project, this supposed connection between language and music had never been investigated in the context of AAE regiolects and hip-hop, there is a substantial amount of work on this connection for other linguistic and musical contexts. Perhaps most notably, Patel, Iversen, and Rosenberg (2006) showed that the pattern along which British English and French differed from each other regarding prosodic melody and rhythm was reflected in the way classical music from England and France differed from each other regarding melodic interval variability and rhythmic diversity: British English speech *and* classical music were more rhythmically and more melodically variable than their French counterparts. Patel et al. (2006)'s findings have been replicated various times in different linguistic and musical contexts, suggesting that there is indeed a strong link between language and music when it comes to regional variation. However, there are a few

counterexamples (e.g., Temperley, 2017), and none of the previous studies have looked at language varieties as similar as West Coast and East Coast AAE, nor have they looked at a type of vocal music with such a strong focus on rhythm and a non-traditional approach to melody. Another missing link in the literature is the second dialect acquisition angle. Before this PhD project, no one had diachronically analyzed how someone acquires a second musical dialect, let alone in conjunction with an analysis of that same individual's acquisition of a second linguistic dialect.

0.2.3 Accent perception

The majority of this dissertation takes a speech (or rap) production-centered approach, but in Chapter 4, AAE regional variation in a hip-hop context is approached from the listener's perspective. Hence, the dissertation draws from accent perception research, for instance on linguistic profiling (e.g., Purnell, Idsardi, & Baugh, 1999; Alim & Smitherman, 2012; Holliday & Jagers, 2015; Holliday & Villareal, 2018) and work on how listeners' perception of speech may or may not directly correspond to the findings from acoustic speech analyses. A growing body of work suggests that there is no one-to-one relationship between speech production and speech perception (e.g., Drager, 2010; Evans & Iverson, 2007; Schmid, Gilbers, & Nota, 2014; Thomas, 2000) and that listeners do not pay equal attention to each "cue" for identifying someone's regional origin in the speech signal (Clopper & Pisoni, 2004; Drager, 2010). AAE regional variation has hardly been studied from a perceptual perspective, meaning that before this PhD project, we had no clear idea nor evidence of how well listeners can actually distinguish between AAE regiolects such as West Coast and East Coast AAE. This is a serious gap in the literature because if listeners cannot perceive the difference between two varieties or can only perceive a subset of the differences between them, it raises the question of how relevant acoustic analyses of these differences actually are. Another reason for including a perceptual dimension is that it plays a role in second language and second dialect acquisition: people acquiring a second language or dialect often struggle with accent features they cannot perceive and are thus unaware of (Best, 1995; Flege, 1995). As such, if we know which accent features of a given variety are salient to listeners and which are not, we can make better predictions about the course of their second language/dialect acquisition and better interpret the findings from speech production studies.

0.3 Overview of the dissertation

The main part of this dissertation comprises a collection of research articles, each representing a separate study conducted in light of my PhD project. As such, there is some overlap between the chapters (mainly in their introduction sections), as they were originally written to be stand-alone articles for other publications. Aside from the main part's five articles, the dissertation also features an extra article at the end, as if the dissertation were the special edition of a music album with bonus cuts included. This final article was incorporated as a bonus rather than main article because even though it deals with hip-hop linguistics and was written and published during the course of my PhD project, it is not related to the dissertation's central research questions. The dissertation ends with an appendix featuring a timeline of notable events in 2Pac's life as well as a near-comprehensive timeline of when he recorded his music. Below, an outline of this dissertation's chapters will be presented along with a brief discussion of the content of each chapter.

0.3.1 Chapter 1: The linguistic and lyrical development of 2Pac in relation to regional hip-hop identity and conflict

Chapter 1, which was previously published as a chapter (Gilbers, 2018a) in the edited volume *The sociolinguistics of hip-hop as critical conscience: Dissatisfaction and dissent* (Ross & Rivers, 2018), introduces the reader to hip-hop's competitiveness and fierce territorialism, outlining various hip-hop feuds, especially the ones related to regional origin and affiliation. In its discussion of hip-hop's infamous East Coast/West Coast feud of the mid-1990s, it pays special attention to the role that 2Pac played in this conflict. In light of this, a selection of 2Pac lyrics from before he got involved in the conflict is compared to lyrics he recorded during his involvement in the feud, showing how 2Pac distanced himself from his native East Coast and overtly aligned himself with West Coast hip-hop culture through his lyrical content. It then connects these findings to the results of Gilbers (2015), which analyzed the development of 2Pac's /æ/ vowel duration in both a voiceless and sonorant postvocalic context between 1988 (the year he moved from the East Coast to the West Coast) and 1996 (the year of his death) on a yearly basis using an integrated approach that combines ET, CDST, and various sociolinguistic insights. As hypothesized using the integrated approach's CDST dimension, 2Pac's /æ/ vowel duration became increasingly variable over time, suggesting that exposure to a new dialect's accent features destabilized his language system. As predicted by

the integrated approach's ET dimension, the vowel duration data also show a gradual increase in /æ/ vowel duration until 1995. This gradual assimilation was followed by a strong increase in the rate of change from 1995 onward. The latter was hypothesized using the integrated approach's sociolinguistic dimension, which predicted that due to changing extralinguistic factors (i.e., 2Pac's (assumed) desire to belong to West Coast hip-hop's speech community from 1995 onward), 2Pac would make a conscious attempt to sound more West Coast-like, findings which were in line with the pattern of development observed for 2Pac's lyrical content.

0.3.2 Chapter 2: African-American English regiolects and hip-hop: Comparing East Coast and West Coast vowel duration

Chapter 2 is a short intermediate chapter which establishes proper baselines for West Coast AAE and East Coast AAE /æ/ vowel duration based on the speech of 20 male native speakers of AAE who are prominent figures in hip-hop (10 from the West Coast and 10 from the East Coast). It follows the exact same method for measuring vowel duration that was used in the Gilbers (2015) study reported on in the previous chapter. The results of the study show clear evidence that West Coast AAE /æ/ vowels in a voiceless or sonorant postvocalic context are significantly longer than East Coast AAE /æ/ vowels. Thus, the study acts in support of the study on 2Pac's /æ/ vowels discussed in Chapter 1, while also offering further quantitative support for previous claims by authors like Morgan (1993, 1998, 2001, 2002) and Cutler (2007, 2014) with regards to West Coast AAE and East Coast AAE vowel length (i.e., that West Coast AAE vowels are longer than East Coast AAE vowels on average).

0.3.3 Chapter 3: Regional variation in West and East Coast African-American English prosody and rap flows

Chapter 3, which I wrote with the assistance of Nienke Hoeksema, Kees de Bot, and Wander Lowie, was previously published as a research article in *Language and Speech* (Gilbers et al., 2019a/2020). It explores how West and East Coast AAE are distinct from each other with regards to variation in prosodic melody and rhythm, how West Coast and East Coast rap styles (i.e., 'flows') differ from each other with regards to melodic and rhythmic variation, and whether these regional differences patterned in similar ways for both domains. As such, the study is both linguistic and musicological in nature. The study's findings indicate that West Coast AAE is more

melodically variable and more rhythmically variable than East Coast AAE, a dialectological difference between these two varieties which had never been observed before. Regarding music, the results show that West Coast rap flows are more melodically variable and rhythmically variable than East Coast rap flows. Regional variation in music was thus found to follow the same pattern as regional variation in speech, which is why the findings of the study add to the literature on a possible connection between language and music, especially considering the fact that rap had previously never been investigated in light of this language-music connection. The article also adds to the literature by introducing a new methodology for quantitatively analyzing rhythmic and melodic variation in speech and rap. A novel semitone-based scale was created to compare melodic variability in speech and (a capella) rap recordings, and using tools originally designed for digital music production, a MIDI-based method was created for analyzing microtiming and rhythmic variability in rap flows.

0.3.4 Chapter 4: Regional African-American English accent perception in a hip-hop context

Chapter 4 is a research article that reports on an accent perception study I conducted at New York University (NYU; supervised by Renée Blake) and at the University of California, Los Angeles (UCLA; supervised by H. Samy Alim) supported by a Fulbright visiting scholar grant. It aims to answer the question of how well listeners can identify whether a speaker is from the East Coast or the West Coast purely on the basis of their speech. It also takes a folk linguistic perspective, exploring the ways in which listeners believe the West Coast and East Coast AAE accents are distinct from each other, or which features are most salient to them when listening to a speaker while trying to determine their regional origin. The perception study was conducted by means of an online survey, in which participants were presented speech recordings from 16 male native speakers of AAE that are prominent figures in hip-hop (8 from the West Coast and 8 from the East Coast). The recordings were presented in an anonymized round (voices pitched up by 5 semitones) first and unaltered in a second round. Participants were asked to listen to these recordings and note whether they believed the recording's speaker was from the West Coast or from the East Coast and how sure they were of their assessment. They were also asked to write down whether anything about a given recording stood out to them, and at the end of the survey, they were asked to reflect on their assessments, indicating what they believed they had listened for in order to form their decisions. The participants performed better than chance when identifying speakers' regional

backgrounds, with AAE native speakers outperforming listeners who were not native speakers of AAE. The majority of participants noted at least a single segmental difference between the two varieties, but the most commonly reported differences were rhythm-related or pitch-related. Notably, participants' reflections on the differences between West and East Coast AAE often did not match with previous phonetic analyses of the two regiolects, which suggests that listeners can hear that the accents are distinct but do not necessarily have conscious knowledge of how they are distinct.

0.3.5 Chapter 5: How 2Pac's prosody and rap flows changed: A case study on linguistic and musical second dialect acquisition

In many ways, Chapter 5 is the culmination of this dissertation and PhD project. It ties together many of the findings from the previous four chapters, and is a direct continuation of the 2Pac case study introduced in Chapter 1. It also acts like a sequel to Chapter 3's study on the link between West Coast and East Coast AAE prosody and flow in terms of rhythmic and melodic variation, as it builds on that study's dialectological findings (both for the domain of language and for the domain of music) and makes use of the new methodologies for analyzing melodic variability, rhythmic variability, and musical microtiming that Chapter 3 introduced. In this way, Chapter 5 is a testament to the fact that Chapter 3's newly introduced methodologies can be applied in another field of research as well, namely that of second dialect acquisition, regardless of whether the acquisition of a second linguistic dialect or of a second musical dialect is being investigated. Returning to 2Pac as a case study subject, Chapter 5 provides a detailed discussion of the artist's life, focusing on events that are or possibly could have been relevant to the way his accent and music developed over time. It then proceeds to uncover what happened to 2Pac's speech prosody and rap flows over time in terms of rhythmic and melodic variation using a much higher temporal resolution than was used for the case study of Chapter 1 (quarterly or even monthly measurements rather than yearly measurements). The results show that both in his speech and in his music, 2Pac's sound changed to become more West Coast-like over time, especially during the time he was signed to the West Coast gangsta rap label Death Row Records and acted like the primary spokesperson for West Coast hip-hop culture. Hence, the findings are in line with those reported in Gilbers (2015) and in Chapter 1, offering support for the idea that 2Pac consciously manipulated his speech and rapping to

sound more like he was from the West Coast, a conclusion which is further supported by comments that 2Pac himself and others have made about his state of mind at given moments and his method acting approach to life and art.

0.3.6 General discussion

The general discussion of this dissertation connects the results of the five research chapters and reflects on the implications of these results for the theoretical frameworks and methodologies used in the PhD project. The first part of this discussion focuses on the findings with regards to regional variation in West Coast and East Coast AAE speech. After that, the findings related to regional variation in West Coast and East Coast rap are considered as well as those related to the language-music connection in a context of AAE and hip-hop. The next part bridges the gap between these dialectological findings (both linguistic and musical) and the development of 2Pac's accent and flow. Subsequently, it is discussed what the implications of this dissertation's findings are for the wide variety of theoretical perspectives and methodologies that were used. On a metalevel, the dissertation's main conclusion is that the best, most insightful research comes from combining multiple methods and theoretical frameworks, and that this PhD project is a testament to that philosophy: the findings of this dissertation could only have been obtained using this combination of highly different theoretical perspectives and methodologies.

0.3.7 Bonus chapter: How the financial crisis changed hip-hop

The final chapter, which was previously published as a chapter (Gilbers, 2018b) in the edited volume *The sociolinguistics of hip-hop as critical conscience: Dissatisfaction and dissent* (Ross & Rivers, 2018), is a bonus chapter of this dissertation because while it is related to hip-hop linguistics and was written and published during the course of this PhD project, it is not connected to this PhD project's central research questions. An expansion of the study reported in Gilbers (2012), the article investigates how the hip-hop community was affected by the financial crisis that lasted from the late 2000s until the early 2010s and how this is reflected in rap lyrics from that era. The article first outlines the historical development of materialism in hip-hop. On the basis of interview data, qualitative analysis of rap lyrics, and quantitative analysis of rap lyrics from a period before and after the onset of the 2008 financial crisis, it concludes that rap lyrics became

less materialistic in the wake of the financial crisis, and that rappers started reflecting on their wealth and material desires more critically than they had done in the period before.

0.3.8 Appendix: 2Pac timeline

In preparation of conducting Chapter 5's diachronic case study on 2Pac's prosody and flow, I created a detailed timeline of notable events in 2Pac's life and career with a focus on when he recorded his music. This timeline, which was pieced together on the basis of a myriad of sources (quotes from interviews that 2Pac and others gave, various 2Pac biographies and documentaries, official Death Row Records documents listing the dates of 2Pac recording sessions, online 2Pac forums, and more) is often accurate to the month or even day. It is near-comprehensive when it comes to 2Pac's musical body of work. I have included this timeline as an appendix to this dissertation because it could be a valuable resource for people looking to conduct their own studies on 2Pac or simply for 2Pac fans who want to get a clear overview of when 2Pac was working on certain projects.

0.4 “My ambitionz az a ridah...”

As far as I am concerned, this book is not the end of this story. There are still dozens of questions I have about 2Pac's linguistic and musical development, about the relationship between speech prosody and rap flows, and about the differences between East Coast and West Coast AAE, just to name a few. Also, this dissertation is not the only result of this PhD project by any means. Over the past few years, I have continuously sought to disseminate my research findings through as many different channels as I could in order to reach people from as many different backgrounds as possible. I was lucky enough to get the chance to travel to places as varied as Helsinki, Cambridge, New York City, Amherst, Bremen, Auckland, Boston, and Los Angeles and talk about my research at conferences or as a guest lecturer. It was also important to me that my research would reach people beyond academia's ivory tower. I have tried to do so through lectures at popular science festivals, by giving interviews about my work that were broadcast or published via various national and international media outlets, and by talking about my research in my own podcasts (Kick Knowledge and Homebase), and I plan to keep doing so in the years to come by means of documentaries and books geared towards a more general audience, for example. In light of this, the outcome of this PhD project that I am perhaps most proud of is that I got a thread about my research on AAE prosody

and rap flows to go viral on Twitter.⁵ At the time of writing, at least 60,000 people came across it, the vast majority of whom weren't involved with academia in any way, and the *Language and Speech* article that the thread promoted has already been read thousands of times as a result. The best thing about sharing your research findings like this is that you receive a plethora of valuable comments and insights, some of which have already inspired new ideas for future studies in my head. This illustrates how valuable it can be to share your research with people who normally would not have any way of accessing it.

That group of people includes the very hip-hop artists that I studied or those close to them as well. Throughout this PhD project, I got the opportunity to talk to a number of well-established rappers like Rakaa Iriscience (Dilated Peoples), Jay Rock, Erick Sermon (EPMD, Def Squad) and Large Professor (Main Source) about my research. For instance, here's an excerpt from my conversation with Erick Sermon (Gilbers & Diaz, 2018a) – a personal acquaintance of 2Pac's – who became consciously aware of something that deep down he had known for decades already, namely that 2Pac's accent changed over time:

STEVEN GILBERS	My research is about how 2Pac's accent, in like his language, how it changed when he moved from the East to the West Coast.
ERICK SERMON	Oh yeah, you're right! 'Cause you could tell the articulation from the videos you watched.
STEVEN GILBERS	Yeah, definitely. It's so interesting, like... So I'm studying it over time from like the moment he moved to the West Coast to like the moment of his death, basically, and I noticed that his accent gradually became a little more West Coast over time...
ERICK SERMON	Yo, Steve, nobody ever said that, but that's the first time I ever heard a convo like that.

⁵ This thread, posted under my Twitter handle @Steven_Gilbers, can be accessed via the following link: bit.ly/ProsodyFlow.

STEVEN GILBERS The cool thing about 2Pac is I could measure on a yearly basis that the moment he starts feuding with East Coast hip-hop and with Biggie and Bad Boy, he starts manipulating his accent in such a way that he sounds more like a West Coast rapper rather than, like, a New Yorker. In the sense that, I guess because, like, it's kind of weird to say, "fuck New York" with a New York accent, you know what I mean? That's basically the basis of my PhD project.

ERICK SERMON I never heard that before in my life. That's gonna be special.

Artists' responses to my work both confirmed my ideas and allowed me to reflect on my data in different ways as well. When I spoke to Large Professor (Gilbers & Diaz, 2018b) – mentor to one of my research subjects (Nas) and a highly accomplished rapper and producer himself – about my research on prosody and flow and how it relates to the differences between West and East Coast hip-hop, he described the New York accent in layman's terms and told me about a reason that rappers from other regions might adopt typical New York accent features which I had not previously considered myself yet:

LARGE PROFESSOR The New York flow is definitely a distinguished one. I mean, it's the original. (...) Rough. I mean, but we've gone through many stages (...) but the foundation is just like that rugged, kind of... 'cause the accent, you know? You know, the accent. You put the accent– we speak hard. So it's like, "yo!" You know, that kind of thing.

STEVEN GILBERS And that comes through in the music, right?

LARGE PROFESSOR Yeah! Really, it does. Because walking the streets, you know, the four-count and everything like that. It's like... I can't describe it, but you're right when you say that Cali had a more melodic, more kind of laid-back, kind of thing.

STEVEN GILBERS Yeah, like you got Snoop, "give me the microphone first, so I can bust like a bubble..."

LARGE PROFESSOR Yeah, yeah, yeah, yeah, right! He's dancing on it! No doubt. But like New York, it's like, "aye, yo, check it out... out... out..." You know, the echoes, and stuff like that. You know, you just get that thing on like, "yaow!" Like, B-Real, you

know, he's from the West also, but he put that thing on his voice that gave him that character where it's like, "yo, yo, yo!" And that's a New York thing right there, so it's like just being the character on the mic kind of thing.

Large Professor's comments on Cypress Hill rapper B-Real's reason to adopt certain features of the New York accent – likely to link himself to the gritty aesthetic associated with New York hip-hop, not because of an apparent desire to represent for any other region than his own (i.e., Los Angeles) – deepened my understanding of why rappers may adopt certain accent features from other regional dialects than their own, an insight I will make sure to incorporate in future research. Sharing my research with people of diverse backgrounds from all over the world and learning from their responses has been the most rewarding aspect of doing this project, and I highly recommend other researchers to do the same. I certainly plan to keep doing so myself.

With that being said, I warmly invite you to read my doctoral dissertation. In the words of 2Pac himself on the last song he ever recorded (Shakur, 1996a), a day before being fatally shot: "let's get it on."

***The linguistic and lyrical development of 2Pac in relation to regional hip-hop identity and conflict**

* Slightly adapted from previously published chapter in *The sociolinguistics of hip-hop as critical conscience: Dissatisfaction and dissent* (Ross & Rivers, 2018).

Gilbers, S. (2018a). The linguistic and lyrical development of 2Pac in relation to regional hip-hop identity and conflict. In A. S. Ross & D. J. Rivers (Eds.), *The sociolinguistics of hip-hop as critical conscience: Dissatisfaction and dissent* (pp. 13-36). Houndmills, UK: Palgrave Macmillan.

1.1 Introduction

From Public Enemy to Jay-Z and from N.W.A to Kendrick Lamar, hip-hop has a rich history of artists using their work to “fight the power”, and few – if any – genres of music can be considered as socio-politically engaged as hip-hop. Following in the footsteps of black political activists such as Malcolm X, Martin Luther King, Jr., and the Black Panthers as well as artists such as The Last Poets and Gil Scott-Heron, rappers have always been the newscasters of “black America’s CNN” (Chuck D, as cited in Thorpe, 1999), voicing their dissent and their dissatisfaction with the treatment of African-Americans and other minorities in society, often in aggressive, provocative tone. As a result of this, there are countless instances of rap songs that criticize police brutality (e.g., N.W.A’s “Fuck tha police”, 1988), racial profiling (e.g., Jay-Z’s “99 problems”, 2003), the war on drugs, governments’ lack of effort to improve living conditions in inner-city neighborhoods (e.g., 2Pac’s “Changes”, 1998), corporate avarice (e.g., Lupe Fiasco’s “Words I never said”, 2011), and any other issue that may negatively affect the (predominantly black) hip-hop community. Nevertheless, some of hip-hop’s most ferocious expressions of dissatisfaction have not targeted politicians, media outlets, or even police; they have been aimed at other rappers. The culture has been marked by conflict among rappers from its inception – which is unsurprising considering hip-hop’s competitiveness and its battle culture – and rappers have squared off with each other on stage, on records, and unfortunately also violently on the streets.

Historically speaking, one of the most prevalent motives for hip-hop conflicts has consistently been regional status. The reason for this is likely that the concepts of region and place are central to hip-hop culture and the identity of its aficionados, who express local pride by, for instance, referencing local customs and places in rap lyrics or by using their regional African-American English (AAE) dialects to highlight linguistic dissimilarities with other regional hip-hop subcultures (Hess, 2009; Morgan, 2001). Regional hip-hop tensions reached their peak after hip-hop had spread from New York to California in the mid-1980s and a strong desire emerged among the new West Coast hip-hop community to challenge New York’s regional hip-hop hegemony. Consequently, when the rappers 2Pac and The Notorious B.I.G. – representing for the West Coast and the East Coast respectively – became embroiled in a personal conflict in 1994, their feud was quickly absorbed into a national conflict which was then further escalated: the infamous 1990s East Coast/West Coast hip-hop war (Forman, 2002). During this conflict, 2Pac came to be the primary avatar of West Coast hip-hop while expressing his grievances with East Coast hip-hop (Hess, 2009). Considering hip-hop’s fundamental concept of

(regional) authenticity (Cutler, 2007), this is quite a striking accomplishment, as 2Pac – ironically enough – was born in New York and did not move to California until he was 17 years old.

This chapter is concerned with examining the sociolinguistic dimension of dissatisfaction and dissent as expressed in regional hip-hop feuds. It does so by exploring from a lyrical as well as a sociolinguistic perspective how 2Pac communicated his allegiance to West Coast hip-hop during the East Coast/West Coast hip-hop war and simultaneously distanced himself from his East Coast roots. The first part of the chapter addresses the importance of region and place to hip-hop culture and the hip-hop community's sense of identity, paying special attention to the role language use plays in this respect. This section is followed by an overview of how different regional hip-hop scenes developed throughout the United States over time as well as a discussion of different types of hip-hop conflicts. This section focuses on hip-hop battles waged over regional status and pays special attention to the infamous East Coast/West Coast hip-hop war of the 1990s and the role that 2Pac played during this conflict. Next, the selection of 2Pac as a case study subject is outlined, followed by an analysis of regional affiliation in 2Pac's rap lyrics, comparing his lyrics from before and during the East Coast/West Coast hip-hop war. Finally, the results of a diachronic study on 2Pac's acquisition of West Coast AAE as a second dialect (Gilbers, 2015)⁶ will be discussed and related to the aforementioned lyrical analysis. It is concluded that 2Pac, who was shown to have made a conscious effort to sound like a 'native speaker' of West Coast AAE during the conflict, communicated the message that he was the quintessential West Coast hip-hop artist through his belligerent anti-East Coast lyrics, but manipulated his accent to lend his message the authenticity and credibility required for it to be accepted by the West Coast hip-hop community.

1.1.1 Regional hip-hop identity in relation to language use

One of the core characteristics of hip-hop culture is its focus on region and place, and the fact that regionality is central to hip-hop community members' identities (Forman, 2002; Hess, 2009; Morgan, 2001). Hess (2009) points out that hip-hop

⁶ This previously published chapter reports on the findings from a previous study (Gilbers, 2015), recontextualizing it in light of regional hip-hop conflicts and the development of 2Pac's lyrical content. For reasons of space, the discussion of that study's theoretical considerations, methodological choices, and interpretation of the results is much more concise than it was in Gilbers (2015). For a more detailed discussion of these matters, please see Gilbers (2015).

community members often feel a great sense of local pride and that this sense of pride causes hip-hop community members to:

... name-check the regions, cities, boroughs, streets, and neighborhoods that they call home (...) whether the broad regions of East Coast, West Coast, Midwest, and Dirty South [Southern hip-hop], or any one of New York City's five boroughs, or even a specific neighborhood. (p. viii)

By doing so, they invoke a social experience that is shared with others from those places, linking one to the respective region's traditions. However, following hip-hop's central concept of authenticity – “keeping it real” – pretending to be from somewhere else than you really are is generally frowned upon and can lead to a loss of reputation or even ostracization (Cutler, 2007; Hess, 2009; Morgan, 2001; Rickford & Rickford, 2000).

Morgan (2001) states that next to referencing local places and landmarks, one of the most important means of expressing regional identity and affiliation is through usage of one's regional AAE variety, arguing that “in [hip-hop] culture, language is not simply a means of communication (...) but is viewed as a series of choices that represent beliefs and have consequences” (p. 190). As Morgan states, when hip-hop was exported across the country during the 1980s, this led to “new speech community formations and a drive to distinguish and articulate linguistic characteristics to represent major cities and regions on the East and West Coasts” (p. 188) as well as the emergence of a “locally marked lexicon” (p. 188). Despite the fact that the differences between regional dialects of AAE are very subtle – so much so in fact that it was long erroneously held by sociolinguists that AAE was spoken in a uniform manner across the United States (e.g., Baugh, 1983; Labov, 1972; Smitherman, 1977), the so-called supraregional myth (Wolfram, 2007) or homogeneity myth (Wolfram & Kohn, 2015) – hip-hop community members are aware of phonological differences between regional dialects of AAE in particular. Moreover, they make use of their regional phonological features to distinguish regional differences, especially with regards to vowel duration, which is relatively short in East Coast AAE and relatively long in West Coast AAE (Cutler, 2007; Gilbers, 2015; Morgan, 1993, 1998, 2001).

1.1.2 Development of regional hip-hop scenes across the United States

Since hip-hop was initially not as widespread as it is today, regionality did not always play as much of a role in hip-hop as it does today. Having emerged from the South Bronx and subsequently invaded New York City's other boroughs during the 1970s, hip-hop was very much New York-oriented: virtually every part of hip-hop culture – from its sounds to its looks and from its slang to its references – was originally dominated by the New York hip-hop community (Hess, 2009). New York's hip-hop hegemony began to wither in the mid-1980s, when hip-hop culture not only spread to other cities on the East Coast but also across the United States to the West Coast. There, a raw interpretation of hip-hop arose that was distinct from New York's: the so-called 'gangsta rap' movement. Influenced by Los Angeles street gang culture's extreme territorialism, a desire emerged among the members of the new West Coast hip-hop community to assert themselves as distinct from the New York hip-hop community that had always dominated the look and sound of the culture (Forman, 2002; Hess, 2009). As Morgan (2001) puts it, "[f]or the first time, the [hip-hop] community had to consciously address whether the emergence of different regional styles constituted a split in the [hip-hop] nation" (p. 193). Such a split in the hip-hop nation did indeed occur in the 1990s, when tensions between the West Coast and the East Coast reached their zenith during the East Coast/West Coast hip-hop war (Forman, 2002; Hess, 2009). By the end of the 1990s, the conflict between the two coasts had receded, and other regions such as the South and the Midwest started gaining popularity as well. They created their own regional styles and cultures (Cutler, 2007) and even managed to take over the East and West Coasts' grip on hip-hop culture. In fact, a Vibe Magazine survey revealed that in 2004, Southern hip-hop artists accounted for 43.6% of the airplay on urban radio stations, Midwest rappers for 29.7%, East Coast rappers for 24.1% and West Coast hip-hop artists for only 2.5% (Sarig, 2007).

1.1.3 Hip-hop conflicts

Hip-hop culture has been characterized by conflicts between rappers from the beginning, which is understandable considering hip-hop's competitive climate in which outdoing one's competitors and gaining respect from your peers may well be among the most important driving forces for many rappers, deejays, graffiti artists, and hip-hop dancers (Hess, 2009). Hip-hop has a longstanding tradition of (freestyle) rap battles, dance offs, and graffiti tagging wars, which are often

aggressive in nature but not necessarily rooted in ill feelings towards competitors on a personal level. However, hip-hop also knows plenty of cases of actual feuds between rappers – so-called ‘beefs’. There have been beefs between rappers for seemingly endless reasons, from feuds over stolen lyrics (e.g., Grandmaster Caz versus Big Bank Hank, the latter of which purportedly plagiarized the former’s lyrics for the 1979 hit song “Rapper’s delight”; Lyubovny, 2014) to feuds over leaving a rap group (e.g., Ice Cube versus his former crew N.W.A; The Breakfast Club, 2014), and from conflicts over crew disloyalty (e.g., 50 Cent versus The Game; Reid, 2005) to a recent strife over allegedly using a ghostwriter (Meek Mill versus Drake; Ramirez, 2015).

Among this diverse array of reasons for rap feuds, there is one type of ‘beef’ that keeps surfacing: hip-hop conflicts over geographic affiliation. As Hess (2009) states, rappers and deejays often appeal to local or regional allegiances among the crowd to get them on their side during battles, adding that “[hip-hop]’s local pride has bred competition between neighborhoods, cities, and even sides of the country, and territoriality has become a topic of several [hip-hop] conflicts over where true [hip-hop] resides” (p. xix). Regional status conflicts can essentially be divided into two categories: conflicts between rappers from the same region (henceforth: intraregional conflicts) and conflicts between rappers from different regions (henceforth: interregional conflicts).⁷

Arguably the most noteworthy intraregional feud in hip-hop history was the so-called King of New York battle between Jay-Z (from the Marcy Projects in Brooklyn) and Nas (from the Queensbridge Projects in Queens), which stemmed from a power vacuum after the 1997 passing of The Notorious B.I.G., the Brooklyn rapper who had previously held the title of “king of New York” (i.e., he was deemed the best and most successful New York rapper). Although there were many reasons for these two New Yorkers to be feuding (for instance, Jay-Z had sampled Nas’s voice on his debut album without permission and claimed to have been with the mother of Nas’s child), the reason Jay-Z started off the battle with Nas – a certain competitor for New York hip-hop’s regal vacancy – was unquestionably to establish himself as the new number one of New York hip-hop. To illustrate, the hook to his “Takeover” (2001) diss record samples the phrase “we run New York” as rapped by

⁷ In this chapter, “intraregional conflicts” and “interregional conflicts” are meant to refer solely to conflicts over regional status, not to conflicts between rappers from the same region or different regions over other types of issues.

KRS One. Nas responded with the vicious song “Ether”, which contains the lyrics “the king – you know you not” and “the king is back, where my crown at?” (2001).

One of the earliest and most memorable interregional hip-hop feuds was the one between Boogie Down Productions from the South Bronx and the Juice Crew from the Queensbridge Houses: the Bridge Wars (Hess, 2009). The feud started because of the latter’s song “The Bridge”⁸ (1986), on which the Juice Crew rapper MC Shan seemed to claim that hip-hop was founded in the Queensbridge Projects rather than in the Bronx. Boogie Down Productions took offense to this claim and, representing for their neighborhood and defending its regional status, responded with the song “The Bridge is over”, on which the group’s leader KRS One raps that the “Bronx keeps creating it, and Queens keeps on faking it” (1987).

1.1.3.1 The East Coast/West Coast hip-hop war

By far the most striking interregional hip-hop conflict – and undoubtedly the most memorable hip-hop conflict overall – was the East Coast/West Coast hip-hop war (Forman, 2002). The conflict originated from New York rappers being frustrated with the West Coast’s dominance over hip-hop during the early 1990s, which made it difficult for East Coast rappers to thrive. The New York rapper Tim Dog first brought these tensions between the two coasts to light in his song “Fuck Compton” (1991),⁹ which triggered a few responses (most notably Dr. Dre’s “Fuck wit Dre day (And everybody’s celebratin’)” and the comedic skit “The \$20 sack pyramid” on his 1992 album *The chronic*). The bicoastal tensions were further fueled during the 1995 Source Awards. As Hess (2009) writes:

A true turning point in the perception of rap music as an East Coast or West Coast thing came with the 1995 Source Awards. [Hip-hop], from its inception, had been fiercely territorial, but this second annual event, held in New York City’s Madison Square Garden on August 3, 1995, brought regional tensions in [hip-hop] to a head. (...) The New York audience members remained loyal to their hometown artists and booed [Snoop Doggy Dogg],¹⁰ one of rap’s biggest stars. Snoop famously responded, his

⁸ *The Bridge* stands for ‘Queensbridge Houses’.

⁹ Compton, California is one of Los Angeles County’s cities, and as the hometown of notable West Coast gangsta rappers (e.g., Eazy-E and Dr. Dre), it is closely linked to West Coast hip-hop (cf. N.W.A’s 1988 album *Straight Outta Compton*).

¹⁰ Calvin “Snoop Doggy Dogg” Broadus – who hails from Long Beach, California – was signed to the West Coast-based label Death Row Records at the time.

voice incredulous, “the East Coast ain’t got no love for Dr. Dre and Snoop Dogg and Death Row?” The audience booed again. (p. xxii)

At those same Source Awards, Marion “Suge” Knight, CEO of the West Coast-based record label Death Row Records, went on stage and subliminally mocked Sean “Puff Daddy” Combs, the founder of Bad Boy Records, which was the most popular East Coast rap label at the time. The attack ignited a rivalry between the two labels and their label heads that would become increasingly grim.

Despite the fact that the East Coast/West Coast hip-hop war had been going on since the early 1990s already, it was not until 1995 that the gangsta rapper who would eventually become the conflict’s most important player became involved: Tupac “2Pac” Shakur. 2Pac was born in East Harlem, New York City in 1971 and grew up on the East Coast – initially in New York City and later in Baltimore, Maryland – before moving to California at age 17 in 1988. There, he began pursuing a career in music, releasing his first album in 1991 and becoming increasingly successful from then onward. Although he moved to the West Coast, 2Pac stayed in regular contact with friends and family from the East Coast and collaborated with artists and producers from New York. However, his relationship with New York hip-hop changed drastically after 2Pac survived being shot five times in a Manhattan recording studio where 2Pac’s friend, the Brooklyn rapper Christopher “The Notorious B.I.G.” Wallace, was present. 2Pac believed The Notorious B.I.G. to be complicit in the shooting, causing a rift between the two. Soon after, 2Pac was incarcerated at Clinton Correctional Facility on a sexual abuse conviction, a conviction he served 11 months of before Marion “Suge” Knight posted 2Pac’s \$1.4 million bail in exchange for 2Pac signing to his label Death Row Records. As a result, 2Pac and The Notorious B.I.G.’s personal conflict became entwined with the existing conflict between their record labels (The Notorious B.I.G. was signed to Bad Boy Records), a feud that was itself rooted in the conflict between East Coast and West Coast hip-hop culture, and escalated the East Coast/West Coast war to cataclysmic levels.

Fueled by his new affiliation with Death Row Records and his rage against The Notorious B.I.G. and the New York scene in general, 2Pac became increasingly hostile towards East Coast hip-hop culture and more overtly affiliated himself with West Coast hip-hop. In the process, 2Pac, despite being from the East Coast, ironically became the West Coast’s leading figure in the bicoastal hip-hop war (Forman, 2002). 2Pac’s increased affiliation with the West Coast (from the end of 1995 onward) was apparent from his comments during interviews, his lyrics, the

production style of his songs, and the cover of his 1996 album *All eyez on me*, on which he posed making the characteristic West Coast “W” hand gesture. Nevertheless, 2Pac struggled with his regional identity and allegiance ever since moving to the West Coast, which is understandable considering hip-hop’s focus on regionality, authenticity, and the fact that representing another region than one is originally from is often frowned upon. The latter of these frustrated 2Pac, as evidenced by the following agitated remarks he made during an interview with Vibe Magazine in May 1996:

This is not a new allegiance to the West Coast. I been on the West Coast all this time. (...) It’s just that by me keeping it real, I always said where I came from. I always gave New York they props.¹¹ On *Me against the world*, I took a whole song [“Old school”] to give it up [for New York]. So now on the next album [*All eyez on me*], when I want to give it up for my home, where I’m at, everybody got a problem? Why didn’t they have no problem with [The Notorious B.I.G.] saying “Brooklyn in the house” every fucking show he do? (...) Why is it not hip-hop when I do it? (Shakur, 1996b)

Perhaps the most telling example of 2Pac’s struggle with regional identity comes from the intro to his posthumously released song “Thug style”, where he says: “I guess I ain’t East Coast enough for my niggas back in New York, and I ain’t West Coast for these niggas on the West, huh?” (1997).

Tragically, as the “extremes that artists and their followers were willing to go to in order to demonstrate East Coast and West Coast loyalties culminated in the deaths of two of [hip-hop]’s most gifted performers” (Morgan, 2001, p. 193), 2Pac became the victim of a drive-by shooting on September 7, 1996 which caused him to die six days later at the age of 25. Although neither the shooter nor the reason for the attack were ever officially identified, it is likely that 2Pac’s homicide was not a direct consequence of the regional hip-hop rivalry but of his involvement with Los Angeles gang politics instead. However, the murder of 2Pac’s adversary The Notorious B.I.G. at the age of 24 just six months later probably did have something to do with the bicoastal conflict (Cramer & Hallett, 2010; George, 1998; Hess, 2009; Morgan, 2001).

¹¹ The phrase *to give props* is slang for ‘to give credit’ or ‘to pay respect’.

1.2 Case study: 2Pac's dissent against the East Coast

The present chapter – which is concerned with the sociolinguistic dimension of dissatisfaction and dissent as expressed in intraregional and interregional hip-hop battles – investigates how 2Pac, despite having been born and raised on the East Coast, managed to become the main representative of West Coast hip-hop culture during the East Coast/West Coast hip-hop war, specifically looking at the way he used his lyrics and manipulated his accent to this end. The case study comprises two parts: 1) an analysis of the development of 2Pac's lyrics with regards to regional affiliation, and 2) a diachronic study on the development of 2Pac's speech accent from a phonological and sociolinguistic perspective that was reported by Gilbers (2015).

The motivation for selecting 2Pac in order to study regional hip-hop battles from a lyrical and sociolinguistic perspective is multifold. First of all, 2Pac was one of the two main protagonists in the greatest regional conflict in hip-hop history. Secondly, because he migrated from one dialect region to another, 2Pac is a second dialect “learner”. This makes him a viable subject for a diachronic study on the sociolinguistic factors playing a role in second dialect phonology acquisition, especially since 2Pac did not distance himself from his home region until he became involved in the East Coast/West Coast feud near the end of his life. The latter allows for a comparison between the development of his accent before and during 2Pac's involvement with the bicoastal hip-hop war, potentially revealing conscious pronunciation decisions 2Pac made to communicate his allegiance to the West Coast and express his dissent against the East Coast. Finally, from a methodological perspective, 2Pac's language development can accurately be studied diachronically because there is a vast amount of speech material available from the moment he moved from the East Coast to the West Coast (age 17, 1988) until his death (age 25, 1996). This is because even before 2Pac became internationally famous as a musician, he frequently appeared in the media as a black civil rights activist, and many of these recordings were preserved.

1.2.1 Part 1: The development of regional dissent in 2Pac's lyrics

The present section examines the lyrics of a selection of 2Pac songs relevant to his role in the East Coast/West Coast hip-hop war, analyzing how 2Pac expressed his regional affiliation and comparing his lyrics from during the conflict to those from before. It will be shown that his lyrics before and during the conflict (i.e., his lyrics

from before and after he signed to Death Row Records) are clearly different regarding 2Pac's appraisal of East Coast hip-hop culture and the degree to which he uses his lyrics to represent for the West Coast and express dissent against the East Coast.

Throughout his professional rap career, 2Pac was based in California and would occasionally represent for the West Coast in his songs, for example for the city of Oakland on his 1993 songs "Representin' 93" and "Nothing but love". Nevertheless, despite having left the East Coast in 1988 already, 2Pac would often pay homage to East Coast hip-hop culture in his music as well. An example of this is his 1995 song "Old school". In that song, which was recorded before 2Pac was shot in Manhattan, he pays homage to New York's different boroughs, dozens of New York rappers and deejays, New York hip-hop fashion, and even typical New York street culture phenomena such as the Ringolevio children's game that originated in New York City.

After getting shot and nearly killed in Manhattan, doing time in prison, and signing to Death Row Records, however, 2Pac's lyrics changed drastically when it comes to the degree to which he used them to represent for the West Coast. Moreover, the lyrics from this period reflected how 2Pac's view of East Coast hip-hop had changed. Roughly two months after he was released from prison and signed to Death Row Records, 2Pac released his first song under the banner of Death Row Records: "California love" (1995). The appropriately titled song is an ode to California and West Coast hip-hop culture, and it features Dr. Dre and Roger Troutman, two artists who played a crucial role in shaping the funky sound and style of West Coast hip-hop during the early 1990s (i.e., G-Funk; Quinn, 2005). 2Pac raps only a single verse on the track. Through these 16 bars, however, he unequivocally communicated his newfound allegiance to the West Coast, as the verse contains well over a dozen references to California and/or West Coast hip-hop. For instance, he mentions a myriad of Californian cities and iconic locations such as Los Angeles, Long Beach, the San Francisco Bay Area, Sacramento, and Rosecrans Avenue in South Los Angeles. He also alludes to California pop culture by referencing his own label Death Row Records, Dr. Dre's typical West Coast G-Funk production style, the 1965 song "California dreamin'" by Californian rock group The Mamas and the Papas, the 1985 movie *To live and die in L.A.* – which is referenced in relation to the 1992 Los Angeles riots as well as said city's street gang culture – and West Coast hip-hop fashion trends.

The song's most revealing line for an analysis of 2Pac's regional affiliation in the "California love" verse is the following: "In L.A., we wearin' Chucks – not

Ballys” (1995). Although it may seem like a relatively trivial line in which 2Pac describes West Coast hip-hop sneaker fashion, the line is particularly relevant because it reveals that 2Pac is not just paying homage to West Coast hip-hop culture but that he is also purposely disrespecting East Coast hip-hop culture. Chucks – or Chuck Taylor All-Stars sneakers – were especially popular among the West Coast hip-hop community at the time. In contrast, Bally sneakers – which were popular among the East Coast hip-hop community during the 1980s and 1990s – were considered too flashy and corny by the West Coast hip-hop community. The idea that 2Pac is really taking sides through this song is supported by the song’s outro, when 2Pac raps the following: “Let’s show these fools how we do it on this Westside, ‘cause you and I know it’s the best side.” The song thus not only serves to affiliate 2Pac with West Coast hip-hop culture, but also to distance him from the East Coast. This type of subtle criticism of East Coast culture while praising West Coast culture that was found in “California love” can be found throughout his first Death Row Records album *All eyez on me*, for instance on the song “Heartz of men” (1996), when he refers to the West Coast as the real side, implying that the East Coast is comparatively fake: “Now, me and Quik finna¹² show you niggas what it’s like on *this* side – the real side.” Considering the importance attached to the concept of “keeping it real” in hip-hop culture (Morgan, 2001), this assertion should be interpreted as a display of great disrespect towards East Coast hip-hop culture.

As the tensions between 2Pac and The Notorious B.I.G., Death Row Records and Bad Boy Records, and the West and the East Coast increased, so did the viciousness and explicitness of 2Pac’s anti-East Coast lyrics. A clear example of this are 2Pac’s lyrics on “Hit ‘em up” (1996), a song which journalist Chuck Philips described as “a caustic anti-East Coast jihad in which the rapper threatens to eliminate Biggie,¹³ [Puff Daddy] and a slew of Bad Boy artists and other New York acts” (2012). Amid countless expletives, insults, and threats, the song’s outro reveals that in 2Pac’s eyes, this is definitely no longer just a personal conflict – “now, when I came out, I told you it was just about Biggie, [but] then everybody had to open they mouth with a motherfucking opinion” – but rather a regional one – “Any of you niggas from New York that want to bring it, bring it (...) Westside ‘till we die!” (1996). What is especially salient in this respect is the “us versus them” message that 2Pac communicates throughout the song, with “us” referring to the

¹² The song’s producer DJ Quik, one of the West Coast’s most influential producers; *finna* is a slang expression meaning ‘going to’.

¹³ Another nickname that The Notorious B.I.G. went by.

West Coast hip-hop community and “them” to the East Coast hip-hop community. By doing so, he further establishes the coastal dichotomy, his allegiance to the West Coast, and, most importantly, the fact that he himself is to be considered a true member of the West Coast hip-hop community despite originally being from New York.

1.2.2 Part 2: The development of regional dissent in 2Pac’s accent

In the present chapter, it has been asserted that in hip-hop culture, language use is one of the prime means to express regional identity and affiliation, and that hip-hop community members make use of their regional AAE dialects’ phonological features to communicate their regional identity (Morgan, 2001). For East Coast and West Coast AAE, the most salient phonological feature in this respect is vowel duration, which is relatively short for East Coast AAE and relatively long for West Coast AAE (Cutler, 2007; Gilbers, 2015; Morgan, 1993, 1998, 2001).¹⁴ In light of this, this section presents the results of a study by Gilbers (2015) on how 2Pac – a native speaker of East Coast AAE – acquired West Coast AAE as a second regional dialect of AAE, a study which focused on the diachronic development of 2Pac’s vowel duration and on how this development is related to the way 2Pac communicated his dissent against the East Coast.

1.2.2.1 Hypotheses on 2Pac’s accent development in relation to anti-East Coast sentiments

Gilbers (2015) studied 2Pac’s accent development between 1988 (the year of his migration to California) and 1996 (the year he was murdered), focusing on how 2Pac’s changing sentiments towards the East and West Coast over time affected this development. It was hypothesized there were two phases of 2Pac’s accent development over time, namely the period until 1995 and the period after 1995 (the year that 2Pac started feuding with the East Coast on behalf of the West Coast), phases that are clearly distinct regarding the degree to which 2Pac’s relationship with the East Coast (in terms of dissent) influenced his accent.

¹⁴ Compared to the works cited here, Chapter 2 of this dissertation provides (more extensive) quantitative evidence for the claim that West Coast AAE vowels are longer than East Coast AAE vowels. However, since Chapter 1 was first published before the study of Chapter 2 had been conducted, I have chosen not to adapt the text to reflect more recent findings, instead printing the chapter’s text here as it was originally published (barring some minor editorial changes).

1.2.2.1.1 Phase 1 (1988-1995)

Upon migrating to California, 2Pac's accent would gradually assimilate to West Coast AAE pronunciation norms (i.e., increased vowel duration over time; Exemplar Theory) as well as display greater variation in speech production (i.e., his language system would become less stable; Complex Dynamic Systems Theory). These types of gradual, diachronic accent changes are not the result of someone's conscious language choices. Rather, they occur unconsciously and can be considered unavoidable effects of moving to another dialect region.¹⁵

1.2.2.1.2 Phase 2 (1995-1996)

In contrast, it was hypothesized that from 1995 onward, 2Pac would actively seek to manipulate his accent to sound like a Californian rather than a New Yorker, which would result in faster assimilation towards West Coast AAE accent norms than before. There is much evidence that suggests sociolinguistic factors such as feelings of identity and attitudes towards the new and the old dialect's speech communities may profoundly impact individuals' acquisition rates (e.g., Chambers, Trudgill & Schilling-Estes, 2002; Eckert, 2006; Nycz, 2013; Waninge, Dörnyei & De Bot, 2014). Considering the strong sociolinguistic relationship between language use and regional hip-hop identity, manipulating one's accent in such a way would accomplish two things in 2Pac's case. Firstly, it would add credibility to his (lyrical) anti-East Coast campaign, since sounding like someone from the East Coast when you are feuding with that region would be problematic for obvious reasons. Secondly, within the hip-hop community, a conscious decision to distance yourself from your East Coast linguistic roots could be interpreted as a subtle yet powerful expression of disrespect and dissent.

1.2.2.1.3 2Pac's projected accent development

Figure 1.1 presents a visualization of 2Pac's diachronic accent development as it was hypothesized above. It shows a stable period around East Coast AAE vowel duration norms until 1988, followed by a period of gradual assimilation to West Coast AAE's longer vowel norms as well as increased variability until 1995. This gradual assimilation reflects the hypothesis that before 2Pac became involved with the bicoastal conflict, his acquisition of a West Coast accent was a mostly unconscious process. After 1995, the rate of 2Pac's assimilation towards West Coast

¹⁵ For more information on Exemplar Theory and Complex Dynamic Systems Theory, see Gilbers (2015).

Figure 1.1. Predicted developmental trajectory (schematically represented) of 2Pac’s vowel duration (mean and range). The horizontal, dark gray line indicates a hypothetical West Coast AAE baseline; the horizontal, light gray line indicates a hypothetical East Coast AAE baseline (Gilbers, 2015).

AAE norms increases. This increase in the rate of assimilation reflects the hypothesis that when 2Pac became West Coast hip-hop’s leader in 1995, he would deliberately manipulate his accent to sound more like a Californian.

1.2.2.2 Discussion of method and results

Eight recordings of interviews with 2Pac were analyzed, all of which were conducted between 1988 and 1996 (one per year, except for 1990).¹⁶ The recordings were controlled for speech rate so that this would not influence vowel duration measurements. The recordings were analyzed for vowel duration in 2Pac’s /æ/ vowels followed by voiceless consonants (hereafter: voiceless postvocalic context) and sonorants (hereafter: sonorant postvocalic context). Per recording, 20 tokens in stressed position were analyzed per postvocalic context. Vowel duration was measured in milliseconds (ms) using Praat (version 5.3.84; Boersma & Weenink, 2014). From the collected vowel duration data, descriptive statistics were obtained. To limit outlier noise, raw measurements were also smoothed using a moving window approach (i.e., values measured for any given year were averaged with those of the years immediately before and after).

¹⁶ No interview recordings of sufficient quality could be obtained for the year 1990.

As is evident from Figure 1.2 and Figure 1.3,¹⁷ Gilbers (2015) found that until 1995, 2Pac's /æ/ vowels gradually became longer on average, and that his production in terms of vowel duration showed more variation as time progressed. These findings thus confirm the 1988-1995 hypothesis. Moreover, Gilbers (2015) reports that in the period from 1989 until 1995, on average, 2Pac's vowel duration increased by only 2.31% per year. From 1995 until 1996, however, his vowel duration grew by 18.86%, meaning that 2Pac's yearly rate of assimilation to West Coast AAE pronunciation norms was roughly nine times higher during his involvement in the East Coast/West Coast hip-hop war than it was before. This suggests that 2Pac did indeed consciously manipulate his accent to sound like he was from the West Coast and distance himself from his East Coast roots. Gilbers's reports of overshooting instances (i.e., instances where 2Pac's vowels were even longer than native speakers of West Coast AAE would pronounce them) in only the 1996 recording reinforce the idea that this increase in 2Pac's rate of assimilation towards West Coast AAE accent norms originates from a conscious effort to sound like someone from the West Coast. In other words, the vowel duration measurements reveal that 2Pac deliberately manipulated his pronunciation in order to use his accent as a means of expressing dissent against East Coast hip-hop.

1.3 The bicoastal hip-hop war's effect on 2Pac's lyrical and linguistic development

Although there had been tensions between East and West Coast hip-hop for years already, 2Pac did not become involved with the East Coast/West Coast hip-hop war until he signed with Death Row Records in late 1995. In his lyrics from before this period, 2Pac represented for the West Coast but also paid homage to East Coast hip-hop culture. After signing to Death Row Records, however, he seemed to increase how much he represented for the West Coast. Moreover, he no longer spoke positively of East Coast hip-hop culture, but instead disrespected it. This display of pro-West Coast and anti-East Coast sentiments in his lyrics was relatively subtle and playful at first, but turned more explicit, aggressive and violent as tensions between East Coast and West Coast artists were rising.

¹⁷ This chapter's graphs from Figure 1.2 onward include 1990 on the horizontal axis even though no data were collected for this year, because if 1990 were omitted from the timeline, it might seem as if the development from 1989 until 1991 took place within one year. For the unsmoothed measurements, the plotted 1990 data points are consistently the same as the 1989 ones.

Figure 1.2. Mean and range for 2Pac's /æ/ vowel duration in ms (voiceless postvocalic context; Gilbers, 2015).

Figure 1.3. Mean and range for 2Pac's /æ/ vowel duration in ms (sonorant postvocalic context; Gilbers, 2015).

In parallel, 2Pac's accent gradually moved towards West Coast AAE norms until 1995, with his language development trajectory showing no signs of 2Pac purposely attempting to acquire the West Coast AAE accent during this period. Instead, his cognitive language system changed in a way that is typical for people who move to another dialect region when there are no significant sociolinguistic

factors affecting their motivation to acquire the new dialect region's accent. During the period when he was involved in the bicoastal hip-hop war, however, 2Pac's rate of assimilation towards West Coast AAE accent norms increased by a factor of 9 compared to his average yearly rate of assimilation before 1995. Moreover, Gilbers (2015) found evidence of 2Pac overshooting West Coast AAE targets for vowel duration, which suggests that he was purposely trying to sound like someone from the West Coast and let go of his East Coast language roots. Crucially, the sudden, post-1995 spike in 2Pac's rate of assimilation towards the West Coast accent as well as the observed overshooting effect in 2Pac's 1996 recording cannot be accounted for by purely linguistic theories; a sociolinguistic perspective is needed to explain these observations. In other words, there is no theoretical foundation to conclude that 2Pac did not consciously manipulate his accent during this period, and considering the circumstances in which he found himself during the bicoastal feud, the most likely reason for 2Pac's pronunciation behavior was a desire to express his dissatisfaction with the East Coast.

Considering that during this period, there were indeed societal circumstances causing 2Pac's East Coast roots to be problematic – one can imagine that lyrically disrespecting New York hip-hop culture while still sounding like a New Yorker might sound inauthentic – the diachronic accent analysis data reveal that 2Pac deliberately manipulated his accent to sound more like a native speaker of West Coast AAE from 1995 onward. Manipulating his accent this way lent his claims that he was the true embodiment of West Coast hip-hop culture the authenticity and credibility required for 2Pac to be accepted as such by the West Coast hip-hop community. Furthermore, his decision to abandon his East Coast AAE accent as much as possible also served as yet another means of attacking the East Coast and expressing his resentment of the whole New York hip-hop scene, for it meant that in every single one of 2Pac's utterances during the bicoastal feud – no matter their semantic content – there was a subtle expression of dissatisfaction with and dissent against East Coast hip-hop culture.

1.4 Conclusion

In conclusion, two of hip-hop culture's most notable characteristics are its competitive nature and its emphasis on region and place. Because of these characteristics, regional status has been the source of numerous feuds between rappers, and the way in which rappers express their dissatisfaction during these battles is often particularly ruthless. Considering that regional AAE accents are among the primary tools to communicate regional affiliation (Morgan, 2001), the

present chapter aimed to investigate how sociolinguistic factors might play a role in regional hip-hop conflicts. 2Pac's deliberate manipulation of his accent to compensate for the fact that he was not actually from the region he represented and to constantly defy his East Coast roots suggests that sociolinguistic factors indeed play an important role in regional hip-hop conflicts: 2Pac expressed his dissatisfaction with East Coast hip-hop not just through the words he said, but also through the way he pronounced them. The results thus suggest that regional accents are important tools for rappers to ensure that the regional affiliations they express in their lyrics are taken seriously by the hip-hop community.

**African-American English
regiolects and hip-hop:
Comparing East Coast and West
Coast vowel duration**

2.1 Introduction

The present article is concerned with regional variation in African-American English (AAE) – specifically regarding its East Coast and West Coast regiolects – in the context of hip-hop culture. It examines AAE regiolects in a hip-hop context because the concepts of regional affiliation and identity are central to hip-hop culture, and because hip-hop aficionados – or “heads” (Alim, 2015) – purposely use their own regional accents of AAE to express their regional hip-hop identity (Forman, 2002; Gilbers, 2015, 2018a; Gilbers et al., 2019a; Hess, 2009; Morgan, 1993, 1998, 2001, 2002). In light of this, and considering the longstanding rivalry between the East Coast and West Coast hip-hop communities, one can expect that speakers of these dialects immersed in hip-hop culture are more likely to use markedly regional accents than those who are not, making them optimal candidates to assess regional accent differences. Therefore, this study analyzes free speech recordings of 20 prominent African-American rappers from either the East Coast or the West Coast. The goal of the study was to test the claim that West Coast AAE vowels are longer than East Coast AAE vowels, a regional difference which has been anecdotally reported (e.g., Morgan, 1993, 1998, 2001; Cutler, 2007, 2014) but has not been supported by sufficient quantitative, acoustics-based evidence yet.

2.1.1 AAE regiolects and hip-hop

Few varieties of English have been studied as much as AAE, the social dialect of English spoken by African-Americans (Schneider, 1996; Thomas & Carter, 2006). AAE became the centerpiece in the sociolinguistic fight against popular beliefs of language diversity that has been waged from the 1960s onward, when sociolinguists such as Baratz (1968), Labov (1969), and Wolfram (1970) disputed the dominant, racist notion of AAE as being a variety of American English inferior to the standard, white variety, and disproved it on linguistic grounds. However, in their zealous attempts to eradicate the tenacious myths of linguistic folklore surrounding AAE, sociolinguists have themselves constructed different myths about AAE (Wolfram, 2007; Wolfram & Kohn, 2015).

Arguably the most pervasive myth about AAE is what Wolfram (2007) called the “supraregional myth” and what Wolfram and Kohn (2015) called the “homogeneity myth”: the idea that AAE is a regionally homogeneous language variety. This myth of regional homogeneity already stems from the first descriptive studies of AAE (e.g., Fasold, 1972; Labov, Cohen, Robins & Lewis, 1968; Labov, 1972; Legum, Pfaff, Tinnie & Nicholas, 1971; Wolfram, 1969), which concluded that the structural features of AAE were shared across AAE-speaking communities

regardless of regional context. Regional differences that in retrospect were already apparent from the earliest studies on AAE were dismissed as incidental or irrelevant (Wolfram, 2007; Wolfram & Kohn, 2015). More recently, however, it was found that there are in fact regional differences between varieties of AAE spoken in the United States (e.g., Blake & Shousterman, 2010, Carpenter, 2004, 2005; Childs & Mallinson, 2004; Childs, 2005; Cutler, 2007, 2014; D’Andrea, 2005; Gilbers, 2015, 2018a; Gilbers et al., 2019a; Green, 2002; Hinton & Pollock, 2000; Jones, 2015, 2020; Mallinson & Wolfram, 2002; Mallinson, 2006; Morgan, 2001; Pollock & Berni, 1997; Rowe 2005; Wolfram & Thomas, 2002; Wolfram, 2003).

A description of regional varieties of AAE should include a discussion of the relevance of the differences between these to their speakers. In this respect, the cultural movement of hip-hop plays an important role due to its intricate relationship with AAE, the language variety primarily associated with hip-hop (e.g., Alim, 2004, 2015; Cutler, 2007, 2014; Morgan, 2001; Smitherman, 1997). Region and place are central to hip-hop culture and the identity of its members, and because of its competitive nature, hip-hop facilitates a great sense of local pride (Forman, 2002; Hess, 2009; Morgan, 2001). Representing particular regions or cities invokes a social experience shared with other hip-hop community members from those respective places, linking one to the traditions of that region. As the birthplace of hip-hop culture, New York City dominated what hip-hop culture sounded and looked like for over a decade since its inception, but as hip-hop culture was exported across the United States in the mid-1980s, New York’s hip-hop hegemony began to wither. In California, a raw version of hip-hop distinct from New York’s arose: West Coast gangsta rap. Influenced by the extreme territorialism of Los Angeles street gang culture, a desire emerged among the members of the new West Coast hip-hop community to assert themselves as distinct from the New York hip-hop community (Forman, 2002; Hess, 2009). As Morgan (2001) puts it, “[f]or the first time, the [hip-hop] community had to consciously address whether the emergence of different regional styles constituted a split in the [hip-hop] nation” (p. 193). Such a split did indeed occur in the 1990s, when tensions between the West Coast and the East Coast increased significantly, culminating in the deaths of Tupac “2Pac” Shakur and Christopher “Biggie Smalls” Wallace, who represented for the West Coast and East Coast respectively.

According to hip-hop linguists like Alim (2004, 2015) and Morgan (2001), language plays a central role in hip-hop culture, meaning it is “not simply a means of communication (...) but is viewed as a series of choices that represent beliefs and have consequences” (Morgan, 2001, p. 190). Because of this, a “drive to distinguish

and articulate linguistic characteristics to represent major cities and regions on the East and West Coasts” (Morgan, 2001, p. 188) emerged when hip-hop was exported across the country and new hip-hop speech communities were formed. Members of the hip-hop community are in fact highly aware of phonological differences between regional dialects of AAE, and they make active use of their regional accent features to distinguish regional differences, for instance East Coast AAE from West Coast AAE (Gilbers et al., 2019a; Morgan, 2001, 2002).

As the East Coast and West Coast accents of AAE have not been directly compared to each other very often, little is currently known about how the East Coast and West Coast AAE accents differ from each other. What we do know is that compared to East Coast AAE, West Coast AAE prosody is characterized by significantly more rhythmic variation and higher degrees of pitch fluctuation (Gilbers et al., 2019a). Moreover, Morgan (1993, 1998, 2001, 2002) reports that in West Coast AAE, intervocalic /t/ is flapped, whereas in East Coast AAE it is glottalized. Arguably the most widely reported phonetic difference between the two dialects is that West Coast AAE’s vowels are longer than East Coast AAE’s (Morgan, 1993, 1998, 2001, 2002; Cutler, 2007, 2014), but this observation was based on anecdotal rather than quantitative evidence. For /æ/ vowels, Gilbers (2015) did verify the observation that West Coast AAE vowels are longer than East Coast AAE vowels, but their data set only comprised vowels from four speakers (two per coast), leaving much to desire with regards to sample representativeness. Additionally, Gilbers (2015, 2018a) reports that as a result of increased exposure to West Coast AAE, the rapper Tupac “2Pac” Shakur’s /æ/ vowels became longer when he moved from the East Coast to the West Coast, suggesting that West Coast AAE vowels are indeed longer than East Coast vowels.

2.1.2 Hypothesis

The hypothesis for this study, which was based on earlier reports by Morgan (1993, 1998, 2001, 2002), Cutler (2007, 2014), and Gilbers (2015, 2018a), is as follows: West Coast AAE /æ/ vowels are significantly longer than East Coast AAE /æ/ vowels, both when followed by a voiceless consonant and when followed by a sonorant consonant.

2.2 Method

The present study’s methodology, which largely follows the methodology of Gilbers’s (2015, 2018a) work on the length of 2Pac’s /æ/ vowels, is presented below.

Table 2.1. Selected West Coast and East Coast hip-hop artists.

West Coast	East Coast
Daz Dillinger, DJ Yella, Dr. Dre, Ice Cube, Kendrick Lamar, MC Eiht, Snoop Dogg, The Game, Warren G, YG	50 Cent, Biggie Smalls (The Notorious B.I.G.), Grandmaster Caz, Jay-Z, Lloyd Banks, Nas, Q-Tip, Raekwon, Rakim, Rev Run

2.2.1 Procedure

2.2.1.1 East Coast/West Coast AAE audio corpus

An East Coast/West Coast AAE audio corpus was created for the present study. It comprises interview recordings featuring naturalistic speech from 20 prominent hip-hop artists (10 artists per coast). The interviews that were included were originally produced for podcasts, radio shows, television programs, or online streaming platforms (see Appendix Table 2.1 for an overview). To limit variability, all speakers that were selected for analysis were African-American males from either the Tri-State Area or the Greater Los Angeles Area, the two major hubs of East Coast and West Coast hip-hop culture respectively. An overview of the artists who were included in the corpus can be found in Table 2.1.

The speakers were selected on the basis of three criteria. Firstly, all of them are native speakers of East Coast AAE or West Coast AAE. Secondly, all are influential hip-hop artists in terms of critical acclaim and/or commercial reception, and, as such, all can be considered deeply embedded in hip-hop culture. Whether an artist was influential/prominent enough to be included in our study was determined on the basis of *Ranker.com*'s "The best rappers from Los Angeles" and "The best New York rappers" lists: we only selected hip-hop artists that were featured on either of these two lists. Thirdly, none of them ever represented for another city/region than where they were born.

Per speaker, one recording was obtained, amounting to a total of 20 recordings (10 per dialect). Since already existing interviews were used – which were of course conducted for other purposes than the present study – factors such as interlocutor effects and setting effects were not controlled for. Each recording was controlled for speech rate by randomly selecting three five-second samples of uninterrupted speech, assessing the number of syllables per second and averaging the three samples' amount of syllables. To allow for fair comparison between the recordings regarding vowel duration, recordings were only included in the corpus if their average speech rate was assessed to be 5 syllables per second. A 4.5 percent deviation from this 5 syllables per second norm was allowed following the norms for just noticeable differences in speech rate perception (Eefting & Rietveld, 1989),

so that average speech rates were allowed to be in the range of 4.775-5.225 syllables per second. The recordings were obtained from the internet (in MP3 format), and, using Adobe Audition (Adobe Inc., version 3.0), the recordings were converted from stereo to mono (22.05 kHz sample rate), subjected to a restorative process (noise reduction) to enhance their audio quality (if necessary), and normalized for amplitude.¹⁸

2.2.1.2 Phonetic analysis

The corpus's recordings were analyzed for /æ/ vowel duration. Since the duration of vowels is affected by their postvocalic contexts (e.g., Hayes, 2009), vowels followed by voiceless consonants (hereafter: voiceless postvocalic context) (e.g., 'rap') and vowels followed by sonorant consonants (hereafter: sonorant postvocalic context) (e.g., 'man') were analyzed separately. 40 tokens were manually collected per speaker (20 per postvocalic context), resulting in a total of 800 tokens (400 per coast). Tokens of /æ/ vowels were only collected for analysis when in stressed/focused position. Acoustic measurements were conducted using Praat (version 5.3.84; Boersma & Weenink, 2014). Vowel duration was measured in milliseconds (ms), and the starting and end points of each vowel were determined on the basis of auditory cues as well as visual cues regarding vocal cord vibration and formants.

2.2.1.3 Statistical analysis

The statistical tests that were performed were the independent samples *t*-test for the voiceless postvocalic context and the Mann-Whitney *U* test for the sonorant postvocalic context. A level of $p < .05$ (two-tailed) was considered significant.

2.3 Results

Table 2.2 displays all subjects' mean /æ/ vowel duration values for both the voiceless postvocalic context and the sonorant postvocalic context. Figure 2.1 shows the mean /æ/ vowel duration for West Coast AAE and East Coast AAE in ms for the voiceless postvocalic context. On average, West Coast AAE /æ/ vowels in this postvocalic context were found to be longer than East Coast AAE /æ/ vowels, as the mean values were 173.24 ms ($SD = 11.90$) and 152.36 ms ($SD = 12.40$) respectively. This difference was found to be significant with a large effect size,

¹⁸ None of these audio enhancements could have influenced the variables measured for this study as the recordings' temporal dimension was not affected.

Table 2.2. Mean duration of /æ/ vowels (ms) for all subjects and both postvocalic contexts.

West Coast			East Coast		
	Voiceless	Sonorant		Voiceless	Sonorant
Daz Dillinger	187.95	214.90	50 Cent	140.45	152.90
DJ Yella	171.40	182.80	Biggie Smalls	141.75	155.00
Dr. Dre	166.85	185.95	Grandmaster Caz	151.55	157.95
Ice Cube	180.35	192.00	Jay-Z	134.35	153.50
Kendrick Lamar	150.55	182.10	Lloyd Banks	173.25	160.50
MC Eiht	184.40	195.05	Nas	151.55	157.95
Snoop Dogg	158.50	175.65	Q-Tip	159.65	178.35
The Game	171.85	180.10	Raekwon	166.95	164.70
Warren G	181.95	221.85	Rakim	160.10	178.55
YG	187.95	214.90	Rev Run	147.15	157.55

Figure 2.1. Mean duration of /æ/ vowels (ms) for West Coast AAE (gray) and East Coast AAE (white) for the voiceless postvocalic context – error bars show standard errors.

$t(18) = 3.841, p = .001, d = 1.718$. Figure 2.2 shows the mean /æ/ vowel duration for West Coast AAE and East Coast AAE in ms for the sonorant postvocalic context. On average, West Coast AAE /æ/ vowels in this context were found to be longer than East Coast AAE /æ/ vowels as well; the mean values for West Coast AAE and East Coast AAE were 195.39 ms ($SD = 18.22$) and 161.97 ms ($SD = 9.39$)

Figure 2.2. Mean duration of /æ/ vowels (ms) for West Coast AAE (gray) and East Coast AAE (white) for the sonorant postvocalic context – error bars show standard errors.

respectively. This was a significant difference with a large effect size, $U = 2.000$, $p < .001$, $r = 0.803$.

2.4 Discussion

The results of this study support the hypothesis that West Coast AAE /æ/ vowels are longer than East Coast AAE /æ/ vowels, both when preceding voiceless consonants and when preceding sonorants. Hence, they substantiate earlier reports of West Coast AAE vowels being longer than East Coast AAE vowels that were based on mostly anecdotal evidence (e.g., Morgan, 1993, 1998, 2001, 2002; Cutler, 2007, 2014), reports based on quantitative evidence using too small a sample to make any strong claims (Gilbers, 2015), and reports based on circumstantial evidence from a second dialect acquisition study of 2Pac's /æ/ vowels (Gilbers, 2015, 2018a).

Building on the findings of the current study, there are several lines of inquiry that would be valuable to pursue. For instance, considering that only /æ/ vowel duration was measured for this study, it would be interesting for a future study to analyze AAE vowel duration for other vowels as well, perhaps also comparing the differences between tense and lax vowels in this regard. Doing so would provide us

with a more comprehensive idea of how East and West Coast AAE differ from each other in terms of vowel duration. Furthermore, the present study did not include a voiced obstruent postvocalic context – i.e., when the vowels precede voiced obstruents – for pragmatic reasons (not enough tokens could be obtained for all speakers in the corpus as this postvocalic context is rarer than the other ones for /æ/ vowels), but a future study could perhaps also look at such a postvocalic context to improve comprehensiveness.

In terms of the type of speakers analyzed, a suggestion for future research would be to replicate the present study with speakers of AAE that are not involved with hip-hop culture at all. This way, the version of AAE spoken in hip-hop culture – the variety which Alim (2004, 2015) and Cutler (2007, 2014), for instance, refer to as “Hip-Hop Nation Language” (HHNL) – could be teased apart from the non-hip-hop version of AAE. Continuing on this line of thought, while the present study purposely excluded female speakers in order to make sure there would be as little within-group variation as possible, it would be valuable to also analyze female speakers in a future study. Limiting within-group variation was also the motivation for only looking at speakers from the Greater Los Angeles Area and the Tri-State Area, excluding speakers from other parts of the West Coast and East Coast dialect and hip-hop regions. Therefore, it would be valuable to analyze speakers from the rest of these regions (e.g., the California Bay Area, Boston, Philadelphia, etc.) in a follow-up study as well. Finally, a study investigating AAE vowel duration in other regions than the East and West Coast would be an important contribution to the work on AAE’s regional variation across the entirety of the United States.

2.5 Appendix

Appendix Table 2.1. Information regarding the interviews selected for vowel duration analysis.

Subject	Interview description	Source	Year
Daz Dillinger	Vlad TV	youtu.be/Tc_sjmgRgVA	2015
DJ Yella	Vlad TV	youtu.be/LdO7SJ5VGoQ	2015
Dr. Dre	Rhyme & Reason documentary	youtu.be/DOsLMpphQ_M	1997
Ice Cube	Onrust (Dutch TV)	youtu.be/KqFcLBhYipM	1991
Kendrick Lamar	GQ	youtu.be/4IPD5PtqMiE	2016
MC Eiht	Vlad TV	youtu.be/l-cMd50Ha0E	2016
Snoop Dogg	The Arsenio Hall Show	youtu.be/O24JLNincTM	1994
The Game	Big Boy's Neighborhood	youtu.be/6QqyrHZlbWc	2016
Warren G	Ebro in the Morning	youtu.be/0blMD48aR0s	2015
YG	Shay Diddy TV	youtu.be/ISOJMaX2xK4	2016
50 Cent	MTV News	youtu.be/3eSpL-qqfok	2005
Biggie Smalls	Original source unknown	youtu.be/Lv8PdI477ks	1995
Grandmaster Caz	Vlad TV	youtu.be/jf4BgLZkE_A	2015
Jay-Z	The Fresh Air	npr.org/2017/06/16/533216823/ja-y-z-the-fresh-air-interview	2010
Lloyd Banks	4Front Magazine	youtu.be/lzwhijMc9WVM	2011
Nas	BET Presents	youtu.be/2bCf-60IHMo	2003
Q-Tip	Red Bull Music Academy	youtu.be/8RWctL6Pk6A	2013
Raekwon	Sway in the Morning	youtu.be/cxMOXK2vdI4	2015
Rakim	The Cipher Show	theciphershow.com/episode/65/	2014
Rev Run	DJ Enuff	youtu.be/WO_-DfPQPcY	2014

***Regional Variation in West and East Coast African-American English Prosody and Rap Flows**

* Slightly adapted from previously published research article in *Language and Speech* (Gilbers et al., 2019a/2020).

Online

Gilbers, S., Hoeksema, N., de Bot, K., & Lowie, W. (2019a). Regional variation in West and East Coast African-American English prosody and rap flows. *Language and Speech*, 1-33.

Print

Gilbers, S., Hoeksema, N., de Bot, K., & Lowie, W. (2020). Regional variation in West and East Coast African-American English prosody and rap flows. *Language and Speech*, 63(4), 713-745.

3.1 Introduction

Though regional variation in African-American English (AAE) remains a highly understudied subject – especially considering that AAE is among the most frequently investigated varieties of English in sociolinguistic history (Schneider, 1996; Thomas & Carter, 2006) – several studies have found that AAE exhibits significant regional variation (Wolfram, 2007; Wolfram & Kohn, 2015). It has also been shown that regional variation in AAE is salient to its speakers, especially those involved with hip-hop culture, in which great importance is assigned to region and place (Forman, 2002; Hess, 2009; Morgan, 1993, 1998, 2001, 2002). In fact, speakers of AAE are aware of their regional accent features, and hip-hop aficionados make active use of them to express their regional identity and affiliations (Gilbers, 2018a; Morgan, 2001, 2002). In hip-hop music, regional variation can also be observed with different regions’ rap performances being characterized by distinct styles or “flows”: the rhythmic and melodic aspects of a rap performance. As with regional accent features, rappers consciously use these regional flows to represent for their cities or larger regions (Alim, 2004; Forman, 2000, 2002), but how exactly these regional flows differ from each other has not been studied yet. From a linguistic perspective, what is striking about the concept of flow is how similar it is to the concept of prosody: the rhythmic and melodic (i.e., intonational) aspects of spoken language.

The present study, which operates on the intersection of variationist sociophonetics, musicology, and hip-hop studies, is concerned with regional variation in AAE speech prosody and rap flows, specifically regarding the United States’ East and West Coasts. It is also concerned with how this relates to research on the connection between language and music. The study’s main aims are to investigate whether East Coast and West Coast AAE differ regarding prosodic rhythm and melody, whether East Coast and West Coast rap flows are rhythmically and melodically distinct, and whether regional variation in speech and rap are related to each other in that they follow the same patterns, ideas which have not been (quantitatively) examined thus far. In addition, the article proposes a new methodology for studying melodic and rhythmic variation in speech and rap.

In the subsections below, an in-depth discussion of AAE prosody, rap flows, and the possible language–music connection in a hip-hop context will be presented to provide context for the study’s aims and hypotheses. Throughout these discussions, particular attention will be paid to regional variation, especially with regards to the East and West Coasts.

3.1.1 AAE prosody

Prosody is a greatly understudied aspect of AAE (Thomas, 2015; Thomas & Carter, 2006). The main study on AAE prosodic rhythm was conducted by Thomas and Carter (2006), who examined the speech rhythms of African-Americans from North Carolina along the stress-timed/syllable-timed continuum. On this continuum, language varieties whose stressed and unstressed syllables are of substantially different lengths (e.g., Dutch) are considered to be on the stress-timed end of the spectrum, whereas language varieties whose stressed and unstressed syllables are of similar length (e.g., French) are considered to be on the syllable-timed end of the spectrum. Thomas and Carter found that the speech of African-American North Carolinians, like that of European-American North Carolinians, was highly stress-timed in nature (i.e., their stressed syllables were much longer than their unstressed ones). They also compared these recordings with recordings of African-Americans born in the mid-19th century and found that the latter were much more syllable-timed (i.e., stressed and unstressed syllables' durations were relatively similar), suggesting that AAE's syllables had grown to become less isochronous over time. However, considering that only North Carolinian speakers were analyzed, the Thomas and Carter (2006) study presumably does not constitute a very representative sample of AAE speakers. Regarding prosodic melody, AAE speakers' pitch range has been found to be greater than that of European-American English speakers in free speech (e.g., Hudson & Holbrook, 1981, 1982; Jun & Foreman, 1996; Loman, 1975; Tarone, 1973) but smaller in read speech (e.g., Cole, Thomas, Britt, & Coggs, 2005; Goodwin, Goodwin, & Yaeger-Dror, 2002; Thomas, 1999), and it has also been shown that AAE intonation patterns within and at the end of utterances are distinct from those of other varieties of English, which provides listeners with auditory cues to distinguish African-Americans from European-Americans (e.g., Foreman, 2000; Holliday, 2016; Thomas, Lass, & Carpenter, 2010).

3.1.1.1 Regional variation in AAE prosody

Though AAE prosody has been studied in a wide variety of locales – for example, rural communities in Texas (Thomas, 1999), North Carolina (Cole et al., 2005; Wolfram & Thomas, 2002), South Carolina (Goodwin et al., 2002), and Louisiana (Green, 2002) as well as urban communities in Washington, DC (Loman, 1975), Raleigh (McLarty, 2011), Seattle (Tarone, 1973), Los Angeles (Foreman, 2000; Jun & Foreman, 1996), and Pittsburgh (Gooden, 2009) – regional variation has rarely, if ever, been the focal point of AAE prosody research. Moreover, because of

diverging methodologies, comparing the findings of the aforementioned studies is difficult (Thomas, 2015), and major dialect regions have hardly been examined at all. As a result, while it is likely that “the intonational features that are diagnostically African-American are subject to (...) regional variation” (Thomas, 2015, p. 420), we have no clear idea of how regional variation surfaces in AAE prosody.

3.1.2 Flow

“Flow” is to rap what prosody is to language; both are concerned with the rhythmic and melodic aspects of their respective domains. The concept of flow has many definitions (e.g., Adams, 2009, 2015; Connor, 2018; Edwards, 2013; Krims, 2000), but most rap scholars today agree that “flow” refers to the rhythmic and melodic aspects of a rap performance. As such, analyzing rap flows is essentially no different from analyzing any other type of musical expression that revolves around rhythm and pitch. However, compared to other, more traditional forms of music, rhythm and (especially) melody are treated somewhat differently in rap music. In addition, rhythm and melody are described using different terminologies in scholarly work on rap music compared to the literature on more traditional forms of music. For this reason, the present subsection is dedicated to outlining the main rhythmic and melodic aspects of flow. This is followed by a discussion of what is currently known regarding the differences between East Coast and West Coast rap flows.

3.1.2.1 Flow’s rhythmic dimension

In terms of rhythm, many variables come into play when it comes to flow. For instance, although nearly all of rap music is performed in a 4/4-time signature, the number of syllables, the length of these notes (e.g., eighth notes, sixteenth notes, triplet notes, etc.), and the number of musical rests in a bar can vary greatly between flows. Moreover, flows are largely defined by musical microtiming: it makes a significant difference in terms of flow whether rappers perform syllables right on the beat or instead slightly before or after. Arguably the most important difference in terms of rhythm between rapping and singing, however, is that rap vocals primarily serve a percussive function. In other words, rap is, generally speaking, more concerned with the temporal location of where notes land than it is with the duration of said notes (Edwards, 2013). As such, it is often more insightful to analyze rap vocals as percussion (like one would analyze drum patterns) than it is to analyze rap vocals in terms of, for instance, note duration (as is common in musicological work on most Western (vocal) music). As Edwards writes:

A lot of the rhythmic techniques in rapping are closer to percussion and drumming than they are to traditional poetic techniques; (...) rhythmically [rapping]'s very similar to percussion. (...) Therefore, most of the terms [used to describe rapping] come from percussion and drumming rather than poetry analysis. (2013, p. 3)

Finally, while this is outside of the scope of the current study, it is worth noting that rhythmic accents and the metrical characteristics of a rap performance can distinguish one flow from another as well. In this regard, rhyme schemes play an important part, as rhymed units add an extra level of rhythmic depth: recurring sequences of rhymes add rhythmic accents that distinguish the flow of bars that are otherwise identical in terms of musical notation.

3.1.2.2 Flow's melodic dimension

Despite the fact that rap is usually distinguished from singing based on its lack of melody and its greater focus on rhythm (which is why it is considered more closely related to speech than singing is), pitch contours play a central role in flow (e.g., Adams, 2015; Connor, 2018). Most rap performances are not melodic in the traditional sense, meaning that rappers generally neither “hit” notes nor match their voice's pitch to the song's key. In fact, when people noticed how the rapper Rakim would rap in the same key as the music, they let him know this was highly unusual, as Rakim himself explained on The Cipher Show (Setaro, Kross, & Griffin, 2014):

I noticed that, like, whenever I wrote rhymes, I kind of wrote them in the key, (...) At first, I ain't really know I was doing it. Then somebody, you know, brought it to my attention, like, “yo, man, you hear how every time the key of the track change, [so do] you?” And I'm like, “ain't I supposed to do that?” (...) And then, you know, the more I started paying attention, really too many people don't really do that.

While Rakim forms an exception to the rule, all rappers manipulate pitch in some shape or form on the speech–singing continuum, and the idea that rap is marked by monotony, which can often be found in criticisms of rap music (e.g., Kelley, 2011), is unequivocally false. To illustrate, consider the late rapper Guru of the group Gang Starr, who was endearingly called “The King of Monotone” by his fans because, compared to his peers, he displayed relatively little pitch inflection. While his nickname was technically inaccurate – Guru's rapping was most definitely not

purely monotone in an absolute, robot-like sense – the fact that he was even given this moniker implies that a flow marked by relative monotony is something highly unusual in rap. Scholars such as Adams (2015) and Connor (2018) have compared rap’s use of melody to the way artists such as Bob Dylan employ the technique of *Sprechstimme*, a vocal technique which does not emphasize any notes in particular in its pitch contours.

As in speech, raising or lowering one’s pitch at specific moments during a rap performance can serve many discursive purposes, such as emphasizing a punchline, building up tension, or asserting authority or dominance (Edwards, 2013). Relatively little pitch fluctuation throughout a verse often indicates a gritty, serious ambiance, whereas higher levels of pitch fluctuation tend to indicate levity or a more relaxed vibe. It should be mentioned here, however, that there is most definitely no one-to-one relationship between how much pitch fluctuation a rapper displays and the light-heartedness of the topics they address. For example, while Snoop Dogg is renowned for frequently changing his pitch when he raps (Edwards, 2013, p. 96), he often does so while telling some of hip-hop’s darkest stories of gang violence and police brutality, as can be observed from the following lines of the song “Murder was the case” (Broadus, Young, & Arnaud, 1993), which exhibit several dramatic changes in pitch:

Pumping on my chest and I’m screaming
I stop breathing, damn, I see demons
Dear God, I wonder can you save me?
I can’t die, my boo boo’s ‘bout to have my baby (00:57–1:07)

3.1.2.3 Regional variation in rap flows – East Coast vs. West Coast

Very little research (be it qualitative or quantitative) has been conducted on how exactly East Coast and West Coast rap flows differ from each other. However, while Edwards does not offer a direct comparison of the two, his discussion of various rhythmic and melodic flow techniques provides some valuable insights in this respect. Regarding rhythm, he highlights the typically West Coast “lazy tails” syncopation technique, in which “the rapping is squarely in time to the beat, apart from certain syllables or words that are said so that they slide off the beat. This adds variation to the flow and gives it a laid-back feel” (Edwards, 2013, p. 34). Key in this quotation is that lazy tails, which usually involve elongation of a syllable’s onset so that its nucleus is pronounced slightly after the beat rather than right on it, are

used to add rhythmic variation. Their pervasiveness in the oeuvres of West Coast rappers such as Snoop Dogg, Ice Cube, Shock G, MC Eiht, and Nipsey Hussle indicates a strong tendency towards loose rather than strict rhythms, especially considering their near absence in the works of East Coast rappers.

In terms of melody, Edwards (2013) reports on several rappers whose flows are marked by a relatively monotone delivery, highlighting the works of five rappers in particular: Nas, Guru (of Gang Starr), Divine Styler, Large Professor (of Main Source), and Rakim. Though Edwards does not ascribe monotone rapping to any region in particular, the five rappers he uses to illustrate the phenomenon are all New York-based.¹⁹ In contrast, when he discusses rappers and rap groups whose flows are known for their pitch inflections, Edwards points towards Snoop Dogg several times as well as to RBX, the South Central Cartel, The Pharcyde, E-40, The D.O.C., and Pharoahe Monch. Excluding Pharoahe Monch, who is from Queens, New York, all these artists are based on the West Coast.²⁰ These examples suggest that the typical East Coast rap flow is marked by relative monotony compared to the typical West Coast flow.

3.1.3 Hip-hop's language-music connection

As of yet, it is unclear why different American regions' rap flows have developed in different ways. One possible explanation, which was suggested by Kautny (2015), is that certain languages might be better suited for certain styles of flow due to their intonational characteristics. Kautny suggested that Spanish, because it is relatively isochronous (i.e., syllable-timed), would probably lend itself better to "steady styles with crossing pulses" (Kautny, 2015, p. 114), whereas a less isochronous language such as English would lend itself better to flows with a looser rhythm. However, this hypothesis has not been tested yet in the context of different languages, let alone in the context of different regional varieties of one language's sociolect. It has not been investigated either whether Kautny's hypothesis would extend to the domain of pitch/melody as well. Coming from a linguistic perspective, Thomas has suggested that "it could be fruitful to explore the links between [AAE

¹⁹ Nas and Large Professor hail from Queens, Rakim hails from Long Island, and Divine Styler from Brooklyn. Guru was born in Massachusetts, but his group Gang Starr was based in New York City.

²⁰ Snoop Dogg and RBX are from Long Beach, California, the South Central Cartel and The Pharcyde are from Los Angeles, E-40 is from the California Bay Area, and while The D.O.C. is originally from Dallas, Texas, he made a name for himself on the West Coast gangsta rap scene, as a solo act and through collaborations with N.W.A and Dr. Dre.

prosodic] features and various styles of music, poetry, and public speaking that African-Americans have bestowed upon American culture” (Thomas, 2015, p. 432).

While the connection between regional variation in speech prosody and music has not been studied in the context of rap flows yet, the claim that composers’ music reflects their native language’s prosodic patterns (e.g., Abraham, 1974; Hall, 1953) has been investigated in other contexts. Patel, Iversen and Rosenberg (2006), for instance, analyzed prosodic rhythm and melody for British English and French and then compared their rhythmic and melodic characteristics to those of British and French classical music. Their findings indicated that British English speech was more rhythmically variable than French speech and that it was also marked by greater levels of melodic interval variability. Correspondingly, British classical music was found to be more rhythmically diverse and to exhibit more melodic variation than French classical music. From these findings, Patel et al. concluded that the rhythms and melodies of music are informed by those of speech, suggesting that “statistical learning of the prosodic patterns of speech creates implicit knowledge of rhythmic and melodic patterns in language, which can in turn influence the creation of rhythmic and tonal patterns in music” (2006, p. 3043). As such, language and music (especially regarding rhythm and pitch) are thought to be different yet closely related domains that operate in fundamentally similar ways. Comparable findings on the link between regional speech varieties and instrumental music were reported by, among others, Huron and Ollen (2003), McGowan and Levitt (2011), and Hansen, Sadakata, and Pearce (2016), both in similar and different contexts than the ones investigated by Patel et al. (2006). Later studies (e.g., Jekiel, 2014; Lee, Brown, & Müllensiefen, 2017; Van Handel & Song, 2010) have also looked at the link between prosody and vocal music rather than instrumental music with most of these studies’ outcomes supporting the idea that there is a connection between prosody and music. It should be noted here, however, that Temperley’s (2017) findings regarding rhythm in French and Italian vocal music as compared to British and German vocal music patterned in the opposite direction than was expected.

3.1.4 Aims and hypotheses

Inspired by Kautny’s (2015) idea that regional variation in rap flows may be informed by linguistic variation and by Thomas’s (2015) call for research exploring the link between AAE prosody and African-American styles of music, this study aims to establish a number of things that we currently know very little about: how East Coast and West Coast AAE differ regarding prosody, how East Coast and West

Coast rap flows are distinct, and whether prosody and rap flows follow similar patterns when it comes to regional variation. To this end, the following hypotheses were formulated:

- (1) West Coast AAE exhibits more pitch fluctuation than East Coast AAE;
- (2) West Coast rap flows exhibit more pitch fluctuation than East Coast rap flows;
- (3) West Coast AAE exhibits more rhythmic variation than East Coast AAE; and
- (4) West Coast rap flows exhibit more rhythmic variation than East Coast rap flows.

The hypotheses relating to regional variation in rap flows (i.e., hypotheses 2 and 4) follow what little knowledge is available in the literature regarding East Coast and West Coast rap flows' usage of pitch and rhythm (Edwards, 2013). Since no previous research comparing East Coast and West Coast AAE prosody has yet been conducted, hypotheses 1 and 3 are not directly based on previously reported findings. Instead, they are based on Kautny's (2015) suggestion that regional variation in rap flows is informed by regional variation in speech and on Patel et al.'s (2006) finding that British and French prosody differ from each other in the same way that British and French classical music do. Following from these four hypotheses, a fifth, overarching hypothesis was formulated:

- (5) Regional variation in rap flows follows a similar pattern as regional variation in prosody.

To test these hypotheses, free speech and rap recordings of 16 prominent African-American members of the East Coast and West Coast hip-hop communities were phonetically analyzed regarding melody (pitch fluctuation) and rhythm (degree of syllable isochrony, variation across utterances, and musical (micro)timing).

3.2 Method

The materials, data, and several methodological tools described in this section are available at <https://osf.io/dzc3s> (Gilbers et al., 2019b).

3.2.1 Prosody and flow – Melody

The present section describes the methodology used for the part of the study focusing on pitch contours and pitch fluctuation in West Coast and East Coast AAE speech and West Coast and East Coast rap flows.

3.2.1.1 Materials

3.2.1.1.1 Speech

Audio from 16 interviews with prominent African-American rappers from the East Coast and West Coast – eight rappers per coast – was collected from various sources on the internet (e.g., YouTube videos and podcast episodes; see Appendix Table 3.1 for an overview). To limit intracoastal variability, all selected speakers were from either the greater Los Angeles metropolitan area or the greater New York City metropolitan area, the two dominant hip-hop hubs for the West Coast and East Coast, respectively.²¹ The aim was to only include rappers who are widely known among both fanatic and casual hip-hop listeners, and who are held in high regard by fans and critics alike. The “The best rappers from Los Angeles” (n.d.) and “The best New York rappers” (n.d.) lists published on *Ranker.com* were used as a starting point for artist selection, the rankings of which were democratically decided through thousands of online votes. For each list, the researchers took the top 50 and subsequently filtered out all artists that did not fit the study’s demographic criteria (i.e., artists that were not male, African-American, or not originally from the right city) or that were not actually rappers but rather singers (e.g., Nate Dogg) or deejays (e.g., DJ Yella), for instance. Finally, rap groups were filtered out so that only individuals remained on the list. The top 25 rappers per coast that remained after these filters had been applied were placed on a shortlist. From this shortlist, the first 16 artists (8 per coast) for who the researchers found interview recordings and three a capella rap verses of sufficient quality and length were selected.²² All 16 artists

²¹ Throughout this article, we use the terms ‘East Coast’ and ‘West Coast’ despite the fact that our subjects are exclusively from (the greater metropolitan areas of) New York City and Los Angeles. The primary reason for using ‘East Coast’ and ‘West Coast’ is that in hip-hop culture, these terms are usually used in a *totum pro parte* fashion, meaning that they often refer to just New York City and Los Angeles hip-hop.

²² The researchers were limited with regards to who could be selected due to pragmatic reasons. For instance, the rappers Eazy-E (Los Angeles) and Big L (New York) both easily fit the study’s criteria, but could unfortunately not be included because no interviews with them of sufficient audio quality and length were available for the speech analyses. Similarly, no/not enough a capella rap verses of

Table 3.1. Selected West Coast and East Coast rappers.

West Coast	East Coast
Daz Dillinger, Dr. Dre, Ice Cube, Kendrick Lamar, Nipsey Hussle, Snoop Dogg, The Game, Warren G	50 Cent, Biggie Smalls (The Notorious B.I.G.), Fabolous, Jay-Z, Mos Def, Nas, Raekwon, Rakim

that ended up being selected have had considerable commercial and/or critical success, and can undeniably be considered hip-hop ambassadors for their respective regions as a result. Table 3.1 presents an overview of the artists that were selected for analysis.

From the interviews, 15 excerpts of uninterrupted speech (10 to 15 seconds in length) per subject were selected for analysis. None of these excerpts featured other voices than the subjects', nor did they feature any background noise that could possibly interfere with the acoustic measurements.

3.2.1.1.2 Rap

For each of the 16 rappers listed in Table 3.1, three a capella²³ rap verses were collected for pitch analysis online. All of these a capella recordings were so-called “studio a capellas” – officially released a capella recordings by the artists or their labels themselves – or high quality a capellas created by skilled deejays/producers, not the typical “D.I.Y. a capellas” created by mere hobbyists (e.g., by filtering out certain frequencies in an attempt to “cut out” the sound of the instruments). This choice was made because the latter type is usually characterized by many artifacts in the signal which would likely interfere with the study’s pitch analyses. Because the study’s scope is limited to rap vocals, any instances of more traditional singing (i.e., controlled pitch contours of a musical melody) were manually removed from the recordings using Adobe Audition software (Adobe Inc., version 3.0). None of the recordings featured voices that were artificially pitched up or down. Moreover, none of the voices analyzed were auto-tuned – that is, the pitch as performed by the artists was not rounded up or down to the nearest semitone – which is a common feature of contemporary rap (e.g., the work by artists such as Lil Wayne and Future). Whether recordings featured artificially manipulated voices was assessed by carefully examining semitone pitch measurements (i.e., assess whether

sufficient audio quality could be obtained for many of the shortlisted artists (e.g., YG, Mack 10, Vince Staples, and Earl Sweatshirt), making them ineligible for analysis as the researchers’ aim was to study the speech and rap of the same individuals.

²³ In music terminology, a capella refers to vocals unaccompanied by any instrumentation.

Table 3.2. Rap verses selected for pitch analysis.

Subject	Song title	Song artist	Verse (length)
Daz D.	"All I need" (2006)	Daz Dillinger	1 (0:41), 2 (0:42), 3 (0:43)
Dr. Dre	"Nuthin' but a 'G' thang" (1992)	Dr. Dre ft. Snoop Dogg	2 (0:30), 4 (0:40)
	"Still. D.R.E." (1999)	Dr. Dre ft. Snoop Dogg	1 (0:40)
Ice Cube	"It was a good day" (1991)	Ice Cube	1 (0:58), 2 (0:47), 3 (1:09)
Kendrick L.	"Backseat freestyle" (2012)	Kendrick Lamar	1 (0:37), 2 (0:37), 3 (0:40)
Nipsey H.	"Ocean views" (2016)	Nipsey Hussle	1 (0:46), 2 (0:47), 3 (0:48)
Snoop Dogg	"Nuthin' but a 'G' thang" (1992)	Dr. Dre ft. Snoop Dogg	1 (0:56), 3 (0:28)
	"The next episode" (1999)	Dr. Dre ft. Snoop et al.	1 (0:41)
The Game	"Dreams" (2004)	The Game	1 (0:49), 2 (0:49), 3 (0:48)
Warren G	"Regulate" (1994)	Warren G ft. Nate Dogg	1 (0:40)
	"I need a light" (2005)	Warren G ft. Nate Dogg	1 (0:40), 2 (0:41)
50 Cent	"Hustler's ambition" (2005)	50 Cent	1 (0:44), 2 (0:43), 3 (0:43)
Biggie	"Sky's the limit" (1997)	The Notorious B.I.G.	1 (0:43), 2 (0:34), 3 (0:41)
Fabulous	"Baby" (2004)	Fabulous	1 (0:28), 2 (0:37), 3 (0:18)
Jay-Z	"Moment of clarity" (2003)	Jay-Z	1 (0:35), 2 (0:45), 3 (0:46)
Mos Def	"Summertime" (2007)	Mos Def ft. Esthero	1 (1:00), 2 (0:46)
	"Travellin' man" (1998)	DJ Honda ft. Mos Def	1 (0:38)
Nas	"It ain't hard to tell" (1994)	Nas	1 (0:33), 2 (0:32), 3 (0:36)
Raekwon	"Curious" (2006)	Raekwon	1 (1:14), 2 (1:05)
	"New York" (2005)	AZ ft. Raekwon et al.	2 (0:41)
Rakim	"Once upon a rhyme in Japan" (2000)	Nigo ft. Rakim	1 (0:50), 2 (0:49), 3 (0:49)

the semitone pitch measurements featured a disproportionate number of integer values, which would indicate "rounded off," auto-tuned notes) and through auditory examination of the recordings (e.g., listening for the types of audio artifacts that are the natural, unavoidable result of digital pitch manipulation). Table 3.2 presents an overview of the verses used for this study's pitch analyses.

3.2.1.2 Procedure

The speech excerpts and rap verses described above were phonetically analyzed using identical methods. Firstly, fundamental frequency was measured in hertz (Hz) every 10 milliseconds (ms) in Praat (version 6.0.21, Boersma & Weenink, 2016). These measurements were performed automatically using a script that was modified

Table 3.3. Overview of the relationship between (hundredths of) semitones, Hz values, and the new scale's values.

Semitone	Hz	Value
A ₀	55.000 Hz	0
A _{0.01}	55.032 Hz	0.01
A _{0.02}	55.064 Hz	0.02
A _{0.03}	55.095 Hz	0.03
A ₁	110 Hz	12
A ₂	220 Hz	24
A ₃	440 Hz	36

from Cook (2002) to measure pitch 100 times per second rather than only 10 times per second.

Next, the Hz values were converted to a novel logarithmic scale based on semitones because the Hz scale's linear nature does not accurately reflect pitch perception: while the difference between an A₀ note and an A₁ note is 55 Hz and the difference between an A₁ note and an A₂ note is 110 Hz, humans perceive these differences as being equal, namely a difference of 12 semitones (1 octave). Hz-to-semitone conversion was deemed necessary because otherwise the pitch data for two speakers whose voices have a different average fundamental frequency could not be "fairly" compared to each other. The resulting logarithmic semitone scale spans a frequency range of 55 Hz (A₀) until 440 Hz (A₃), which covers the range of male voices' pitch under normal circumstances (approximately one octave below the average until two octaves above the average male fundamental frequency). Because per definition, semitones and octaves can go lower *ad infinitum*, even well beyond the range of human perception, the scale's 0-point was arbitrarily selected to be A₀. The following formula describes the relationship between a given hundredth of a semitone (i.e., cent) and the next hundredth of a semitone in terms of Hz, where x_{n+1} stands for the Hz value associated with the next cent, and x_n stands for the Hz value of the one preceding it:

$$x_{n+1} = x_n \times 2^{1/1200}$$

Every Hz measurement was rounded off to the nearest corresponding cent value and subsequently converted to the corresponding value on the new scale (see Table 3.3).

After conversion to the new semitone-based logarithmic scale, pitch contours for all speech excerpts and rap verses were plotted to allow for visual comparison of the degree of pitch fluctuation. Moreover, absolute delta scores (i.e., the difference between one measurement and the next measurement 10 ms later) were

assessed to quantify the intensity of pitch fluctuation. Delta scores higher than five semitones per 10 ms were removed from the data, as pitch jumps of that size within a hundredth of a second are highly unlikely to be reflective of actual pitch production in speech. Rather, these are often the result of Praat erroneously measuring so-called octave jumps (Praat occasionally registers a pitch decrease of, say, two semitones as a 10-semitone increase) or Praat accidentally picking up the pitch from non-speech background noise.

3.2.2 Prosody and flow – Rhythm

This subsection deals with the methodology used for the part of the study focusing on rhythmic variation in West Coast and East Coast AAE speech and West Coast and East Coast rap flows.

3.2.2.1 Materials

3.2.2.1.1 Speech

For each of the 16 speakers mentioned in Table 3.1, five excerpts (10 to 15 seconds in length) were selected for rhythmic analysis. For each rapper, these five excerpts were the same as their first five (out of 15) excerpts used for the pitch analyses.

3.2.2.1.2 Rap

For each of the 16 rappers, 16 musical bars from a single verse were selected for analysis.²⁴ All selected verses came from prominent songs in the rappers' careers. Table 3.4 provides an overview of the rap verses used for rhythmic analysis. Contrary to the rap verses selected for pitch analysis, full studio recordings rather than a capella verses were used because instrumental accompaniment allowed for more accurate division of the verses into separate bars (see the Procedure subsection below for details).

3.2.2.2 Procedure

3.2.2.2.1 Speech

Because of the inherent problems involved with assessing individual consonants in field recordings and determining where one syllable begins and the next one ends, it was decided to assess rhythmic variability in speech based on vowel duration, which is considered a generally robust variable that is relatively easy to measure

²⁴ If a selected verse happened to be longer than 16 bars, only its first 16 were analyzed.

Table 3.4. 16 bar (excerpts of) rap verses selected for rhythmic analysis.

Subject	Song title	Song artist	Verse (length)
Daz D.	"Got my mind made up" (1996)	2Pac ft. Daz Dillinger et al.	1 (0:41)
Dr. Dre	"Let me ride" (1992)	Dr. Dre ft. Snoop Dogg et al.	1 (0:41)
Ice Cube	"It was a good day" (1991)	Ice Cube	1 (0:46)
Kendrick L.	"m.A.A.d. city" (2012)	Kendrick Lamar ft. MC Eiht	2 (0:42)
Nipsey H.	"Last time that I checc'd" (2018)	Nipsey Hussle ft. YG	1 (0:40)
Snoop Dogg	"Gz and hustlas" (1993)	Snoop Dogg ft. Nanci Fletcher	1 (0:42)
The Game	"Dreams" (2004)	The Game	1 (0:49)
Warren G	"Party we will throw now" (2012)	Warren G ft. Nate Dogg et al.	2 (0:39)
50 Cent	"Hustler's ambition" (2005)	50 Cent	1 (0:43)
Biggie	"Machine gun funk" (1994)	The Notorious B.I.G.	1 (0:40)
Fabulous	"So N.Y." (2012)	Fabulous	1 (0:44)
Jay-Z	"Feelin' it" (1996)	Jay-Z ft. Mecca)	1 (0:46)
Mos Def	"Mathematics" (1999)	Mos Def	1 (0:41)
Nas	"N.Y. state of mind" (1994)	Nas	1 (0:45)
Raekwon	"C.R.E.A.M." (1993)	Wu-Tang Clan	1 (0:42)
Rakim	"Don't sweat the technique" (1991)	Eric B. & Rakim	1 (0:36)

(see Thomas & Carter, 2006 for a more extensive description of this). These measurements were performed manually, since a test run using several Praat scripts to automate measurements resulted in too many erroneous assessments. Following Thomas and Carter (2006), if a syllable's nucleus was not occupied by a vowel but by a syllabic consonant, the duration of this syllabic consonant was measured. A total of 4077 syllables were measured this way (2070 for West Coast AAE and 2007 for East Coast AAE).

The present study's approach to quantifying rhythmic variability in speech constitutes a modified version of the methods described in Thomas and Carter (2006), Patel and Daniele (2003), and Patel et al. (2006). As there are many dimensions to rhythm and rhythmic variability, it was decided to analyze variability not through only one but through two different measurements that analyze variability from a different perspective. The first of these is the normalized pairwise variability index (nPVI; Patel & Daniele, 2003; Patel et al., 2006), a measurement based on the pairwise variability index measurement developed by Low, Grabe, and Nolan (2000). The nPVI measurement reflects variability across the stress-timed/syllable-timed continuum (i.e., how similar in length a language variety's stressed and unstressed syllables are) with higher values indicating relatively higher levels of stress-timedness. Patel et al. (2006, p. 3035) designed the formula to calculate nPVI scores as follows:

$$\text{nPVI} = \frac{100}{m-1} \times \sum_{k=1}^{m-1} \left| \frac{d_k - d_{k+1}}{\frac{d_k + d_{k+1}}{2}} \right|$$

Here, m stands for the number of durational elements in a sequence and d_k represents the k th element's duration. As Patel et al. describe it, the “nPVI computes the absolute difference between each successive pair of durations in a sequence, normalized by the mean duration of the pair” (2006, p. 3035), technically making it a contrastiveness index. As Thomas and Carter (2006) note, one of the advantages of working with this measurement is that it controls for overall speech rate, allowing for comparisons of speakers with different speech rates, or even for comparing multiple phrases by a single speaker who varies greatly regarding tempo.

The second measurement is the coefficient of variation (CV) measurement, which is equal to a data set's standard deviation divided by its mean. As such, it is a normalized version of the standard deviation measurement, and hence it allows for fair variation comparisons across subjects regardless of the size of their mean scores (Segalowitz & Hulstijn, 2005; Segalowitz, Poulsen, & Segalowitz, 1999). CV was chosen to be used alongside the nPVI measurement because unlike the nPVI measurement, it can describe overall degrees of variation across a whole utterance rather than merely compare adjacent syllables' durations.

3.2.2.2.2 Rap

When engaging in the analysis of rhythmic variability in rap flows, one inadvertently runs into a number of methodological issues that require creative solutions. For starters, it is highly difficult to apply the same methodology to rap flows as the one described above for speech. In order to get an accurate representation of the rhythms of rap flows, one needs to analyze them in conjunction with the beats they are rapped over (Adams, 2015; Krims, 2000). However, to accurately analyze vocals phonetically using Praat (Boersma & Weenink, 2016), recordings without any instrumentation are required, since the wave forms of the instruments would otherwise obscure those of the voice.

Considering the abovementioned, direct phonetic analysis of rap flow rhythms using Praat is not a viable option, which is why an alternative representation of rap flows is required: musical notation of some kind, be it traditional (i.e., sheet music) or a novel, less conventional method. The mechanics of traditional Western music notation – which is primarily concerned with melody instead of rhythm – are notoriously cumbersome to describe the rhythmic subtleties of rap flows, which is

why the field of hip-hop musicology has seen myriad attempts to notate flows in non-traditional ways (Adams, 2015; Connor, 2018). To illustrate, Krims (2000) and Adams (2009) use a grid system which divides bars into sixteen subunits (at times adapting the grid to allow for the notation of, for instance, triplets). Kautny (2015), on the other hand, switches between more traditional notation and a more complicated version of Adams's grid system (which schematically reflects microtiming by placing words slightly before or after grid boundaries) depending on what he intends to illustrate. Edwards (2013) relies on a simpler grid that marks the location of a bar's four beats and relies mostly on deviating spelling to illustrate rhythmic abnormalities. Even when rap scholars do take a more traditional route to analyzing flow, they often have to resort to creative methods in order to accurately represent rappers' rhythms. Connor (2018), for instance, represents rappers' microtiming using traditional Western music notation, but does so in a sophisticated yet highly unusual manner by analyzing all bars in terms of nonuplets.

While all these approaches offer great insights into rappers' rhythms (and to varying degrees into their microtiming), they were not designed and are hence not suited to describe the exact microtiming that rappers display, especially when the researcher's aim is to quantitatively compare the microtiming of different (groups of) rappers. In a sense, this is reminiscent of the distinction between the linguistic fields of phonology and phonetics: while phonology deals with the sound structure of speech, phonetics deals with the actual acoustic realizations of speech, with only the latter allowing for quantitative data analysis. What was needed for this study was to create an approach based on the actual realizations of rap rhythms rather than an approach based on rap rhythms' underlying structures. As the study is a quantitative one, representations of flow not only needed to be faithful to the rappers' microtiming, but they needed to be quantifiable as well. To this end, a new methodology was designed based on a system that will be greatly familiar to musicians involved with electronic music production: Musical Instrument Digital Interface (MIDI) – the music industry standard for communication between digital instruments and music software. Given that MIDI is not dependent on tempo (see below for a more detailed discussion of this), the newly designed method not only allows for highly accurate representations of rappers' rhythmic subtleties, it also allows for the quantification of these subtleties so that rappers' flows can be compared to those of others as well as be statistically analyzed. Below, a detailed description of the new method is presented.

3.2.2.2.1 MIDI-based method of rhythmic flow analysis

For each of the selected verses, the corresponding song was extracted in its entirety in WAVE format (.wav) and loaded into the digital audio workstation software Maschine version 2.3 (Native Instruments, 2015).²⁵ Using Maschine's on-board sampling interface, the exact start of the target verse's first bar and end of its sixteenth were determined through careful examination of the waveforms and the song's audio itself, and the rest of the song was deleted afterwards. Next, the song's beats per minute (BPM) value was determined manually through the software's "BPM tap" feature and further tweaked to ensure that the software would play back the 16 bar excerpt in the correct tempo (i.e., that it would play back the excerpt as a perfect musical loop without any "stuttering" in the rhythm as the sample would start its next loop). The following step involved automatically dividing the excerpt into 16 separate units (each forming a single, perfectly looping bar) using the "Slice" tool of Maschine's on-board sampler (see Figure 3.1 for a screenshot of this process). The final preparatory step involved loading sonically unobtrusive percussive sounds (heavily low-pass filtered snare drums) onto each drum pad of the Maschine Mikro Mk 2 controller (Native Instruments, 2015).²⁶

Next, the rhythms of each bar's rapping were recreated in MIDI. The first step of this process, which was repeated for each bar, involved the researcher²⁷ carefully listening to the looping bar to get a good, general understanding of the artist's rapping style. Next, an approximated recreation of the rapper's microtiming was performed manually using a technique called "finger drumming" (rhythmically tapping electronic drum pads) and recorded in MIDI-format. Pads were played whenever the rapper made a syllable "land," which roughly corresponds to the moment when a syllable reaches the amplitude peak of its nucleus. Once the timing of all of a bar's syllables was recreated and recorded this way, the researcher would play back the MIDI recording using the previously mentioned unobtrusive percussive sounds alongside the original recording, all the while scrutinizing each

²⁵ Note that while Maschine (Native Instruments, 2015) was used in this study, most professional digital audio workstations (e.g., Cubase, Ableton, Logic Pro, and FL Studio) are capable of performing the basic functions required for this method to work if they support Musical Instrument Digital Interface (MIDI) and especially when controlled with a MIDI controller (e.g., a keyboard or electronic drum pads), although perhaps not as intuitively or efficiently as Maschine can.

²⁶ While a Maschine Mikro Mk 2 controller was used for the present study, any alternative Maschine controller would have worked as well.

²⁷ The rhythmic analyses were conducted by this article's first author, a rapper and hip-hop musician himself with years of studio experience.

Figure 3.1. Splicing Nipsey Hussle’s verse into 16 separate units using Maschine’s ‘Slice’ tool.

Table 3.5. Overview of how MIDI tick values correspond to musical temporal units and how they correspond to time in milliseconds (based on a typical 90 beats per minute (BPM) hip-hop tempo).

Note duration	Duration in MIDI ticks	Duration in seconds (90 BPM)
1 note (i.e., a single 4/4 bar)	3840	2.667
1/2 note	1920	1.333
1/4 note (i.e., one beat)	960	0.667
1/8 note	480	0.333
1/16 note	240	0.167
1/32 note	120	0.083
1/64 note	60	0.042
1/128 note	30	0.021
1/256 note	15	0.010

and every MIDI note’s timing and tweaking their temporal position if necessary (i.e., moving a note forward or backward so that it aligned with the rapper’s timing as closely as possible). It should be noted here that Maschine’s temporal MIDI resolution is extremely high, namely 960 “ticks” or “pulses” per quarter note, so these temporal tweaks can be highly precise.²⁸ Table 3.5 presents an overview of how MIDI tick values correspond to actual musical temporal units (i.e., note durations) and duration in seconds for a typical 90 BPM hip-hop tempo.

To illustrate the method’s precision, first consider Figures 3.2A and 3.2B, which show a single bar from Nas’s song “N.Y. state of mind” (Jones & Martin, 1994) and the late Nipsey Hussle’s song “Last time that I checc’d” (Asghedom & Jackson, 2018) represented in traditional music notation, respectively.

²⁸ See Dobrian (2014) for a detailed discussion of how Musical Instrument Digital Interface’s temporal resolution works.

Figure 3.2. (A) First bar of the first verse on Nas’s “N.Y. state of mind” (1994); (B) Tenth bar of the first verse of Nipsey Hussle’s “Last time that I checc’d” (2018).

Figure 3.3. Nas’s first bar and Nipsey Hussle’s tenth bar represented using the present study’s MIDI-based approach – the bar grid is divided into four beats, with 1.1 standing for the bar’s first beat, 2.1 for its second beat, etc., and further subdivided in sixteenth notes; the rappers’ microtiming is represented with a temporal resolution of 256th notes.

Both bars start with a single sixteenth rest, followed by a barrage of sixteenth notes (15 in the case of Nas, 14 in the case of Nipsey Hussle, who ends the bar with another sixteenth rest). These transcriptions suggest that rhythmically speaking, these bars are nearly identical and rhythmically invariable (i.e., rapid-fire flows without any syncopation). In contrast, Figure 3.3, which was created using this study’s MIDI-based approach, presents a representation of these bars along a grid with 16 subunits (cf. Adams, 2009; Krims, 2000, etc.) in which each black bar represents the temporal location of each of the verses’ notes rounded off to 256th notes for illustrative purposes.

Two things become apparent from inspecting Figure 3.3. Firstly, both rappers syncopate their notes – that is, none of the notes are performed straight on the beat, nor are the temporal distances between them the same each time – a rhythmic detail glossed over by the traditional music notation of Figures 3.2A and 3.2B above. Secondly, the two rappers substantially differ from each other in terms of microtiming. In other words, the MIDI-based method revealed that two bars which seemed to be nearly identical at first glance were actually examples of two remarkably different flows.

Once these steps were completed for all 16 bars, the MIDI recordings were exported in MIDI-format. Next, the binary MIDI files were converted to text files using a script capable of extracting numerical MIDI tick data available online (Flash

Music Games, 2018). These data detail on which MIDI “tick” each syllable was performed. To illustrate, if a note was performed right on the first count of a bar, the MIDI tick value would be 0, if it fell exactly after one sixteenth rest, its value would be 240, etc. These data were entered into Excel, after which the interval distances between adjacent notes’ temporal locations for each bar were calculated in terms of MIDI ticks. The measurement of choice for the rhythmic analysis of rap flows was the CV one described earlier. While Patel et al. (2006), in their study on the rhythms of French and British English speech in relation to the rhythms of French and British classical music, opted to analyze musical rhythm using the nPVI measurement, it was decided not to take this approach for the present study (see the Discussion section below for a detailed explanation as to why).

To test the reliability of our rhythmic analyses, two additional raters were recruited to recode a quarter of the dataset (two randomly selected rappers per coast, namely Dr. Dre, Snoop Dogg, Jay-Z, and Nas). The first of these was a phonologist with a background in music but only a rudimentary knowledge/understanding of hip-hop and rap music. The second was a hip-hop producer, programmer, and radio host who is not involved with research or academia, but who does have extensive knowledge about hip-hop music and culture. Neither of these coders had been involved with the study so far, nor were they aware of the study’s hypotheses at the time the inter-coder reliability tests took place. They were merely taught how the MIDI-based method worked and subsequently executed it. The results of this inter-coder reliability test are presented in the Results section below.

3.2.3 Statistical analysis

The data were statistically analyzed using one-sided independent samples *t*-tests and the Mann-Whitney *U* test. When two dependent variables correlated with each other and represented a part of the same theoretical construct, a multivariate analysis of variance was performed, as well as subsequent analyses of covariance (ANCOVAs). Inter-coder reliability for the MIDI-based method was assessed by calculating intraclass correlation coefficient estimates and their 95% confidence intervals based on a single-measures, absolute-agreement, two-way mixed-effects model. All analyses were performed using SPSS 20 (SPSS Inc. Chicago, IL).

3.3 Results

In this section, the results of the comparisons between East Coast AAE and West Coast AAE speech prosody and East Coast and West Coast rap flows are presented, firstly regarding melody for speech and rap, and secondly regarding rhythm for

speech and rap. They are visually presented together in Figure 3.4 with mean group values, individuals' mean values, and statistical significance indicated.

3.3.1 Melody

3.3.1.1 Melody – Speech prosody

This subsection deals with pitch fluctuation in speech. As such, it is linked to the study's first hypothesis, that is, that West Coast AAE exhibits more pitch fluctuation than East Coast AAE.

To test the hypothesis that West Coast AAE exhibits more pitch fluctuation than East Coast AAE, a one-sided independent samples *t*-test was performed. In the current study, West Coast AAE, with a mean pitch fluctuation slope of 0.298 semitones per every 10 ms ($SD = 0.030$), exhibited significantly more pitch fluctuation than East Coast AAE, with a mean pitch fluctuation slope of 0.262 semitones per every 10 ms ($SD = 0.025$), $t(14) = 2.263$, $p = .01$, $d = 1.303$ (see Figure 3.4A). Figures 3.5A and 3.5B provide examples of these pitch contour plots for West Coast and East Coast AAE speech, respectively. These pitch contour plots, which were created using the semitone-based logarithmic scale designed for this study, illustrate the differences in West Coast and East Coast AAE pitch fluctuation reported above. Compared to the East Coast AAE examples, the peaks, valleys, and the magnitude of the slope of the West Coast AAE examples are visibly more extreme. Note that the vertical axes of Figures 3.5A and 3.5B both encompass the same pitch range (20 semitones) and that the horizontal axes both cover the same amount of time in seconds (12 seconds), allowing for “fair” visual comparison of the pitch contours.

Figure 3.4. (A) Distribution of average pitch fluctuation per 10 ms (semitones) for speech; (B) distribution of average pitch fluctuation per 10 ms (semitones) for rap; (C) distribution of average rhythmic variation (CV) for speech; (D) distribution of average rhythmic variation (CV) for rap; (E) distribution of average rhythmic variation (nPVI) for speech – horizontal lines indicate group mean values; asterisks indicate significant differences.

Figure 3.5. (A) West Coast AAE speech pitch contour example – Snoop Dogg (excerpt 5): “You got three homeboys, right? These two you grew up with, these two gangbangin’, uhm, four years down the line. Them your homeboys, you love ‘em like brothers. They know your mom and daddy. When the– when the others said come by to ride...”; (B) East Coast AAE speech pitch contour example – Jay-Z (excerpt 5): “And in between all that stress and angst and, you know, having to deal with one another in such close proximity, there’s so much love, and there was playing in the Johnny Pump, and there was, uh...”

3.3.1.2 Melody – Rap flows

This subsection deals with pitch fluctuation in rap flows. As such, it is linked to the study’s second hypothesis, namely that West Coast rap exhibits more pitch fluctuation than East Coast rap.

To test the hypothesis that West Coast rap flows exhibit more pitch fluctuation than East Coast rap flows, a one-sided independent samples *t*-test was performed. In the present study, West Coast rap was found to exhibit an average pitch fluctuation slope of 0.320 semitones per every 10 ms ($SD = 0.060$), and East Coast rap a mean fluctuation slope of 0.285 ($SD = 0.012$; see Figure 3.4B). West Coast rap’s greater pitch fluctuation compared to East Coast rap’s is illustrated by the pitch contour plots of Figures 3.6A (Dr. Dre) and 3.6B (Biggie Smalls), respectively. From inspection of Figure 3.4B, it is immediately obvious that one subject of the West Coast group exhibited markedly different pitch fluctuation levels than his peers. This subject was Kendrick Lamar, and in fact, his average pitch fluctuation of 0.202 semitones per every 10 ms was not only the lowest of the West Coast group, but also far lower than the pitch fluctuation of any of the East Coast rappers. While

Figure 3.6. (A) West Coast rap pitch contour example – Dr. Dre’s “Nuthin’ but a ‘G’ thang” (Young, Broadus, Jr., & Curry, 1992; verse 1, excerpt): “Peepin’, and I’m creepin’, and I’m creepin’ / But I damn near got capped, ‘cause my beeper kept beepin’ / Now, it’s time for me to make my impression felt / So sit back, relax, and strap on your seatbelts / You never been on a ride like this before...”; (B) East Coast rap pitch contour example – Biggie Smalls’s “Sky’s the limit” (Wallace et al., 1997; verse 3, excerpt): “After realizin’ to master enterprisin’ / I ain’t have to be in school by ten, I then / Began to encounter with my counterparts / On how to burn the block apart, break it down into sections...”

the West Coast rap excerpts exhibited, on average, more pitch fluctuation than the East Coast rap excerpts, this was not a significant difference, $t(14) = 1.582$, $p = .068$, $d = 1.303$. An explorative one-sided independent samples t -test with Kendrick Lamar’s rap flow data excluded was thus performed to gain a better understanding of how Lamar’s data point affected the comparison between coasts. If Lamar’s data had been excluded, West Coast rap’s average pitch fluctuation would have been 0.337 semitones per every 10 ms ($SD = 0.040$) compared to East Coast rap’s 0.285 ($SD = 0.012$), which would have been a significant difference, $t(13) = 3.241$, $p = .007$, $d = 1.723$.

3.3.2 Rhythm

3.3.2.1 Rhythm – Speech prosody

This subsection deals with rhythmic variation in speech. As such, it is linked to the study’s third hypothesis, namely that West Coast AAE exhibits more rhythmic variation than East Coast AAE.

The hypothesis that West Coast AAE speech is characterized by more rhythmic variation than East Coast AAE was tested using two measurements, namely nPVI (a measurement which represents how stress-timed/syllable-timed a language variety is) and CV (a measurement which, as used in this study, reflects rhythmic variability across utterances). To test the hypothesis that West Coast AAE is more rhythmically variable than East Coast AAE along the stress-timed/syllable-timed continuum, a one-sided independent samples *t*-test was performed. West Coast AAE speech was found to exhibit a significantly higher nPVI score than East Coast AAE, namely 64.629 ($SD = 3.565$) compared to 54.238 ($SD = 4.211$) respectively, $t(14) = 5.326$, $p < .001$, $d = 2.663$ (see Figure 3.4E). To test the hypothesis that West Coast AAE shows more rhythmic variation than East Coast AAE across entire utterances, a one-sided Mann-Whitney *U* test was performed. West Coast AAE speakers displayed significantly more rhythmic variation across utterances than the East Coast AAE speakers did in terms of syllable duration CV values, namely 0.614 ($SD = 0.061$) and 0.527 ($SD = 0.050$) respectively, $U = 7.000$, $p = .004$ (see Figure 3.4C).

“Speech rhythm nPVI” and “speech rhythm CV” were found to correlate with one another significantly, $r = 0.627$, $p = .009$. Considering that these two variables both measure rhythmic variation in speech but from different perspectives, they were not just analyzed separately but also together by means of a multivariate one-way ANOVA. A statistically significant difference in speech rhythm based on coast was found when analyzing the two variables together, $F(2,13) = 14.853$, $p < .001$, Wilks’ lambda = 0.304, partial $\eta^2 = 0.696$. In other words, roughly 70% of the rhythmic variation observed in speech can be explained by which coast the speakers are from. Next, the unique contributions towards predicting which coast a speaker is from were teased apart for the two speech rhythm variables by means of two ANCOVAs. The result of the ANCOVA performed with “coast” as the independent variable, “speech rhythm nPVI” as the dependent variable, and “speech rhythm CV” as the covariate was significant, $F(1,13) = 12.286$, $p = .04$. The result of the ANCOVA performed with “coast” as the independent variable, “speech rhythm CV” as the dependent variable, and “speech rhythm nPVI” as the covariate was not significant, $F(1,13) = 1.113$, $p = .311$. This means that while both groups differ from each other significantly regarding rhythmic variability in speech on the basis of either nPVI or CV, some of the regional variation is only explained by “speech rhythm nPVI” and not by “speech rhythm CV,” whereas the opposite is not the case.

3.3.2.2 Rhythm – Rap flows

This subsection deals with rhythmic variation in rap. As such, it is linked to the study's fourth hypothesis, namely that West Coast rap exhibits more rhythmic variation than East Coast rap.

3.3.2.2.1 Inter-coder reliability investigation

The inter-coder reliability investigation for this study's MIDI-based method of analyzing rhythm in rap revealed that the two re-coders' measurements were, on average, slightly later than the main coder's, namely 10.59 and 8.25 MIDI ticks, which corresponds to 7 ms and 6 ms, respectively (based on a 90 BPM tempo). These are minuscule timing differences, below the just-noticeable-difference-levels for rhythmic timing reported by Friberg and Sundberg (1993), which suggests high agreement among the three coders.

The interval values that resulted from the main coder's as well as the first and second re-coders' coding were statistically analyzed by calculating intraclass correlation coefficient estimates and their 95% confidence intervals based on a single-measures, absolute-agreement, two-way mixed-effects model. An intraclass correlation of 0.95 (95% confidence interval: 0.94–0.96) was found, $F(709, 1418) = 57.54$, $p < .001$. Following the guidelines provided by Koo and Li (2016), this indicates that there was excellent inter-coder reliability, the highest reliability level listed in said guidelines.

3.3.2.2.2 Rhythmic variation in West Coast and East Coast rap

To test the hypothesis that West Coast rap flows exhibit more rhythmic variation than East Coast rap flows, a one-sided independent samples t -test was performed. The West Coast subjects displayed significantly more rhythmic variation in their rap verses than the East Coast subjects did in terms of note interval CV values, namely 0.495 ($SD = 0.050$) and 0.457 ($SD = 0.030$) respectively, $t(14) = 1.863$, $p = .044$, $d = 0.932$ (see Figure 3.4D).

West Coast rap's higher degree of rhythmic variability as reported above is illustrated by the following representations of rappers' rhythms (Figure 3.7). They show how Jay-Z (East Coast) is quite steady regarding the note length (almost exclusively sixteenths) while Snoop Dogg (West Coast) switches between note lengths multiple times (sixteenths and thirty-seconds) while also using rests, leaving more "space" in the bar. Furthermore, despite some syncopation, Jay-Z's rapping is

Figure 3.7. Rap rhythm plot examples – Snoop Dogg (West Coast; ninth bar from “Gz & hustlas”, 1993) and Jay-Z (East Coast; seventh bar from “Feelin’ it”, 1996) – the bar grid is divided into four beats, with 1.1 standing for the bar’s first beat, 2.1 for its second beat, etc., and further subdivided in sixteen notes; the rappers’ microtiming is represented with a temporal resolution of 256th notes.

much more “straight on the beat” than Snoop Dogg’s is, as the latter’s delivery is “late” for nearly every note.

3.3.3 Melody and rhythm combined – speech prosody and rap flows

Following Patel et al. (2006), this subsection will examine melody and rhythm together in light of the study’s fifth hypothesis (i.e., that regional variation in rap flows follows a similar pattern as regional variation in prosody). Figure 3.8 presents the two plotted together on a two-dimensional space for West Coast AAE, East Coast AAE, West Coast rap, and East Coast rap, with average melodic variation (pitch fluctuation per 10 ms in semitones) plotted along the horizontal axis and overall rhythmic variation (CV) plotted along the vertical axis. Interestingly, it can be observed that compared to speech, rap exhibited *more* melodic variation but *less* rhythmic variation.²⁹

The prosodic distance (p.d.) between West Coast AAE and East Coast AAE prosody (WC_s, EC_s) – that is, the Euclidean distance between the points representing the mean melodic and rhythmic (CV) values – can be calculated using the following formula adapted from Patel et al. (2006):

$$p.d.(WC_s, EC_s) = \sqrt{(Melody_{WC_s} - Melody_{EC_s})^2 + (Rhythm_{WC_s} - Rhythm_{EC_s})^2}$$

The p.d. between West Coast AAE and East Coast AAE speech prosody was found to be 0.094 rhythm–melody units. Applying the same formula to the rap data shows that the distance between West Coast and East Coast rap flows was 0.052 rhythm–

²⁹ It should be noted here that the rhythmic variation CV values for speech and rap are not perfectly comparable, as these are based on related but nevertheless distinct variables: vowel duration for speech and note interval duration for rap. This subtle difference between the measurements might have influenced these results, although CV – being dimensionless (Patel et al., 2006) – is a relatively robust variable across domains.

Figure 3.8. Melodic variation (pitch fluctuation slope per every 10 ms; x-axis) and rhythmic variation (CV; y-axis) for West Coast AAE and rap (gray) and East Coast AAE and rap (white) – error bars show standard errors.

melody units. The musical distance between the West Coast and East Coast was thus smaller than the linguistic distance (roughly 55% the size of the linguistic difference).

If one were to draw a line connecting East Coast AAE speech and West Coast AAE speech in the rhythm–melody space, this line would lie at a highly similar angle to a line connecting East Coast and West Coast rap flows. The two lines would move in the same direction (towards greater melodic variation and greater rhythmic variation). In fact, the angle between the two vectors (i.e., the vector for East Coast-to-West Coast AAE speech and the vector for East Coast-to-West Coast rap) is small: only 20.2° (calculated using standard trigonometric formulas).

Plotting the individual subjects' displays of melodic and rhythmic variation for speech (Figure 3.9A) and for rap (Figure 3.9B) reveals that the groups largely occupy distinct areas of the two-dimensional rhythm–melody space in both domains (although plenty of variation can be observed along each dimension). This is most clearly the case for speech, as Figure 3.9A shows a complete separation between the two groups in this space, but it can also be seen to be the case for the domain of rap,

Figure 3.9. (A) Melodic variation in speech (pitch fluctuation slope per every 10 ms; x-axis) and rhythmic variation (nPVI; y-axis) for West Coast AAE prosody (gray) and East Coast AAE prosody (white), plotted per subject; (B) Melodic variation (x-axis) and rhythmic variation (note interval CV values; y-axis) for West Coast rap flows (gray) and East Coast rap flows (white), plotted per subject.

with one exception: Warren G, a West Coaster who finds himself right in the middle of the East Coast group. Figure 3.9B also clearly shows how Kendrick Lamar follows his West Coast peers in terms of rhythm but deviates from every other subject in terms of melody in rap. The rhythm–melody plots suggest that the regional characteristics of these regions’ prosody and flow may be defined not by melody and rhythm separately, but by their melodic and rhythmic characteristics together.

3.4 Discussion

In this section, the current study’s results will be discussed in light of its hypotheses and the existing literature. Moreover, the novel elements of its methodology will be evaluated, for instance its MIDI-based rhythmic flow analyses.

3.4.1 Discussion of method

In this study, both speech and rap were analyzed in terms of melodic and rhythmic variation using a combination of existing methods and methods newly designed for the present study. This subsection will discuss the study’s methodology in light of previous research while also looking at possible future applications of its novel methods.

3.4.1.1 Comparison with previous approaches

Patel et al.’s (2006) methodology lies at the core of that of the present study. Nevertheless, our study’s methodology differs from Patel et al.’s methodology in a number of ways (aside from the different linguistic context and the fact that the present study deals with rap vocals rather than classical music). For one, Patel et al. were unable to directly compare the music of composers such as Debussy, Holst, and Roussel to the way these composers spoke, since their subjects all passed away before speech recordings became possible or common. In contrast, the music and speech analyzed in the present study were produced by the same individuals, allowing for more direct comparisons of the domains of language and music, especially since instead of sheet music (for instrumental music), actual vocal music performances were analyzed in the present study for both the melodic and rhythmic domains. Since vocal rather than instrumental music was analyzed in this study, it was arguably more likely that a connection between speech and music would be found in the present study’s context than in Patel et al.’s study, although it should be noted that, as was mentioned in subsection 3.1.3, the results of previous studies dealing with vocal music were not always entirely predictable.

It is worth noting here that Patel et al. (2006) and the present study differ regarding the degree to which the music that was analyzed is improvisational. While both classical compositions and rap compositions are often carefully constructed, classical compositions are completely formalized in the sheet music, whereas rap compositions often leave room for improvisations in terms of microtiming, or may even be composed entirely in an improvisational fashion during the actual recording process. For example, artists such as Snoop Dogg are known for (partly) freestyling many of their verses. In fact, Snoop Dogg himself told MTV News that the lyrics and flow of the song we rhythmically analyzed for the present study – “Gz and hustlas” – were completely freestyled (Markman, 2013):

“Gz and hustlas” was easy, (...) it was supposed to be a mic check. I was just supposed to go in there and mic check. And when I mic checked, I freestyled, and whatever came out is the record that you hear.

As such, the present study’s focus on rap means that it extends the existing literature on the language–music connection into the domain of improvisational music.

Regarding rhythm, Patel et al.’s (2006) methodology differs from the current study’s in that Patel et al. (2006) used the nPVI measurement for both speech and music, whereas the current study only uses it for speech. The reason for this is that, as Thomas and Carter (2006) asserted, one of the characteristics of the nPVI measurement is that it normalizes for overall speech rate. While this is beneficial when analyzing rhythmic variation in speech, which is naturally marked by changes in tempo throughout, the same is not the case for rap. This is because in hip-hop music, speech rate is already normalized because the rhythms of rappers’ flows are guided by a constant rhythm – the steady beat of the music. The nPVI’s normalization of tempo changes is therefore: (1) redundant; and (2) potentially harmful as it could obscure meaningful aspects of rhythmic variation produced by rap artists. The nPVI’s speech rate normalization also does not benefit comparability of rap verses of different tempos, since this is already taken care of by MIDI itself. MIDI automatically allows for a direct comparison between the timing in rap verses marked by different tempos in terms of BPM, as it keeps track of musical timing in terms of musical units rather than time in, say, seconds or milliseconds: a note starting after a sixteenth rest will have a tick value of 240 regardless of whether the music has a BPM value of 90, 127, or even 180.

Regarding melody, the present study’s metrics differ from Patel et al.’s (2006) as well, as the latter did not analyze entire pitch contours but analyzed strong

abstractions of these contours instead: Patel et al. (2006) only considered pitch in vowels and assigned either a level tone or a glide to each individual vowel using a *glissando* threshold based on perceptual research on pitch movement (Hart, 1976; Mertens, 2004). While insightful, this approach removes the subtle details of pitch contours, which is why a different approach was taken in the present study.

3.4.1.2 Methodological innovations

With regards to melody, our study proposes a semitone-based pitch scale that allows for perceptually accurate plotting of pitch contours. Additionally, a new way of articulating the intensity of pitch fluctuation was developed for this study, namely in terms of delta scores for pitch measurements in (hundredths of) semitones. The temporal resolution of these delta scores was 10 ms, meaning that pitch changes were assessed 100 times per second. This measurement was found to quantitatively reflect what could be visually observed from the pitch contour plots, namely that average delta scores were higher for pitch contours that were visibly less stable compared to more steadily developing pitch contours. Note that this measurement only captures one aspect of pitch fluctuation: its intensity. It does not, however, capture when rises and falls in pitch occur. It also does not say anything about larger “waves” of pitch fluctuation (i.e., whether a speaker’s average pitch is consistent across phrases or whether some phrases are marked by higher mean pitch levels than others).

The study’s rhythmic analyses of speech employ existing methods and parameters (i.e., nPVI and CV values based on vowel duration measurements; see the method of Patel et al., 2006, for example). However, for the rhythmic analyses of rap, no method existed yet that could sufficiently grasp the rhythmic nuances of rap performances while allowing for quantitative analyses. For this reason, a MIDI-based method of analyzing rhythmic variation and microtiming in rap flows was developed, which is arguably this study’s biggest methodological innovation.³⁰ The approach allows for accurate representation of microtiming in rap flows due to

³⁰ It is worth noting here that Musical Instrument Digital Interface (MIDI)-based methods have been employed in previous research, for instance to test how accurately people can synchronize their finger tapping with auditory stimuli (see, for instance, Repp, 1999). As such, the innovation of the presently proposed method does not lie in the fact that it uses MIDI. Rather, it lies in aspects such as the method’s loop-based approach, the fact that music of different tempos can be directly compared to each other without a need for any temporal normalization, the multiple applications, analyses and visualizations that it lends itself to, and the fact that it allows for the analysis of artists’ actual timing rather than merely the abstract rhythms portrayed in sheet music.

rappers or rappers from different regions or eras. Examples of such heat maps based on the present study's data are presented in Figure 3.10. Figures 3.10A and 3.10B show individual rappers' average flows (West Coast and East Coast, respectively). Figure 3.10C, which provides heat maps based on coastal averages, reveals that East Coast rappers generally tend to "hit" each eighth count of a bar, whereas West Coast rappers are less likely to do so (especially near the end of bars) and show a more equal frequency distribution across all 64th notes, which indicates greater levels of rhythmic variation.

3.4.2 Discussion of results

Four hypotheses were formulated for this study, the first two of which are related to the domain of melody and the latter two of which are related to the domain of rhythm:

- (1) West Coast AAE exhibits more pitch fluctuation than East Coast AAE;
- (2) West Coast rap flows exhibit more pitch fluctuation than East Coast rap flows;
- (3) West Coast AAE exhibits more rhythmic variation than East Coast AAE;
and
- (4) West Coast rap flows exhibit more rhythmic variation than East Coast rap flows.

Implied by these four hypotheses is the article's fifth, overarching hypothesis that regional variation in rap flows follows a similar pattern as regional variation in speech prosody in the context of West Coast and East Coast AAE and rap.

The study's results support the first hypothesis, as West Coast AAE's average pitch fluctuation slope per every 10 ms was found to be significantly greater than East Coast AAE's. As was the case with speech, the average pitch fluctuation slope of West Coast rap flows was also found to be greater than that of East Coast rap flows. These findings do not support the second hypothesis, though, as only a marginal effect was observed. Closer examination of the data revealed that this insignificant result was the result of the pitch fluctuation exhibited by Kendrick Lamar, an outlier in the West Coast group displaying a substantially lower degree of pitch fluctuation. For this reason, another explorative statistical analysis was performed with Lamar's data excluded. Without Lamar's data included, West Coast rap flows were found to exhibit significantly greater levels of pitch fluctuation than East Coast rap flows. This suggests that it would be valuable to replicate the present

study in the future with a larger subject pool in order to see if West Coast rap flows are indeed marked by greater melodic variation than East Coast rap flows.

In terms of prosodic rhythm, rhythmic variation was examined along two parameters: nPVI scores (reflecting rhythmic variation along the stress-timed/syllable-timed continuum); and CV (reflecting variation across entire utterances). Regarding the former, it was found that West Coast AAE was characterized by significantly higher nPVI scores than East Coast AAE, meaning that West Coast AAE is markedly more stress-timed. In fact, no East Coast subject displayed a higher nPVI score than any single West Coast subject. In terms of variation across entire utterances, the results show that West Coast AAE speakers displayed significantly higher CV levels than East Coast AAE speakers, that is, displayed more rhythmic variation across whole utterances. Both the nPVI and CV findings therefore support the study's third hypothesis. Regarding rap flows, rhythmic variation was tested only in terms of note interval CV data. It was found that West Coast rap flows showed significantly higher CV values than East Coast rap flows. Hence, the findings support the fourth hypothesis as well. Interestingly, it was found that some of the regional variation is only explained by "speech rhythm nPVI" and not by "speech rhythm CV", whereas the opposite was not found to be the case. Future studies could investigate this further to gain a better understanding of how rhythmic variation in terms of nPVI and CV are related to each other.

In sum, hypotheses 1, 3, and 4 were all supported by significant results. This was not the case for hypothesis 2, however. Because visual inspection of Figure 3.4B revealed that one subject – Kendrick Lamar – behaved markedly different than the others, an explorative investigation was conducted in which Lamar's data point was excluded from analysis. It was found that, had Lamar's data point not been included, the difference between coasts would have been significant. Lamar's display of pitch fluctuation while rapping seemingly formed the exception to the rule, and it might be the case that Lamar's use of pitch highlights an artistic motivation that was not considered before the hypotheses were formed: while rappers are on the one hand encouraged by their environment to represent for their home region by using the flows typically associated with said region, they might also have an incentive to deviate from these norms in order to stand out amongst thousands of other aspiring rappers fighting for attention in the local, national, and international markets. As a result, somebody such as Kendrick Lamar, whose use of pitch in speech is similar to that of his West Coast peers, perhaps decided to do something completely different with his flow than his colleagues on the West (and even the East) Coast. It is worth mentioning here that Lamar actually displayed some

of the most rhythmic variation of all rappers analyzed in this study, so if he was indeed trying to stand out from the crowd with his rapping, he only did so in the domain of melody, not rhythm. Of course, this is all highly speculative, and further research needs to be conducted on West Coast rap flows in general and Kendrick Lamar's flow in particular to see if there is merit to this explanation of why Lamar deviated from his peers.

From these data, it can be concluded that West Coast AAE prosody and East Coast AAE prosody are distinct from each other for the domains of both rhythm and pitch, with West Coast AAE exhibiting more rhythmic and melodic variation. For rap flows, the same pattern of regional variation can be observed, although the differences are a little less clear-cut (see the discussion of Kendrick Lamar above). Hence, the findings support Kautny's (2015) idea that rap flows may be reflective of prosodic features. Moreover, the data suggest that Patel et al.'s (2006) findings that classical composers were influenced by their mother tongue's prosodic features may be extended to the domain of rap. These findings also suggest that this influence of prosody on music may be so strong that its effects cannot just be observed when comparing music from speakers of distinct languages, but of regional variants of the same language (variety) as well. More research needs to be conducted to verify these observations, however, and the present study should be seen as a starting point rather than an end station in this regard.

The present study found that the musical p.d. between the East Coast and the West Coast was roughly 55% the size of the linguistic p.d., a larger percentage than was found by Patel et al. (2006) for English and French speech and music (about 30%). This finding would suggest that music and speech are more similar to each other in the West Coast/East Coast AAE rap context than they are in the context of British English and French classical music and speech. Moreover, Patel et al. found that in their two-dimensional rhythm–melody space plot, “a line connecting English and French speech (...) would lie at a very similar angle to a line connecting English and French music” (2006, p. 3042), the difference between the prosody and music vectors being only 14.2°. From the present study's rhythm–melody space plot for East Coast and West Coast AAE speech and East and West Coast rap (Figure 3.8), a similar observation can be made, with an only slightly larger angle between the vectors for prosody and for rap, namely 20.2°. In light of the Patel et al. study, it is also noteworthy that on their rhythm–melody space plot with all the analyzed composers plotted individually, they found that the British and French groups hardly overlapped:

English and French occupy distinct regions of [the two-dimensional space of rhythm and melody], despite large variation along any single dimension (...). This suggests that the *joint* properties of melody and rhythm, not either one alone, are involved in defining national characteristics of music. (2006, p. 3042)

Correspondingly, the current study found similar results for West Coast AAE and East Coast AAE prosody (see Figure 3.9A) as well as West Coast and East Coast rap music (see Figure 3.9B). The fact that these findings on rhythm and melody corroborated the patterns observed by Patel et al. (2006) indicates that it will be worthwhile to further explore rhythm and melody as well as music and language together in future studies of prosody and music.

To conclude, this study found that West Coast AAE speech prosody is characterized by more rhythmic and more melodic variation than East Coast AAE speech prosody. Moreover, it was found that West Coast rap was marked by more rhythmic variation than East Coast rap, and while no statistically significant difference between the two regarding melodic variation was found, a trend towards more melodic variation on the West Coast was observed. The study's findings appear to suggest that in the context of West Coast and East Coast AAE and rap, variation in regional dialects and regional styles of music follow similar patterns and may be related to each other. From the findings, it also appears that the influence of sociolinguistic factors (in this case: expressing regional identity linguistically) may not be limited to the domain of language, but that it may cross over into the domain of music as well. Future studies should further explore this study's findings, for instance by also looking at other rappers from the East Coast and West Coast, or by looking at more pieces of music and instances of speech from the artists that were examined in the present study. Moreover, it would be very interesting to replicate the study for other regions of hip-hop as well, such as the Midwest (e.g., Chicago or Detroit) and the South (e.g., Atlanta and Houston) in order to get a better idea of regional variation in AAE prosody and rap flows across the United States. Furthermore, future studies could explore if and how the flows of rappers with different mother tongues differ from each other and if this reflects their native language's prosodic characteristics as well (i.e., explore Kautny's (2015) suggestion that, for instance, English and Spanish rap would be rhythmically different due to rhythmic differences between the English and Spanish language).

3.5 Appendix

Appendix Table 3.1. Information regarding the interviews selected for prosodic analysis.

Subject	Interview description	Source	Year
Daz Dillinger	Vlad TV interview	youtu.be/Tc_sjmgRgVA	2015
Dr. Dre	Rhyme & Reason documentary	youtu.be/DOsLMpphQ_M	1997
Ice Cube	Onrust (Dutch TV)	youtu.be/KqFcLBhYipM	1991
Kendrick Lamar	GQ	youtu.be/4lPD5PtqMiE	2016
Nipsey Hussle	Big Boy's Neighborhood	youtu.be/IE3rTji-54k	2015
Snoop Dogg	The Arsenio Hall Show	youtu.be/O24JLNincTM	1994
The Game	Big Boy's Neighborhood	youtu.be/6QqyrHZIbWc	2016
Warren G	Ebro in the Morning	youtu.be/0bIMD48aR0s	2015
50 Cent	MTV News interview	youtu.be/3eSpL-qqfok	2005
Biggie Smalls	Original source unknown	youtu.be/Lv8PdI477ks	1995
Fabulous	The Breakfast Club	youtu.be/qxjqtiQrjNk	2016
Jay-Z	The Fresh Air	npr.org/2017/06/16/533216823/ja-y-z-the-fresh-air-interview	2010
Mos Def	92 nd Street Y Plus	youtu.be/IkwIulMRlak	2014
Nas	BET Presents	youtu.be/2bCf-60IHMo	2003
Raekwon	Sway in the Morning	youtu.be/cxMOXK2vdI4	2015
Rakim	The Cipher Show	theciphershow.com/episode/65/	2014

***Regional African-American
English accent perception in a hip-
hop context**

* Co-authored by Kees de Bot and Wander Lowie.

4.1 Introduction

The present study is concerned with regional variation in African-American English (AAE) dialects – specifically regarding the language variety’s West Coast and East Coast dialects – in the context of hip-hop culture. While much more research is needed on this, sociolinguists’ knowledge of how these two regiolects’ accents are distinct from each other has increased significantly in recent years. Moreover, we now have a far greater understanding of how intertwined hip-hop culture and AAE – the dominant language variety of (American) hip-hop – are, and how AAE regiolectal differences can play a role in light of hip-hop culture’s extreme focus on regionality and authenticity. However, the great majority of this research has taken a speech production-centric approach to the differences between West Coast and East Coast AAE, meaning there is still a substantial gap in the literature. We do not have a clear idea of how well people can perceptually distinguish West Coast and East Coast AAE, nor do we know which of the regiolects’ distinct accent features stand out to listeners the most, as little to no perceptual research on the differences between West Coast and East Coast AAE has been conducted yet.

This article aims to shed light on how the West Coast and East Coast dialects of AAE are distinct from a perceptual perspective. We report on an accent perception study that involved participants listening to the speech of native AAE speakers from either the West Coast or the East Coast. To ensure that the findings of the study were compatible with previous studies on West Coast and East Coast AAE speech production in a hip-hop culture context, all of the speakers were prominent West Coast and East Coast hip-hop artists. The study’s primary aims were twofold: to quantitatively assess how perceptually distinct the two regiolects are (i.e., how well people can identify whether someone is a speaker of West Coast or of East Coast AAE), and to qualitatively assess which accent features are most salient to listeners when trying to identify whether an AAE speaker is from the West or from the East Coast. Secondary aims included finding out whether certain demographic features are linked with accent assessment accuracy, or whether the types of accent features individuals find most salient are linked with accent assessment accuracy. The ultimate goal was to connect this study’s findings to the results of previous speech production research on West Coast and East Coast AAE in a hip-hop context in the hope that the perceptual results of this study could be used to identify fruitful avenues for future studies on these varieties. This could include, for instance, variationist studies aimed at mapping in greater detail how the dialects are distinct, or a second dialect acquisition study focusing on accent features

that the participants of this study listed as being different for West Coast and East Coast AAE.

4.1.1 Regional AAE dialects and hip-hop

Few varieties of English have been studied as much as AAE, the social dialect of English spoken by African-Americans. Despite all this research, however, sociolinguists long erroneously believed that AAE exhibited no regional differences across the United States. This notion, which is now known as the “homogeneity myth” (Wolfram & Kohn, 2015), was dismissed when more recent studies revealed that there are in fact notable regional differences between varieties of AAE spoken across the United States (e.g., Alim, 2004, 2015; Blake & Shousterman, 2010; Blake, Shousterman, & Newlin-Lukowicz, 2015; Cutler, 2007, 2014; Gilbers et al., 2019a; Green, 2002; Morgan, 2001; Wolfram & Thomas, 2002; Wolfram, 2007), but the myth’s legacy is that today we still know very little about how exactly regional AAE dialects differ from each other.

One key aspect of dialectal differences in AAE that we *are* aware of is that these differences are greatly important to the dialects’ speakers, especially those involved with hip-hop culture. Hip-hop culture plays an important role in this respect due to its intricate relationship with regional dialects of AAE, the language variety primarily associated with hip-hop (Cutler, 2007; Morgan, 2001; Smitherman, 1997). Region and place are central to hip-hop culture and hip-hop aficionados’ sense of identity (Forman, 2002), and because of its competitive nature, hip-hop facilitates a strong sense of local pride (Hess, 2009; Morgan, 2001). Representing a region or city invokes a social experience shared with other hip-hop community members from those places, and usage of one’s regional AAE variety is one of the prime means of expressing regional hip-hop identity and affiliation. Crucially, members of the hip-hop community are aware of accent differences between regional dialects of AAE and actively make use of regional phonological features to ‘represent’ for their own region and to distinguish themselves from other regions’ hip-hop aficionados (Morgan, 2001).

4.1.1.1 West Coast and East Coast AAE

One effect of the homogeneity myth is that little research has been conducted on the differences between the West Coast and East Coast accents of AAE. Morgan (1993, 1998, 2001) reports that in West Coast AAE, intervocalic /t/ is flapped, whereas in East Coast AAE it is glottalized. Based on anecdotal evidence, Morgan (1993, 1998, 2001) and Cutler (2007, 2014) also report that the West Coast dialect is

characterized by longer vowels. This claim was confirmed quantitatively by Gilbers (2015) for /æ/ vowels followed by voiceless consonants or sonorant consonants. Regarding prosody, a speech production study by Gilbers et al. (2019a) found that West Coast AAE was marked by significantly more melodic variation than East Coast AAE. In other words, the West Coast accent exhibits greater levels of variability in terms of pitch fluctuation. Correspondingly, Gilbers et al. (2019a) also report that the West Coast AAE accent shows more rhythmic variability than East Coast AAE, meaning that West Coast AAE is closer to the stress-timed end of the stress-timed/syllable-timed continuum than East Coast AAE.

4.1.2 Introducing a perceptual dimension

Although the studies cited above have substantially expanded our knowledge of the differences between West Coast and East Coast AAE speech, none of them approach second dialect acquisition and AAE dialectology from a speech perception perspective. In this respect, the phenomenon of linguistic profiling comes into play: the idea that hearers can use speech to group speakers according to classes or categories (e.g., ethnicity, sex, sexual preference, native language background, etc.). This extends to listeners' ability to identify where someone is from, geographically speaking, based on the way that they speak.

A perceptual dimension adds to the existing literature for several reasons. For one, although individuals' regional origins can predict both how they pronounce sounds and how they perceive them to a certain extent (Ladefoged & Broadbent, 1957; Willis, 1972), a growing body of work suggests that there is no one-to-one relationship between speech production and perception (e.g., Drager, 2010; Evans & Iverson, 2007; Schmid, Gilbers, & Nota, 2014; Thomas, 2000). Another reason to study how different dialects are perceived (and how this differs for different groups) is to find out which phonetic cues listeners make use of when trying to assess where a speaker is from. For example, in an experiment by Clopper and Pisoni (2004), all participants were found to make use of the same small set of phonetic cues when trying to determine speakers' origins based on their accents (Drager, 2010). Therefore, while a speech production perspective could potentially reveal all subtle differences between different regional dialects, a speech perception perspective could identify which of these differences are actually salient to the dialects' speakers and to listeners who do not speak the dialect themselves: even non-native speakers unfamiliar with the other language variety can rate (foreign) accents (Major, 2007). Furthermore, considering how common issues in second language acquisition often stem from perception-related difficulties (i.e., learners

tend to have problems with producing features they are unable to perceive; Best, 1995; Flege, 1995), a perceptual dimension could prove fruitful for research on second dialect acquisition involving West Coast and East Coast AAE (see, for instance, Gilbers, 2018a): if we know which features are perceptually salient to listeners and which ones are not, this could potentially help us explain why, for instance, certain features are acquired sooner than others.

4.1.2.1 Previous research on AAE perceptual dialectology

While much perceptual research has been conducted on AAE, the vast majority of these studies have looked at AAE in relation to other varieties of English, often treating AAE as a monolith and not focusing on regional differences within AAE. Much of this has been research in the field of raciolinguistics (see Alim, Rickford & Ball, 2016), for instance the substantial body of work on racial linguistic profiling (e.g., Purnell, Idsardi, & Baugh, 1999), or recent work on perceived ethnicity of American politicians (such as former US President Barack Obama) based on their manner of speaking (e.g., Alim & Smitherman, 2012; Holliday & Jagers, 2015; Holliday & Villareal, 2018). To the best of our knowledge, only a single perceptual dialectology study has made regional variation within AAE its primary focus so far. Using a map-labeling task, Mitchell, Lesho and Walker (2017) investigated folk perception of AAE regional variation by asking 55 participants (mostly African-Americans from Columbus, Ohio) to identify distinct AAE dialect regions as well as note linguistic features they associated with these regions. They were also asked to note their attitudes to the different regiolects they identified. Mitchell et al. (2017) concluded that their participants were able to distinguish multiple dialect regions of AAE, consistently identifying distinct lexical, phonological, and morphosyntactic features that were specific to AAE. Considering the present study's focus on accent variation rather than lexical or morphosyntactic regiolectal differences, the phonological features listed by their participants are worthy of being listed here. Rhoticity (or the lack thereof) was mentioned 9 times by 5 out of the 55 participants as a regionally distinct feature, and the participants "most commonly described the Southern regions as non-rhotic, and never the West or New England" (p. 6). Five comments referred to the type of front vowel centralization discussed in Blake and Shousterman (2010), four of which referred to Southern areas and one to the East Coast. Participants noted final consonant deletion twice (once for Louisiana, once for an area roughly corresponding to the Tri-State Area), /ao/ monophthongization was mentioned twice (once for Houston, Texas, once for a larger region in the Midwest), and *th*-stopping was mentioned three times (once for an area including

Louisiana, Florida, Georgia and Tennessee, once for Michigan, and once for Louisiana and Mississippi). Moreover, in light of the present study's focus on West Coast and East Coast AAE, their findings that East Coast AAE speakers were described as "rude" and "aggressive" and Californian AAE speakers as "cool" and "laidback" are of particular interest (p. 13). Note that in Mitchell et al.'s (2017) study, participants were not exposed to any recordings of actual speech, however. In other words, their participants were never asked to identify where a particular speaker was from based on speech recordings. As such, their folk dialectological ideas were never directly put to the test during the study.

4.1.2.2 Methodological insights from other accent perception studies

Although to our knowledge, no West Coast AAE-versus-East Coast AAE accent perception studies have yet been conducted, previous findings and approaches with regards to foreign accent rating experiments (e.g., Schmid & Hopp, 2014), ethnolect assessment studies (e.g., Purnell, Idsardi, & Baugh, 1999), and other work on sociolinguistic perception (e.g., Preston, 1999; Williams, Garrett, & Coupland, 1999; Drager, 2010) provide relevant information for the setup of the present study. For instance, Purnell et al. (1999) argue that only "[v]ery little speech is required for dialect identification" (p. 28), with Schmid and Hopp (2014) adding to this that (foreign) accent rating accuracy increases to 89% when full phrases are presented, which usually results in speech excerpts of 10 to 20 seconds in length.³¹ Schmid and Hopp further note that these speech excerpts should contain extemporaneous speech, as this offers "the best basis for a comparison of accentedness" (p. 370). Moreover, they note that to quantify listeners' accent judgments, several studies have successfully made use of a two-alternative forced choice paradigm (Asher & García, 1969; Flege, 1984), often supplemented with confidence judgments (de Leeuw, Schmid, & Mennen, 2010; Hopp & Schmid, 2013; Schmid & Hopp, 2014) for accent perception experiments.

4.1.3 Aims and research questions

Seeing as this study is the first to look into listeners' ability to distinguish between West Coast and East Coast AAE in a hip-hop context, it is exploratory in nature. As

³¹ Schmid and Hopp also report there is no evidence that accent rating accuracy increases with speech excerpts longer than 20 seconds, noting that this might in fact negatively influence accuracy (2014, p. 370).

such, the study is not so much concerned with testing hypotheses as it is with collecting information that can be used to generate new hypotheses for future research.

First and foremost, we aim to find out whether US-based, English-speaking listeners of diverse backgrounds (in terms of regional origin, age, ethnicity, gender, whether they are native speakers of AAE or not, etc.) are actually able to perceptually distinguish between free speech recordings of West Coast AAE and East Coast AAE (as spoken by men professionally involved with hip-hop culture). We would expect a substantial portion of listeners to be able to do this on the basis of the existing literature on the West Coast and East Coast regiolects of AAE. For one, various studies reported differences between the two varieties both on a segmental level (e.g., Alim, 2004; Cutler, 2007, 2014; Morgan, 1993, 1998, 2001; Gilbers, 2015) and on a suprasegmental level (e.g., Gilbers et al., 2019a). Additionally, Morgan (2001) specifically claims that as a result of hip-hop's urban language ideology, an awareness of the importance of phonological differences between regional AAE dialects exists amongst African-Americans and people involved with hip-hop culture, and that they may even actively use this knowledge to "represent major cities and regions on the East and West Coasts" linguistically (p. 188). As mentioned earlier, however, quantitative support for these claims has not been provided yet. As such, the only hypothesis that will be tested directly in this study is the hypothesis that listeners are able to differentiate the two accents from each other.

Secondly, we aim to identify the stereotypes of West Coast and East Coast AAE accents (i.e., find out how people think these regional accents are distinct from each other), which (types of) accent features are most salient to them (i.e., which (types of) accent features are most commonly observed to be different for the two regiolects), and how this compares to the findings reported by Mitchell et al. (2017; see discussion in section 4.1.2.1 above). We also aim to find out whether listeners' ideas correspond to or deviate from the differences between West Coast and East Coast AAE reported in the literature (e.g., Morgan, 2001; Gilbers et al., 2019a).

Thirdly, we intend to find out whether listeners' accent assessment accuracy scores are related to certain demographic characteristics and the (types of) accent features they find most salient. For instance, we want to find out whether paying attention to, say, vowel quality differences is linked to higher accuracy scores, or whether a higher level of familiarity with AAE means a listener can be expected to better perceptually distinguish AAE regiolects. The eventual goal is that these investigations' findings can be used to generate specific hypotheses for future

studies, in which speech recordings can then be selectively manipulated (e.g., by artificially manipulating vowel formant values, the frequency and duration of pauses, or melodic characteristics of speech) to see how these factors affect listeners' AAE regional accent perception in an experimental setting (cf. prosody-focused raciolinguistic studies such as Holliday & Villareal, 2018). We also aim for our results to provide starting points for future variationist dialectology work on West Coast and East Coast AAE aiming to establishing in more detail how they are productionally different. Finally, we hope that our findings can be of aid in future second dialect acquisition research in the context of West Coast and East Coast AAE; knowing which features stand out to listeners the most could help explain why certain second dialect features are acquired later than others (if at all).

4.2 Method

This article is concerned with an accent perception study conducted by means of an online survey. The study comprised a background questionnaire, two rounds in which participants were asked to assess whether speakers were from the West Coast or the East Coast, and a post-study questionnaire in which participants were asked, among other things, what they thought the differences were between West Coast and East Coast AAE. The study's design as well as other methodological aspects of the study are discussed in detail below.

4.2.1 Stimuli

4.2.1.1 Speakers

Considering that in hip-hop culture, language is an especially important tool for expressing regional identity (Morgan, 1993, 1998, 2001) and considering that we aimed to connect the results of the present study to other studies on regional variation in AAE in a hip-hop context (e.g., Gilbers, 2018a; Gilbers et al., 2019a), it was decided that all speakers used for the study's stimuli had to be prominent figures in hip-hop culture and music. A total of 16 native speakers of either West Coast AAE or East Coast AAE were selected (8 per coast). To limit intracoastal variability, all speakers were from either the greater New York City metropolitan area or the greater Los Angeles metropolitan area, as these are the two dominant hubs for East and West Coast hip-hop respectively.³² All speakers were male

³² Throughout this article, we use the terms 'West Coast' and 'East Coast' despite the fact that our subjects are exclusively from (the greater metropolitan areas of) Los Angeles and New York City.

Table 4.1. Selected West Coast and East Coast AAE native speakers involved with hip-hop.

West Coast	East Coast
Daz Dillinger, DJ Quik, DJ Yella, MC Eiht, Nipsey Hussle, Schoolboy Q, Warren G, YG	Cam'Ron, Fabolous, Grandmaster Caz, Jim Jones, Memphis Bleek, Pete Rock, Rakim, Rev Run

because it was unclear beforehand how including other genders would affect the way listeners would respond to the anonymized portion of the study, which involved pitching up speakers' voices by 5 semitones, perhaps making them sound more feminine as a result (see section 4.2.1.2 for a discussion of the anonymization procedure), and because most of the existing literature on the differences between West Coast and East Coast AAE in a hip-hop context has focused on male speakers.³³ To arrive at our speaker selection, a similar approach to Gilbers et al.'s (2019a) was taken. *Ranker.com*'s "The best rappers from Los Angeles" and "The best New York rappers" lists were used as a starting point for artist selection, the rankings of which were decided through thousands of online votes. For each list, the researchers filtered out all artists that did not fit the study's demographic criteria (i.e., artists that were not male, African-American, or not originally from the area). Prior to the final speaker selection, recordings from the resulting shortlist (both anonymized and unedited) were presented to two people greatly familiar with American hip-hop culture and music to see if they were able to identify who the speakers were. Any speaker that was recognized in this pre-study was deemed ineligible for inclusion in the study's stimuli. This means that the voices of some of West Coast and East Coast hip-hop's most famous figures (e.g., Snoop Dogg, Kendrick Lamar, 50 Cent, and Jay-Z) could not be used for this study. Despite not being recognized in the pre-study, the 16 artists that ended up being selected have had considerable commercial and/or critical success, and can reasonably be considered hip-hop ambassadors for their respective regions as a result. Table 4.1 presents an overview of the 16 artists that were eventually selected.

The reason for this is that the terms 'West Coast' and 'East Coast' are usually used in a *totum pro parte* fashion, meaning they often refer to just New York City and Los Angeles hip-hop rather than the larger regions they are part of.

³³ It should be noted here that after the data for this study had been collected, Lassche (2020) performed a small study on regional AAE prosody differences regarding pitch for female rap artists, finding that despite some subtle differences, regional differences regarding prosodic pitch variability for female speakers were similar to the regional differences reported by Gilbers et al. (2019a) for male speakers.

4.2.1.2 Recordings

For each speaker, two excerpts of uninterrupted speech (10 to 15 seconds in length) were selected. None of these excerpts featured other voices than the speakers'. Since the recordings feature the speech of public figures involved with hip-hop, excerpts were presented to the participants first in an anonymized audio condition (pitch digitally increased by five semitones, while keeping the rate of speech intact) to substantially decrease the chance of our participants recognizing the speakers' identities. The second round of recordings featured audio that was not pitch-manipulated (different excerpts of the same speakers).³⁴ To avoid that participants would make use of any metalinguistic data to form their judgments, the researchers aimed at ensuring that the audio excerpts contained no semantic information that could give away a speaker's regional origin or other types of content that could give away regional origin, like regional slang expressions.³⁵ An overview of which interviews were used for our study is provided in Appendix Table 4.1.

4.2.2 Survey

The study was administered by means of an online survey hosted on Qualtrics. It consisted of a brief introduction, followed by four separate parts. Below, each part of the survey will be discussed in order of appearance.

4.2.2.1 Introduction

The survey started with a brief introduction, in which we explained to participants that they would be confronted with short audio clips featuring speech by African-American men from either the West Coast or the East Coast of the United States and that their responses would be used for scientific research. They were told that their task was to assess for each of the audio clips whether the speaker they heard was from the West Coast or from the East Coast based on how they speak, and that they would also be asked how certain they were of their assessments. Moreover, they were told that if anything about a specific recording stood out to them, they

³⁴ The motivation for not anonymizing all recordings was that the literature on speaker anonymization is unclear with regards to the effects of pitch manipulation on accent perception and phonetic accent markers in the speech signal. By manipulating only half of the recordings and exposing listeners to both anonymized and unaltered speech excerpts for all speakers, accent assessment scores could be compared for both conditions.

³⁵ As will be discussed in the Discussion section, the researchers did not completely succeed at ensuring that no metalinguistic information was available in the excerpts.

would be able to write a comment about this for each separate clip. Next, participants were informed that the survey would take roughly 20 minutes to complete,³⁶ and that it comprised a brief background questionnaire, two rounds of accent assessments (20 per round), and another brief questionnaire about the recordings they listened to. Finally, they were asked to make sure that they were able to hear a test audio file before starting the survey, as a significant part of the survey involved audio playback.

4.2.2.2 Background questionnaire

Participants were prompted to fill out an extensive background questionnaire as part of the study. This questionnaire included standard sociolinguistic demographic questions on the participants' age, gender, their place of birth, their current and prior places of residence (and duration of residence at each location), and the languages they spoke including self-estimated proficiency level (low proficiency, medium proficiency, high proficiency, or native speaker). As we were interested in finding out how listeners' experience with AAE could be related to their accuracy in perceptually distinguishing AAE regiolects from each other, participants were also asked whether they deemed themselves native speakers of AAE, and how familiar they were with AAE (on a 5-point Likert scale ranging from "not familiar at all" to "extremely familiar"). Before the AAE-related background questions, participants were presented with the following definition of AAE to ensure every participant had at least a basic grasp of what we mean by AAE:

African-American English is a language variety primarily used by many African-Americans and also some Black Canadians. It is the native language variety of most working- and middle-class African-Americans, and it is unique from other varieties of English in terms of grammar, vocabulary and pronunciation. Notably, not everybody who speaks African-American English is African-American (although many are), and similarly, not all African-Americans speak African-American English, or, if they do, speak it all the time. For example, former U.S. President Obama could regularly be heard switching from a standard American English accent to an African-American English accent when addressing African-American crowds.

³⁶ Several test runs indicated that the survey took about 15 to 20 minutes to complete.

Figure 4.1. Screenshot of how participants were asked to respond to each separate audio clip in the survey.

▶ 0:00 / 0:13

🔊

⋮

Please answer the following questions based on the recording above.

If you have any specific comments about this recording (for example regarding the speaker, topic of conversation, or language use), please write them down in the third column.

	Is this speaker from the West Coast or the East Coast of the United States?		How certain are you of your assessment?			Any specific comments about this recording? [Optional]
	West Coast	East Coast	Uncertain	Somewhat certain	Certain	Comment
Assessments	☐	☐	☐	☐	☐	<div></div>

Next

4.2.2.3 Block 1: anonymized speech excerpts

In the first block of audio clips, participants were presented with a total of 20 anonymized audio clips collected from the public domain: one clip for each of the 16 speakers listed in Table 4.1, and four audio clips from interviews with the rapper Tupac “2Pac” Shakur that were included in light of a separate second dialect acquisition study we will not further report on in the remainder of this article. The audio clips were presented in randomized order (although it was made impossible for two 2Pac recordings to be presented right after each other). Participants were not able to go back and change their answers after having proceeded to the next page here (or anywhere else in the survey).

Before being presented with the audio clips, participants were told that they would be listening to 20 recordings and be asked to assess for each speaker whether they thought they were from the West or the East Coast. They were also told that if something about a particular recording stood out to them (for instance, the topic of conversation, the language use of the speaker, the speaker himself, or anything else they thought might be of relevance to their assessment), they would have the opportunity to write a comment about this next to each of their assessments. Next, participants were presented with a separate page for each recording as presented in Figure 4.1. It was mandatory for participants to answer the questions regarding coast of origin and assessment certainty in order to proceed to the next question, while the comment box was optional.

4.2.2.4 Block 2: unedited speech excerpts

After finishing Block 1, Block 2 commenced immediately, and participants received the same instructions as they did at the start of the first block. In the second block of audio clips, participants were presented with a total of 20 unedited audio clips: one for each of the 16 speakers listed in Table 4.1, and four audio clips from interviews with 2Pac. As was the case for Block 1, the audio clips were presented in randomized order.

4.2.2.5 Post-study questionnaire

After finishing Block 2, the post-study questionnaire part of the survey commenced. First, participants were asked the following open question: “having listened to the recordings in this study, in what way(s) do you think the West Coast African-American English accent is different from the East Coast African-American English accent?” Subsequently, they were asked whether there were any accent features that they paid special attention to while trying to form their accent judgments throughout the study. This question could be answered with “no” or “yes, namely” followed by a comment box. After proceeding to the next page, participants were asked whether they had recognized any of the speakers in the first block of the survey. If they answered “yes”, they were asked an open follow-up question of who they thought they had recognized. Afterwards, the same question was asked for the second block. Next, they were asked to rate their familiarity with linguistics, with linguistic research on regional varieties of AAE, and with hip-hop music and/or culture on a 5-point Likert scale (ranging from “not familiar at all” to “extremely familiar”) as we were interested to see whether these factors were related to listeners’ performance on the perception task. They were given the option to elaborate on their self-assessed familiarity levels in comment boxes. Next, participants were thanked for their participation, and given the option to leave their email addresses if they wanted to have a chance at winning one of three \$25 Amazon vouchers and/or if they wanted to learn about the results of the study once these would be available. They were also asked if they took the survey for extra course credit, and, if so, to enter their Student ID numbers. Finally, they were shown how many of their 40 accent assessments had been accurate.

4.2.3 Participants

4.2.3.1 Recruitment

The study's 306 participants were recruited in several ways. Most participants were students at New York University (NYU) who took the "Black Language Matters" undergraduate course (Fall semester 2017-2018) or students at the University of California Los Angeles (UCLA) who took the "Culture and Communication" undergraduate course (Fall semester 2018-2019). These participants were offered extra course credit in exchange for taking the online survey. The second largest group of participants was recruited online via Reddit's r/SampleSize community, which allows researchers to find participants for their studies. Participants were required to be from the United States, but no other demographic criteria were set. All other participants were recruited in person or by word of mouth (e.g., by means of flyers advertising the study), for instance on NYU and UCLA's campuses, and during this article's primary author's academic lectures and popular science talks in Boston, Amherst, New York City, and Los Angeles. All participants were offered the chance to win one of three \$25 Amazon gift vouchers in exchange for taking the survey. As a result of how participants were recruited, the vast majority of them were young adults and university educated, many of them with an apparent interest in language and sociolinguistics (as they took language-related university courses).

4.2.3.2 Demographics

Excluding participants who did not complete the survey, a total of 306 participants were recruited for the study. Out of these 306, 71.90% were female ($N = 220$), 27.45% were male ($N = 84$), and 0.65% identified as neither (cis) male nor (cis) female ($N = 2$; one trans woman and one participant who identified as non-binary). Participants' ages ranged from 17 to 58 years old ($M = 20.85$, $SD = 5.52$). 10.78% ($N = 33$) of the participants considered themselves native speakers of AAE. 79.41% considered themselves native speakers of English, 10.78% considered their English proficiency to be high, 0.98% indicated their English was of medium proficiency, and the other participants neglected to specify their English proficiency level.³⁷ The participants' self-assessed familiarity levels with AAE, hip-hop, linguistics, and linguistic research on AAE regiolects are presented in Table 4.2. In the results and

³⁷ It should be noted here that the overwhelming majority of the participants who neglected to specify their English proficiency level were active university students in the United States, suggesting that they possessed high levels of English proficiency.

Table 4.2. Overview of participants' self-assessed familiarity levels with AAE, hip-hop, linguistics, and linguistic research on AAE regiolects (both absolute numbers and percentages).

	AAE	Hip-hop	Linguistics	AAE regiolects
<i>Not at all familiar</i>	19 (6.21%)	42 (13.73%)	34 (11.11%)	119 (38.89%)
<i>Slightly familiar</i>	78 (25.49%)	102 (33.33%)	125 (44.12%)	111 (36.27%)
<i>Moderately familiar</i>	125 (40.85%)	83 (27.12%)	112 (36.60%)	64 (20.92%)
<i>Very familiar</i>	58 (18.95%)	49 (16.01%)	18 (5.88%)	10 (3.27%)
<i>Extremely familiar</i>	26 (8.50%)	30 (9.80%)	7 (2.29%)	2 (0.65%)

discussion sections below, we will discuss how these are or are not related to accent assessment accuracy.

4.2.4 Data analysis

4.2.4.1 Accent assessment accuracy and confidence

Participants' accent judgments were twofold in the sense that they had to choose a coast as well as note how sure they were their assessment was correct. As such, their responses can be analyzed both in terms of accuracy (measured in percentages) and confidence (measured on a 3-point Likert scale). Accent assessment accuracy scores were statistically analyzed using one sample *t*-tests with a test value of 50 (i.e., performance at chance level). Accent assessment accuracy and accent assessment confidence scores from both rounds of the study were statistically compared to each other using paired samples *t*-tests in IBM SPSS Statistics 26.

4.2.4.1.1 Discarded accent assessments

When participants noted that they had made use of metalinguistic information to inform their accent judgments (i.e., when they recognized a speaker's identity, or when, despite the researchers' efforts, they figured out where a person was from based on the semantic content of a speech excerpt), the respective data points were discarded. Participants had two opportunities to comment on such instances: (1) alongside any of their individual accent judgments (see Figure 4.1), and (2) during the post-study questionnaire part of the survey when they were asked for each block whether they had recognized any of the speakers. Regarding the first, responses were discarded if they mentioned they had recognized a particular speaker's identity (regardless of whether the speaker they thought they had recognized was actually the speaker in the recording), or if they mentioned that what the speaker was talking

about gave away where he was from.³⁸ Regarding the second, the relevant responses were discarded when a participant had correctly identified a speaker in one or both of the survey's blocks. A total of 35 (out of 9792, so 0.36%) individual accent assessments were discarded this way (13 for the anonymized audio round and 22 for the unaltered audio round).

4.2.4.2 Qualitative descriptions of West Coast and East Coast AAE differences

As stated earlier, the qualitative portion of this study was exploratory in nature with the aim of generating hypotheses for future perceptual work on AAE regiolects. To this end, participants' responses to the open questions in the post-study questionnaire part of the survey were carefully dissected and categorized based on the (types of) accent features they listed as being particularly salient to them. It was also analyzed whether participants' responses matched or perhaps contradicted previous findings on the differences between West Coast and East Coast AAE speech.

Participants' responses were categorized in four major categories: 1) comments on suprasegmental accent features, 2) comments on segmental accent features, 3) comments on matters that were not related to speech but dealt with peripheral matters, and 4) comments in which the participant stated they had no or almost no idea of what the differences between West Coast and East Coast AAE could be. These major categories were further subdivided into subcategories (e.g., comments on rhythm, pitch, enunciation, etc.) encompassing a variety of features. Table 4.3 presents an overview of the categories we used for the analysis of the qualitative responses. Further on, in the results section, it will be discussed quantitatively how participants' comments were distributed along these (sub)categories.

For each participant, we counted how many (sub)categories they commented on *at least once*, meaning that participants' responses were counted per (sub)category in a binary fashion: 'yes' or 'no'. As such, if one participant commented on differences in tempo, stress patterns, and degrees of rhythmic variation between the two regiolects, and another participant commented only on tempo differences, both participants would receive a single check mark for the

³⁸ For example, one audio clip featured a speaker talking about his basement. This information helped several of our participants figure out that the person was likely from the East Coast, since houses on the West Coast typically do not have basements, a detail that the researchers had missed while designing the study.

Table 4.3. Categorization of the accent features for which participants thought the West Coast and East Coast AAE accents are distinct and/or what they paid attention to when trying to form their accent judgments.

Main category	Subcategory	Examples of comments
Suprasegmental	Rhythm	<i>Rhythmic variation, stress patterns, tempo</i>
	Pitch	<i>Average pitch levels (e.g., ‘depth of voice’), pitch range/variability, pitch inflection, tone</i>
	Miscellaneous	<i>Nasality, amplitude/loudness, style (e.g., ‘laidback speech’, ‘surfer dude style’)</i>
Segmental	Consonants	<i>Rhoticity, realization of liquids, harshness/softness of pronunciation, velar vs. alveolar nasal in final position (‘-ing’ vs. ‘-in’), interdental vs. labiodental fricative in intervocalic contexts (e.g., ‘mo<u>th</u>a’ vs. ‘mu<u>v</u>a’), cluster reduction</i>
	Vowels	<i>Vowel quality, vowel duration</i>
	Enunciation	<i>Enunciation, slurring, mumbling, word-final elisions</i>
	Miscellaneous	<i>Non-specific comments on how the regiolects are marked by a different pronunciation</i>
Not accent-related	Lexicon	<i>Comments on regional slang, usage of filler words such as ‘like’</i>
	Familiarity with regiolect	<i>Judgments based on a participant’s familiarity with one of the two accents (i.e., anything that sounded unfamiliar was judged as being the ‘other’ regiolect)</i>
	Conversational topics	<i>Associating certain topics more with a particular region</i>
	Miscellaneous	<i>Syntactic features (e.g., degree of copula deletion)</i>
No idea	Miscellaneous	<i>Participants noting they had little to no idea what the differences between the regional accents could be</i>

rhythm subcategory rather than the former participant receiving three check marks and the latter just one. This decision was made because there were substantial differences in how our participants described the accent features they observed. To illustrate, some participants simply commented that vowels were pronounced differently in the two regiolects, whereas others noted East Coasters’ higher degree of monophthongization of diphthongs, a difference regarding the vowel sound in the COT-CAUGHT merger, and a regional difference in the pronunciation of ‘OR’, ‘IR’, and ‘O’ sounds. The diverse nature of our participants’ comments in terms of jargon usage and specificity made it difficult (if not impossible) to accurately and fairly assess how many individual features they actually addressed within a particular subcategory, which is why we opted for a binary coding system. Of course, it was possible (and common) that participants commented on multiple

(sub)categories. Even the ones that noted they had no or almost no idea what the differences could be sometimes still made (educated) guesses of what the differences might be, and these responses were also included in our analyses.³⁹

4.2.4.2.1 Relations between reported accent differences and accuracy

Aside from classifying participants' reported differences between West and East Coast AAE, we also looked to see whether people who reported certain types of regiolect differences performed better (or worse) in terms of accent assessment accuracy. These investigations were performed using independent samples *t*-tests and multivariate general linear models in IBM SPSS Statistics 26.

4.3 Results

4.3.1 Accent assessment accuracy and confidence

A one-sample *t*-test with a test value of 50 (i.e., performance at chance level) was performed to see whether the participants of the study were able to correctly assess whether speakers were from the West Coast or the East Coast better than chance. Regarding the first, anonymized audio round, it was found that the study's participants, on average, performed significantly better than chance ($M = 51.552$, $SD = 12.478$), $t(305) = 2.176$, $p = .030$, $d = 0.124$. For the second, unaltered audio round, the participants also performed better than chance on average ($M = 53.835$, $SD = 13.427$), $t(305) = 4.996$, $p < .001$, $d = 0.286$. When analyzing both rounds together, on average, participants also significantly performed better than chance level in terms of accuracy ($M = 52.683$, $SD = 9.591$), $t(305) = 4.893$, $p < .001$, $d = 0.280$. Moreover, a paired samples *t*-test revealed that participants were significantly more accurate in the unaltered audio condition ($M = 53.835$, $SD = 13.427$) than in the first, anonymized audio condition ($M = 51.552$, $SD = 12.478$), $t(305) = 2.295$, $p = .022$, $d = 0.131$. Figure 4.2 provides an overview of the accuracy distributions for each round separately as well as for the two rounds combined.

³⁹ The response counts of the 'not accent-related' category were not tracked individually for each of its subcategories listed in Table 4.3, as the present study is exclusively concerned with the differences between West Coast and East Coast AAE speech.

Figure 4.2. Distribution of accuracy scores (percentages) for both rounds; separate and combined.

4.3.1.1 Relationships between selected demographics and accuracy

An independent samples *t*-test revealed that overall, AAE native speakers' accent assessments were, on average, significantly more accurate ($M = 57.625$, $SD = 9.904$) than those of participants who did not consider themselves (native) speakers of AAE ($M = 52.085$, $SD = 9.396$), $t(304) = 3.180$, $p = .002$, $d = 0.574$. When analyzing the anonymized and unaltered rounds separately, a similar significant difference was only found for the latter, with AAE native speakers being more accurate ($M = 62.921$, $SD = 15.514$) than non-native speakers of AAE ($M = 52.737$, $SD = 12.752$), $t(304) = 4.228$, $p < .001$, $d = 0.717$. Moreover, linear regressions were performed for both rounds separately and together with accent assessment accuracy as the dependent variable and familiarity with AAE, AAE dialectology, hip-hop, and linguistics as the independent variables, but no significant relationships between these were brought to light this way.

Table 4.4. Overview of how many participants remarked on a particular category or subcategory of accent features at least once (both absolute numbers and percentages).

Suprasegmental	139 (45.42%)
<i>Rhythm</i>	71 (23.20%)
<i>Pitch</i>	64 (20.91%)
<i>Miscellaneous</i>	51 (16.67%)
Segmental	158 (51.63%)
<i>Consonants</i>	42 (13.73%)
<i>Vowels</i>	54 (17.65%)
<i>Enunciation</i>	47 (15.36%)
<i>Miscellaneous</i>	60 (19.61%)
Not accent-related	136 (44.44%)
No idea	61 (19.93%)

4.3.2 Qualitative descriptions of West Coast and East Coast AAE differences

Table 4.4⁴⁰ presents an overview of participants' responses – divided over the four major categories and their respective subcategories – to what they thought the differences between West Coast and East Coast AAE were and/or which accent features in particular (if any) they were listening for to form their judgments.⁴¹ In the following subsections, we will discuss participants' responses in detail for the suprasegmental and segmental categories.

4.3.2.1 Suprasegmental accent features

As can be seen from Table 4.4, 45.42% of our 306 participants ($N = 139$) noted at least one suprasegmental accent feature as being different for West Coast and East Coast AAE. 71 of these people commented on rhythm-related accent features, 64 on pitch-related features, and 51 of them commented on other types of suprasegmental features. Table 4.5 provides examples of frequently mentioned comments on suprasegmental features, divided over the three subcategories.

⁴⁰ Note that participants could (and often did) comment on multiple (sub)types of accent features, which is why the percentages in Table 4.4 do not add up to 100%.

⁴¹ Since it was difficult to separate participants' responses to these questions (oftentimes, participants referred back to their comments on the differences between the two regiolects in response to the question which accent features they were listening for, for example), the answers to these two questions have been analyzed together.

Table 4.5. Examples of participants' comments related to suprasegmental accent features.

Suprasegmental	
<i>Rhythm</i>	<ul style="list-style-type: none"> - "East Coast AAE seems a little faster than West Coast AAE." - "I think the West Coast AAE accent is slower [with] longer pauses between words, [and] the East Coast AAE accent is more rhythmic." - "East Coast AAE is sometimes rhythmic [with a] more staccato pronunciation." - "Especially when they get passionate about a topic, the sounds of East Coasters' words begin to flow in a way that sounds like poetry, meaning they speak with rhythm. It's not like rapping or freestyling but like slam poetry."
<i>Pitch</i>	<ul style="list-style-type: none"> - "West Coast AAE seems to be lower in tone." - "The West Coast accent is more melodic than the East Coast accent." - "There is a difference in tone." - "The East Coast accent is a bit deeper and monotone." - "For some reason, I affiliate deep voices and monotone ones with the West Coast AAE accent."
<i>Miscellaneous</i>	<ul style="list-style-type: none"> - "I think the West Coast accent is more nasal." - "West Coast AAE is marked by a small amount of vocal fry connecting words and overall a more relaxed way of speaking." - "The East Coast speakers project their voices very loudly." - "For West Coast AAE speakers, I think they (...) have a little twang at the end of their sentences. It's hard to describe what I mean by 'twang', but it's like a slightly longer-held note at the end (like at the end of Korean sentences with vowels)." - "I think that East Coast AAE is more expressive, loud, and fast, while West Coast is more relaxed and slow."

4.3.2.2 Segmental accent features

Table 4.4 shows that 51.63% of our 306 participants ($N = 158$) noted at least one segmental accent feature as being different for the West Coast and East Coast. 42 of these participants commented on consonant-related differences, 54 on differences in terms of vowels, 47 remarked the West Coast and East Coast AAE regiolects differed in terms of enunciation, and 60 listed other types of differences on a segmental level. Table 4.6 lists examples of recurring comments on segmental features, divided over the four subcategories listed above.

Table 4.6. Examples of participants' comments related to segmental accent features.

Segmental	
<i>Consonants</i>	<ul style="list-style-type: none"> - "People from the East Coast seem to be more 'R'-full when they speak." - "West Coast AAE has less consonant cluster reduction and less absence of 'R'-sounds." - "I think the West Coast accent has a little more emphasis on 'L'-sounds." - "There is a greater difference between the pronunciation of '-ing'. On the West Coast, '-ing' is more clear, while on the East Coast it sounds more like '-in'."
<i>Vowels</i>	<ul style="list-style-type: none"> - "I feel like the vowels on the East Coast have more of an open mouth, soft kind of sound." - "West Coast AAE has rounder vowel sounds." - "East Coast AAE has that New York kind of accent (i.e., how they pronounce their 'A'-sounds)." - "West Coast AAE speakers exaggerate their vowels." - "East Coasters seem to hold some vowels longer." - "Shorter vowels for West Coast AAE."
<i>Enunciation</i>	<ul style="list-style-type: none"> - "I associate the West Coast accent with words being more slurred together." - "East Coast AAE has differently pronounced 'A's in my opinion; West Coast 'A's are much softer." - "I think East Coast AAE speakers tend to have a more mumbling, word-blending way of speaking." - "East Coast AAE (...) was more likely to slur words, such that 'with you' sounded like 'wichu'."
<i>Miscellaneous</i>	<ul style="list-style-type: none"> - "West Coast AAE uses (...) more dragged out phonetics." - "East Coast AAE has a more aggressive, sharp pronunciation and accent of words."

4.3.2.3 Assessment accuracy in relation to reported accent features

Using a multivariate general linear model, we investigated participants' accent assessment accuracy scores in both the anonymized and unaltered audio rounds in relation to the (sub)types of accent features they reported to be different for West Coast and East Coast AAE. The intent here was to see whether the types of accent features someone finds most notable (at least notable enough to mention in our post-study questionnaire) was possibly linked to assessment accuracy.

First, a multivariate analysis was run for accent assessment accuracy in relation to the four main categories of reported dialect features: suprasegmental differences, segmental differences, miscellaneous differences, and the fourth category of 'no

idea'. A significant effect was found for the segmental category with participants noting differences of this type performing better ($M = 53.788$, $SD = 9.640$) than participants who did not ($M = 51.503$, $SD = 9.428$), $F = 4.426$, $p = .012$, $\eta^2 = .029$. No significant results were found for any other main categories of accent differences. Next, zooming in on the segmental category, a multivariate analysis was run on the segmental subcategories – consonant-related differences, vowel-related differences, enunciation-related differences, and miscellaneous segmental differences – to see which subcategory or subcategories had contributed to the previously reported result. It was found that the only subcategory that was significantly linked to a difference in accent assessment accuracy was the consonantal one, with participants who mentioned at least one consonantal difference between West and East Coast AAE performing better ($M = 58.618$, $SD = 11.067$) than those who did not remark on any consonantal differences ($M = 51.739$, $SD = 9.003$), $F = 10.074$, $p < .001$, $\eta^2 = .063$.

4.4 Discussion

4.4.1 Results

4.4.1.1 Accent assessment accuracy and confidence

This study's primary aim was to learn whether English-speaking listeners based in the United States are capable of perceptually distinguishing between the West Coast and East Coast accents of AAE (in a hip-hop context), something which has been claimed before in the literature (e.g., Morgan, 1993, 1998, 2001) but had never been quantitatively examined yet up until now. The study's results showed that, indeed, listeners are able to perceptually distinguish the two accents, as our participants significantly performed better than chance in terms of accent assessment accuracy for the anonymized audio round, the unaltered audio round, and when analyzing both rounds together. However, when interpreting these significant results, it is important to keep in mind that the respective effect sizes were all relatively small, suggesting only marginal effects. Moreover, it should be noted here that on a group level, our participants performed only marginally better than chance level (only a few percentage points higher than chance level), with many people having accuracy scores far below the 50% mark. This suggests many participants simply had no idea what the differences between the two regiolects were. This is supported by our participants' average accent assessment confidence score, which was found to be just below the intermediate score of "somewhat certain". Interestingly, the data appear to indicate that a substantial number of people were not simply guessing, but

actually based their judgments on inaccurate ideas of the differences between West Coast and East Coast AAE, something which is supported by some of the comments made by participants in the post-study questionnaire (see section 4.4.1.2 below for a detailed discussion of this), and which reinforces the idea that oftentimes, folk (socio)linguistic notions are not grounded in reality. We also found that native speakers of AAE were significantly better at identifying which coast a speaker was from than listeners who did not consider themselves (native) speakers of AAE, with a Cohen's *d* value suggesting a medium-sized effect. This is of course not a very surprising finding, but it does provide additional context for why the regional homogeneity myth persisted for so long, seeing as for the longest time, most researchers studying AAE did not speak the language themselves. It also supports the claims by Morgan (1993, 1998, 2001) that African-Americans are highly attuned to regional accent differences of AAE, although no support was found that suggests increased familiarity with hip-hop culture is related to higher accent assessment accuracy in this context.

4.4.1.2 Qualitative descriptions of West Coast and East Coast AAE differences

As can be observed from Table 4.4, the most frequently reported accent differences between West Coast and East Coast AAE were rhythmic in nature (reported at least once by 23.20% of our participants), closely followed by accent differences involving pitch or tone (reported at least once by 20.91% of our participants). This would suggest that prosodic characteristics are particularly salient to many listeners. However, when looking at the suprasegmental and segmental categories of accent features as a whole, we see that with 51.63%, more than half of our participants noted at least one segmental difference between West Coast and East Coast AAE compared to 45.42% of our participants noting at least one suprasegmental difference.

Interestingly, while combing through our participants' comments, we came across countless instances where participants were in disagreement with each other on how the two dialects differ regarding a certain accent variable. For instance, some participants claimed that West Coasters enunciate better than East Coasters, whereas others believed it to be the other way around. They also disagree about whether West Coast AAE or East Coast AAE is the more melodically variable variety of the two, the former of the two arguments being supported by Gilbers et al. (2019a)'s findings. Moreover, even when the participants themselves seem in agreement on how West Coast and East Coast AAE are distinct regarding a particular accent

feature, they sometimes went against what has been reported in the literature. For instance, all participants who commented on vowel duration remarked that East Coast AAE was characterized by longer vowels than West Coast AAE, even though several studies (e.g., Morgan, 1993, 1998, 2001; Gilbers, 2015, 2018a) have reported the opposite. As theorized in section 4.4.1.1 above, having inaccurate ideas on regiolectal differences would explain why some of our participants performed so far below chance level, as someone without any idea of what the regiolectal differences could be would actually have higher accuracy scores than someone who is confident but misinformed about how the accents differ.

Comparing the accent differences that our participants reported to those reported in Mitchell et al. (2017), we see some interesting differences. For one, their participants almost exclusively commented on segmental dialect features, whereas roughly 45% of our participants made at least one comment about a suprasegmental regiolectal difference (for West Coast and East Coast AAE, the only reported suprasegmental difference reported by their participants would have been classified as a miscellaneous suprasegmental feature in our study, namely that East Coasters sounded rude and aggressive whereas West Coasters sounded cool and laidback). One potential explanation for this difference between our studies could be that our participants were exposed to actual speech recordings before writing down their folk linguistic ideas, whereas their participants were not. Perhaps, suprasegmental features are more salient in listeners' minds only when they have just been confronted with them in actual speech, whereas the salience of segmental features is not characterized by such a recency effect. This is all highly speculative, however, and future research is required to see if there is any actual merit in this explanation.

The folk linguistic comments made by our participants provide many potentially fruitful avenues for future dialectological research dealing with speech production. As stated earlier, only very little research has been performed on productional differences between the West Coast and East Coast accents of AAE, most of which has focused on differences in vowel duration and prosody. However, our participants noted several other differences between the two dialects of a different nature, and future studies should pursue these suggestions to see if their folk linguistic attitudes were grounded in reality or whether they potentially contradict reality. Moreover, based on the different distributions of the accent feature (sub)categories, hypotheses can be generated for future (case) studies on (diachronic) second dialect acquisition in a West Coast/East Coast AAE context. For instance, one could investigate whether features that were reported relatively infrequently in our study also tend to be acquired later (or not at all) by second

dialect acquirers and, vice versa, whether apparently salient dialect features tend to be acquired sooner.

4.4.1.3 Accuracy in relation to reported accent differences

The data reported on in section 4.3.2.3 revealed that people who had made remarks on suprasegmental features were not significantly more accurate than people who had not reported on suprasegmental features. In contrast, people who had mentioned segmental features as being different for West Coast and East Coast AAE were significantly more accurate than people who had not. Mentioning consonantal differences appears to be key here, as people who reported on vocalic differences or enunciation differences between West Coast and East Coast AAE were not significantly more accurate than people who did not comment on those. Future studies could perhaps use these findings as starting points for experiments aimed at figuring out why, say, prosodic and vocalic differences are possibly less reliable to base one's accent assessments on than consonantal differences, even though they are among the most salient accent features for West Coast and East Coast AAE according to our participants. Such future studies should, however, take into consideration that we only observed marginal effects in our study, seeing as the effect sizes for our significant findings were all relatively small.

4.4.2 Methodological considerations

In section 4.1.3, it was stipulated that at the outset of this project, our primary aim was finding out whether US-based, English-speaking listeners of diverse backgrounds (i.e., diverse with regards to matters such as regional origin, age, ethnic background, gender, etc.) were able to perceptually distinguish between speakers (professionally involved with hip-hop culture) of West Coast and East Coast AAE on the basis of their speech. In practice, while our group of participants can be considered diverse in terms of some of these, we would be remiss to say that this means our subject pool was entirely representative. For one, the vast majority of our participants were university students in young or early adulthood, something which is reflected by the participants' mean age being just 20.9 years old. Moreover, most of these participants were women; although we have no reason to believe a listener's gender would affect their accent assessment accuracy scores, we definitely cannot claim our subject pool to be representative of society as a whole in that sense. Nevertheless, the fact that roughly 10 percent of our participants considered themselves native speakers of AAE – a percentage that roughly approximates the percentage of American citizens considered African-American – does bode well for

the sample's representativeness. We would, however, be interested to see future studies investigating AAE regiolect perception with only listeners that are native speakers of AAE.

Methodologically speaking, one of the greatest strengths of the study's design can also be considered one of its limitations: the fact that we used extemporaneous speech recordings. On the one hand, this means that we exposed our participants to authentic, real-world speech by native speakers deeply involved with hip-hop culture rather than to speech recorded in a laboratory setting, and that we were able to observe participants' responses to actual speech. Schmid and Hopp (2014) supports this choice, as they advocated for the use of extemporaneous speech for an accent perception experiment. On the other hand, doing so meant that we were unable to control for many potentially relevant factors. While we attempted to control for matters such as regional slang and extralinguistic information that could give away a speaker's coast of origin, we were unable to control for matters such as interlocutor effects (as we used pre-existing materials). Furthermore, our attempts at controlling for extralinguistic information were only partially successful, with a reference to an East Coast speaker's basement slipping through the cracks because we failed to realize in time that houses on the West Coast typically do not have basements. As a result of this, we were unfortunately forced to discard several data points. Moreover, we could not (and, as such, made no attempt to) control for the types of accent features exhibited in the recordings. While cues on suprasegmental characteristics and matters such as enunciation were available in any speech recording – a free speech excerpt will always contain rhythmic, melodic, and tonal information, for instance – specific consonantal and vocalic accent features do not always occur in each excerpt: it is quite difficult to base one's accent assessment on a speaker's degree of rhoticity when their speech excerpt does not contain any words with postvocalic /r/. However, as this study was so explorative in nature, we do not necessarily consider this a problem, but would like to see future experimental studies that carefully control for the presence or absence of certain accent features.

One aspect of our approach that warrants some evaluation is the way we anonymized our speakers. As described earlier, speakers' voices were pitched up by 5 semitones while keeping the excerpt's tempo intact. As such, the only accent features affected by this anonymization process were speakers' average pitch levels (i.e., the depth of speakers' voices) and possibly tone, while features such as melodic range and other pitch-related features remained intact. While our participants performed better than chance in both the anonymized and the unaltered audio round regarding accent assessment accuracy, a paired samples *t*-test showed that they

performed better in the unaltered audio round than in the anonymized audio round. This could be due to the fact that some listeners used average pitch levels as an auditory cue of where a speaker was from (some participants indeed listed voice depth and average pitch levels as features for which West Coast and East Coast AAE are distinct). However, it could also simply be the result of a learning effect: the unaltered audio round came second, and by the time participants commenced with that portion of the study, they had already gone through 20 speech excerpts. As we cannot conclusively state what the reason for this difference between performance in the anonymized and unaltered audio rounds is as of yet, we recommend a future study in which pitch is experimentally manipulated to see how pitching up vocals can affect accent perception.

4.4.3 Conclusion

To conclude, this AAE accent perception study aimed to find out whether English-speaking, US-based listeners from diverse backgrounds would be able to identify whether a speaker of AAE involved with hip-hop culture was from the West or the East Coast on the basis of their accent alone. Our findings confirm this to be the case, as our participants performed significantly better than chance level, thus confirming previous claims in the literature on West Coast and East Coast AAE regiolect perception in a hip-hop context. However, as the study was exploratory in nature, its main goal was not to test hypotheses, but rather to generate new hypotheses that can be tested in future, more experimental studies. We would argue the study has succeeded in this regard, as the findings of the study shed light on how people think the West Coast and East Coast AAE accents are distinct from each other, how the accent features people find most salient are related to their accent assessment accuracy, and how certain demographic characteristics are related to all of this. As such, the study offers starting points for a multitude of future projects – for instance projects focused on mapping how these dialects are different from each other in terms of speech production, projects investigating how accent feature perception plays a role in second dialect acquisition, or studies looking into why certain groups of people find different types of accent features to be more salient than others – that can hopefully expand our understanding of how people perceive the differences between West Coast and East Coast AAE and perhaps even regional accents in general.

4.5 Acknowledgments

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4.6 Appendix

Appendix Table 4.1. Overview of the interview recordings that were used to create the study's stimuli.

Subject	Interview description	Source	Year
Daz Dillinger	Vlad TV	youtu.be/Tc_sjmgRgVA	2015
DJ Quik	Big Boy TV	youtu.be/qGAjlm9qGK8	2015
DJ Yella	Vlad TV	youtu.be/LdO7SJ5VGoQ	2015
MC Eiht	Vlad TV	youtu.be/I-cMd50Ha0E	2016
Nipsey Hussle	Big Boy TV	youtu.be/IE3rTji-54k	2015
Schoolboy Q	Ebro in the Morning	youtu.be/ulg6l4KGrfA	2016
Warren G	Ebro in the Morning	youtu.be/0blMD48aR0s	2015
YG	Shay Diddy TV	youtu.be/ISOJMaX2xK4	2016
Cam'Ron	The Angie Martinez Show	youtu.be/ZtpdXSPhejA	2016
Fabulous	The Breakfast Club	youtu.be/qxjqtiQrjNk	2016
Grandmaster Caz	Vlad TV	youtu.be/jf4BgLZkE_A	2015
Jim Jones	The Breakfast Club	youtu.be/8mf9kfeYBI8	2016
Memphis Bleek	The Premium Pete Show	youtu.be/5_XHxM-3rqY	2017
Pete Rock	The Combat Jack Show	youtu.be/ku_feyHwxlQ	2014
Rakim	The Cipher Show	theciphershow.com/episode/65	2014
Rev Run	DJ Enuff	youtu.be/WVO_-DfPQPcY	2014

**How 2Pac's prosody and rap flows
changed: A case study on
linguistic and musical second
dialect acquisition**

5.1 Introduction

For decades, sociolinguists believed African-American English (AAE) to be a regionally homogeneous language variety. This idea was later challenged and dismissed by, for example, Wolfram (2007) and Wolfram & Kohn (2015), as recent work has clearly shown that AAE exhibits regional variation across the United States in a variety of ways, pronunciation being one of them (e.g., Morgan, 1993, 1998, 2001, 2002; Gilbers, 2018a; Gilbers et al., 2019a; Jones, 2020). However, speakers of AAE have always been aware of AAE's regional accent differences, especially the ones involved with hip-hop culture. This is because in hip-hop culture, regional affiliation plays a key role: members of the hip-hop community's sense of personal identity is often closely linked to the neighborhood, city, or larger region they are from, and it is common practice for hip-hop aficionados to express regional affiliation, actively "representing" for the place they are from (Alim, 2004; Forman, 2000, 2002; Gilbers, 2018a; Gilbers et al., 2019a; Morgan, 2001, 2002). Members of the hip-hop community that make rap music themselves have an extra tool on their belt to represent for their region: their style of rapping. Different regions' rap performances are often characterized by distinct styles or "flows" (i.e., a rap performance's melodic and rhythmic aspects), and rappers consciously use regional flows to represent the place they call home (Alim, 2004; Forman, 2000, 2002).

The concept of flow is reminiscent of the linguistic concept of prosody: both deal with the rhythmic and melodic (i.e., intonational) aspects of their respective domains (rap and speech). This observation, as well as previous research on a link between speech and music (e.g., Patel et al., 2006), led Gilbers et al. (2019a) to investigate whether a link between regional variation in AAE speech prosody and regional variation in rap flows existed for the West Coast and the East Coast of the United States, two hip-hop regions that historically have been at odds with each other, most notably in the mid-1990s when the rivalry between the West and the East Coast culminated in a heated conflict that involved several aggressive 'diss tracks' and even some violent incidents (Forman, 2002; Gilbers, 2018a; Hess, 2009; Morgan, 2001, 2002). Gilbers et al.'s (2019a) results indicated that regarding both rhythm and melody, West and East Coast rap flows differed from each other in a way that paralleled how West and East Coast AAE speech prosody differed from each other: higher levels of rhythmic and melodic variability on the West Coast than on the East Coast for both speech and rap. As such, Gilbers et al.'s (2019a) findings suggested that regional variation in language and music are connected to each other in an AAE/hip-hop context.

Given that regional identity and affiliation are highly important in hip-hop culture, that West and East Coast rap flows differ from each other in a way that parallels how West and East Coast AAE prosody differ from each other regarding rhythm and pitch, and that these regional differences are an important means of expressing one's regional hip-hop identity, we ask the following question in this article: what would happen to the speech *and* rapping style of a prominent African-American hip-hop artist who moved from one hip-hop region to another, changing their regional allegiance in the process? As such, this study is concerned both with the acquisition of a second *linguistic* regional dialect and with the acquisition of a second *musical* regional dialect in the context of AAE and hip-hop culture's territorialism. To this end, we conducted a case study which closely examines how the language and music of Tupac "2Pac" Shakur – arguably one of hip-hop's most successful and controversial figures ever – developed over time in light of the events that transpired during his life. This case study, which continues the line of inquiry of a previous 2Pac case study reported in Gilbers (2015) and Gilbers (2018a), is highly interdisciplinary in nature and builds on work from a wide variety of fields: from second language/dialect acquisition research to musicology, and from variationist sociophonetics to hip-hop studies and research on the language-music connection. In the subsections below, we will discuss each of these dimensions as they relate to our study in more detail and show how, together, they inform our main research question and hypotheses. We will also provide a detailed discussion of 2Pac and how his life story makes him an optimal subject for a case study designed to answer this research question.

5.1.1 AAE prosody and regional variation

Despite the fact that AAE is one of the most intensively studied language varieties in sociolinguistics, very little research exists on AAE prosody (Thomas & Carter, 2006; Thomas, 2015). Of this research, the vast majority has compared the prosodic characteristics of AAE to those of other language varieties, such as Standard American English or earlier versions of AAE. Thomas and Carter (2006) conducted the main study on AAE prosodic rhythm. They found that African-American North Carolinians' speech was highly stress-timed in nature (i.e., their unstressed syllables were considerably shorter than their stressed syllables) as was the speech of European-Americans from North Carolina. They also found that AAE had become more stress-timed compared to the AAE spoken by African-Americans born in the mid-19th century (i.e., stressed and unstressed syllables used to be more similar in length). With regards to prosodic melody, AAE's pitch range in free speech has

been found to be greater than that of European-American English speakers (e.g., Hudson & Holbrook, 1981, 1982; Jun & Foreman, 1996; Loman, 1975; Tarone, 1973) but smaller in read speech (e.g., Cole et al., 2005; Goodwin, Goodwin, & Yaeger-Dror, 2002; Thomas, 1999). AAE intonation patterns within and at the end of utterances have also been shown to differ from those of other varieties of English (e.g., Foreman, 2000; Holliday, 2016; Thomas et al., 2010).

AAE speech prosody has been studied in many different places all across the United States – from rural communities in Louisiana (Green, 2002), North Carolina (Cole et al., 2005; Wolfram & Thomas, 2002), South Carolina (Goodwin et al., 2002) and Texas (Thomas, 1999) to urban communities in Seattle (Tarone, 1973), Raleigh (McLarty, 2011), Washington, DC (Loman, 1975), Pittsburgh (Gooden, 2009) and Los Angeles (Jun & Foreman, 1996; Foreman, 2000) – but many major dialect regions remain unstudied. Moreover, these studies rarely if ever focused on regional variation, and comparing their findings is complicated because of diverging approaches (Thomas, 2015). As such, Thomas (2015) notes that even though it is likely that “the intonational features that are diagnostically African-American are subject to (...) regional variation” (p. 420), we know very little about how regional variation surfaces in AAE prosody.

One recent study that has looked at regional variation in AAE prosody by directly comparing West and East Coast AAE in terms of rhythmic and melodic variability is the study by Gilbers et al. (2019a), who investigated regional AAE prosody variation in a hip-hop context, analyzing the speech of 16 African-American speakers (8 from the Greater Los Angeles Area and 8 from the Tri-State Area) involved with hip-hop culture. They measured melodic variability or pitch fluctuation based on average pitch delta scores (on a semitone-based scale) per every 10 milliseconds (ms) and found that, on average, West Coast AAE speakers exhibited significantly more pitch variability than East Coast AAE speakers. In other words, they found that East Coast AAE prosody was relatively monotone compared to West Coast AAE prosody. Regarding rhythmic variability, Gilbers et al. (2019a) measured their subjects’ degree of syllable isochrony (i.e., where their speech fit on the stress-timed/syllable-timed continuum)⁴² and overall levels of rhythmic variability in speech. They found that for both domains of rhythmic variability, West Coast AAE speakers showed significantly greater levels of

⁴² The more isochronous a language variety’s stressed and unstressed syllables are, the closer that language variety will be to the syllable-timed end of the continuum.

variation than East Coast AAE speakers. As such, they concluded that West Coast AAE speech rhythm is less rigid than East Coast AAE speech rhythm is.

5.1.2 Flow

As Gilbers et al. (2019a/2020) put it, “[flow] is to rap what prosody is to language; both are concerned with the rhythmic and melodic aspects of their respective domains” (p. 715). Flow has been defined in many ways (see, for example, Adams, 2009, 2015; Connor, 2018; Edwards, 2013; Krims, 2000) but the consensus among most rap scholars today is that flow refers to rap performances’ rhythmic and melodic aspects. Rhythm and especially melody are treated somewhat differently in rap than in many other forms of music, and as such, studying them requires adapted methodologies or newly designed approaches altogether. Below, we discuss flow’s rhythmic and melodic dimensions and provide an overview of what we know about the differences between West and East Coast rap flows.

5.1.2.1 Flow’s rhythmic dimension

Many variables play a role when it comes to flow’s rhythmic dimension. Virtually all rap music is performed in a 4/4-time signature, but flows vary greatly regarding the number of syllables used per musical bar, the length of these notes (e.g., whether they are eighth notes, sixteenth notes, dotted or triplet notes, etc.), and how many musical rests they contain. Moreover, flows are largely defined by their exact musical microtiming. As Gilbers et al. write: “it makes a significant difference in terms of flow whether rappers perform syllables right on the beat or instead slightly before or after” (2019a/2020, p. 716). The most important thing about the way rap deals with rhythm, is that, contrary to singing, rap is primarily percussive in nature. As such, it is more insightful to analyze rap vocals in terms of notes’ temporal location (i.e., as if they were drum patterns) than to analyze rap vocals in terms of note duration as is common in musicological work on (Western) singing (Edwards, 2013; Gilbers et al., 2019a).⁴³

⁴³ Gilbers et al. (2019a/2020) also note that “rhythmic accents and the metrical characteristics of a rap performance can distinguish one flow from another as well” and that rhyme schemes play an important part in this regard because “recurring sequences of rhymes add rhythmic accents that distinguish the flow of bars that are otherwise identical in terms of musical notation” (p. 716), but this is outside the scope of the present study.

5.1.2.2 Flow's melodic dimension

While rap is often distinguished from singing based on its lack of melody, pitch contours are key to what we perceive as flow (e.g., Adams, 2015; Connor, 2018; Gilbers et al., 2019a). Rap performances are usually not melodic in the traditional sense – it is uncommon for rappers to match their vocal pitch to the song's key or 'hit' exact notes like a singer would (Gilbers et al., 2019a; Setaro, Kross, & Griffin, 2014) – but all rappers manipulate pitch in one way or another (Gilbers et al., 2019a). As such, the common criticism of rap as being marked by monotony (see, for example, Kelley, 2011) is clearly unsupported. Adams (2015) and Connor (2018) have compared rap's use of melody to the technique of *Sprechstimme*, a “vocal technique which does not emphasize any notes in particular in its pitch contours” (Gilbers et al., 2019a/2020, p. 716). Gilbers et al. (2019a/2020) further note that “higher levels of pitch fluctuation tend to indicate levity or a more relaxed vibe,” but that “there is most definitely no one-to-one relationship between how much pitch fluctuation a rapper displays and the light-heartedness of the topics they address” (p. 716).

5.1.2.3 West Coast and East Coast rap flows

Up until recently, hardly any qualitative or quantitative research had been done on how exactly West and East Coast rap flows are typically distinct from each other. While he never compares the two regions' flows directly, Edwards (2013) discusses the phenomenon of the “lazy tail” syncopation technique – when the “rapping is squarely in time to the beat, apart from certain syllables or words that are said so that they slide off the beat (...) [adding] variation to the flow and [giving] it a laid-back feel” (2013, p. 34) – which he describes as a stylistic feature typical of West Coast rap that is nearly absent in the work of East Coast rappers. Regarding melody, Edwards notes several rappers, all of whom are/were New York-based – whose rapping is characterized by a relatively monotone flow. In contrast, as Gilbers et al. (2019a) point out, the majority of rappers that Edwards (2013) discusses when talking about rap flows marked by high levels of melodic variability are West Coast-based.

To this date, Gilbers et al. (2019a) is the only study on regional variation in rap flows that directly compared West and East Coast rap flows with regards to rhythmic and melodic variability. They analyzed the rap flows of 16 African-American rappers (8 from the Greater Los Angeles Area and 8 from the Tri-State Area; the same individuals as discussed in section 5.1.1 above). They measured pitch fluctuation in rap recordings in the same way that they analyzed speech

recordings, and found that West Coast rappers (excluding Kendrick Lamar, a West Coast rapper who did something completely different in terms of pitch) exhibited significantly more melodic variation in their rapping than East Coast rappers did. They also found that West Coast rappers' flows were characterized by significantly more rhythmic variation than East Coast rappers' flows in terms of note interval duration. Gilbers et al. (2019a) also noted that West Coast and East Coast rap flows appeared to differ in terms of which notes they tended to 'hit' in a bar, with the West Coast flows showing greater variation in this respect as well.

5.1.3 Hip-hop's language-music connection

There is no definitive answer yet to the question why there is regional variation in rap flows, but recent research suggests that this has much to do with regional linguistic variation. For instance, Kautny (2015) posited the idea that because of their rhythmic characteristics, certain languages or language varieties might lend themselves better to certain styles of flow than to others, and coming from a linguistic perspective, Thomas (2015) wrote that "it could be fruitful to explore the links between [AAE prosodic] features and various styles of music, poetry, and public speaking that African-Americans have bestowed upon American culture" (p. 432). These suggestions make sense in light of previous work on a possible language-music connection. Much research has been done on the claim that composers' music would reflect their native languages' prosody (e.g., Abraham, 1974; Hall, 1953), most notably by Patel, Iversen and Rosenberg (2006). They analyzed prosodic rhythm and melody for French and British English, comparing it to the rhythmic and melodic characteristics of French and British classical music. What they found was that compared to French speech, British English speech was more rhythmically and melodically variable. Parallel findings were observed for British and French (instrumental) classical music, leading the authors to conclude that the regional variation in music in terms of rhythm and melody were informed by regional variation in speech prosody, claiming that "statistical learning of the prosodic patterns of speech creates implicit knowledge of rhythmic and melodic patterns in language, which can in turn influence the creation of rhythmic and tonal patterns in music" (p. 3043). Language and music, especially with regards to rhythm and pitch, are thought to be distinct yet closely related domains operating in fundamentally similar ways (Gilbers et al., 2019a). Barring a few exceptions (e.g., Temperley, 2017), later studies largely replicated Patel et al.'s (2006) findings in other regional contexts (e.g., Hansen, Sadakata, & Pearce, 2016; Huron & Ollen, 2003; McGowan & Levitt, 2011) and for vocal rather than instrumental music as

well (e.g., Jekiel, 2014; Lee, Brown, & Müllensiefen, 2017; Van Handel & Song, 2010).

The suggestions and findings reported in the previous paragraph inspired Gilbers et al. (2019a) to investigate whether the rhythmic and melodic differences between West Coast and East Coast AAE prosody were reflected in the rhythmic and melodic differences between West and East Coast rap flows. As has been discussed for speech and rap individually in sections 5.1.1 and 5.1.2.3 respectively, they found West Coast AAE speech prosody is characterized by more rhythmic and more melodic variation than East Coast AAE speech prosody, and that West Coast rap was marked by more rhythmic variation compared to East Coast rap. They also report that “while no statistically significant difference between [West Coast and East Coast rap] regarding melodic variation was found, a trend towards more melodic variation on the West Coast was observed” (2019a/2020, p. 741). From this, they concluded that in the context of West Coast and East Coast AAE and rap, variation between regional dialects and regional styles of music are likely related to each other.

5.1.4 Second dialect acquisition

In this article, we are looking at second dialect acquisition (SDA), which Siegel (2010) describes as the type of second language acquisition which occurs “when the relationship between the [first language] and the [second language] is close enough for them to be considered by their speakers to be varieties of the same language, or different dialects, rather than different languages” (p. 1). There are different kinds of SDA depending on the nature of the dialects involved – we generally distinguish national dialects (e.g., Australian English versus Canadian English), regional dialects (e.g., New York City English versus Boston English), and social dialects (e.g., Standard Southern British English versus Cockney English or ethnolects like AAE) – and the contexts of the acquisition process (e.g., whether it occurs naturalistically through migration and immersion in a new speech community or whether the SDA process takes place in a classroom setting). SDA takes place in various linguistic domains, from lexicon to morphosyntax and from pragmatics to phonetics. In this study, we are looking at phonetic SDA in a naturalistic setting that involves two regional dialects of what is itself a social dialect or ethnolect of American English: West Coast and East Coast AAE.

Nycz (2015) provides a comprehensive overview of SDA research from a sociophonetic perspective specifically, showing how the accents of geographically mobile speakers change and how these changes “reflect the complex interaction of

linguistic, social, and developmental factors in language use” (p. 469). The basic premise of SDA is relatively straightforward: “people tend to talk like the people they talk to” (p. 470), meaning that increased exposure to a new regional variety will gradually change a person’s speech.⁴⁴ However, the actual development of a second dialect learner’s accent is not necessarily straightforward. Not only is this development hardly ever linear or the same for each individual (even when in similar types of contexts), it is not uniform across accent features either. For instance, Foreman (2003) noticed that a speaker’s rhoticity was less likely to change than vowel quality. An accent feature’s social saliency can play a role in this, as “the use of both [first dialect] and [second dialect] features can be affected by speaker identity, attitude, and topic (Nycz, 2015). For example, Nycz (2013a, 2013b) looked at Canadians who had moved to New York City and found that their accents had gradually converged towards New York City norms for the most part. However, they had largely retained their stereotypical Canadian Raising feature in the MOUTH lexical set, “particularly in the shibboleths *out* and *about*,” presumably to preserve a sense of their Canadian identity, especially in light of the “high salience of Canadian identity in the interview context” (p. 475).

In terms of attainment, many studies report incomplete acquisition of the second dialect’s features – i.e., no complete accommodation to the new dialect’s norms (as far as this is even possible) – even after years of exposure (for an overview, see Siegel, 2010). Hypercorrection or even overshooting are frequently reported as well. In this context, overshooting entails second dialect learners pronouncing the new dialect’s features in an exaggerated manner. For instance, Foreman (2003) notes many of her subjects produced sounds partway between their first and second dialect’s norms, whereas others overshoot the second dialect target, producing slightly exaggerated pronunciations. Moreover, Gilbers (2015, 2018a) reports on a second dialect learner producing exaggeratedly long vowels, presumably out of a desire to fit in with the second dialect’s speech community.

In light of the present study’s focus on prosody, it is worth mentioning that there has only been a single study on naturalistic SDA of English dialects that

⁴⁴ From an Exemplar Theory perspective, this could be explained as being the result of a person’s increased exposure to a new regional variety affecting their categorical representations, causing them to gradually shift in the direction of the new dialect’s categories (for a more extensive discussion of Exemplar Theory, see, e.g., Pierrehumbert, 2001).

examined a suprasegmental variable.⁴⁵ This study by Rogers (1981) looked at changing intonation patterns in two children who had moved from the South of England to Australia. Siegel (2010) reports that Rogers found “significant changes towards [Australian English] intonation and speech rate” for both children in *wh*-questions, in answers to questions, and in statements, but these “changes were not progressive and the children often differed in their output” (Siegel, 2010, p. 37). As such, we do not have a clear idea yet of how well second dialect learners are generally able to acquire prosodic features compared to how well they can acquire non-prosodic features.

Siegel (2010) reports on several SDA studies involving AAE, but all of these are concerned with AAE – a non-standard dialect – in relation to standard varieties of English (speakers learning AAE as a second dialect or native AAE speakers acquiring a standard variety as a second dialect). To the best of our knowledge, only a single SDA study involving different regiolects of AAE has ever been conducted, namely the one reported in Gilbers (2015) and Gilbers (2018a). This case study, which will be further discussed in section 5.1.5.3, diachronically investigated accent change in a speaker who moved from the East Coast to the West Coast, looking at vowel duration (which is generally longer for West Coast AAE than for East Coast AAE; Gilbers, 2015, 2018a). Another aspect of our study that distinguishes it from previous SDA studies is that in the context of the present study, treating SDA as a purely linguistic concept would actually constitute too narrow an interpretation: we are looking at the acquisition of a second regional dialect not just in the domain of language, but in the domain of *music* as well. In this sense, we are not looking at all aspects of language and music, but rather at two of them which play a key role in both domains: rhythm and melody. Given the oft reported language-music connection and the proven existence of regional musical dialects (see, e.g., Patel et al., 2006; Gilbers et al., 2019a), one could imagine that migrating from one musical dialect region to another could lead to the naturalistic acquisition of a second musical dialect in a similar manner to how one would acquire a second linguistic dialect. To our knowledge, second dialect acquisition has never been examined for the domain of music yet, making this the first study of its kind. It also means that we have no idea yet whether the acquisition of a second musical regiolect follows the same patterns as the acquisition of a second linguistic regiolect. What has been

⁴⁵ There have been studies on SDA in light of prosodic features for other languages, but these looked at Japanese, Norwegian and Sui, languages in which, unlike English, “dialects are distinguished by their use of different pitch patterns for the same word” (Siegel, 2010, p. 20).

studied, however, is how rappers may accommodate their flows to the styles of other artists they are collaborating with on a given song (Komaniecki, 2017), and how this could be linked to the concept of linguistic accommodation towards a conversational partner, for instance by accommodating to the addressee's regional accent features. Komaniecki raises the question whether "guest rappers, subconsciously seeking the approval of a track's lead artist, alter their cadence so as to better cohere with their collaborator," adding that this cannot be the sole explanation of flow accommodation, as this explanation minimizes the creative agency of the artists (2017, p. 12).

5.1.5 Case study subject: Tupac "2Pac" Shakur

In this subsection, we will discuss why Tupac "2Pac" Shakur was deemed the optimal subject for a diachronic case study with the aim of finding out what happens to someone's AAE speech prosody and rap flows when they move from one hip-hop region to another. First, we will present a detailed overview of 2Pac's life, focusing on particular life events that may have impacted the way that 2Pac's language and music developed over time, be it directly (e.g., him moving to another dialect region) or indirectly (e.g., events that changed 2Pac's state of mind or perspective, influencing how he wanted to express his regional identity). We will then connect his life story to the research questions and aims of this study, as well as highlight why 2Pac is an excellent subject for a retrospective diachronic case study of this kind, and discuss a previous case study on how 2Pac's accent may have changed over time that was reported in Gilbers (2015) and Gilbers (2018a).

5.1.5.1 The life of Tupac Shakur

5.1.5.1.1 Childhood

Tupac Amaru Shakur was a highly successful and influential African-American gangsta rap artist, actor, poet and civil rights activist. He was born into a revolutionary family on June 16, 1971 in East Harlem, New York City. His mother Afeni Shakur was a prominent member of the Black Panther Party, and was famously pregnant with Tupac while in jail facing a 300-year sentence, a case she would successfully beat herself in court shortly before Tupac's birth. Tupac's family lived in poverty and was forced to move around the East Coast continuously during his childhood, initially within New York City and then to Baltimore, Maryland in 1984. In Baltimore, Tupac enrolled in the Baltimore School of the Arts, where he would start exploring his artistic talents together with fellow students like Jada

Pinkett (who would grow up to become a successful actress herself). Financial troubles forced Tupac to move away from the East Coast to California in 1988 at age 17, first to the Bay Area's Marin City and later to Oakland.

5.1.5.1.2 Music, acting, and controversies surrounding 2Pac

After dropping out of Tamalpais High School in Marin, Tupac began pursuing a career in music, first as a roadie, backup dancer, and occasional guest rapper with the Digital Underground crew and later as a solo artist signed to Interscope Records. On November 12, 1991, he released his debut album *2Pacalypse now*, which featured violent but socially conscious lyrics that quickly drew in a loyal fanbase. As his musical career took off, 2Pac moved to Los Angeles and landed his first acting roles in major motion pictures such as *Juice* (1992) and *Poetic justice* (1993), releasing his sophomore record *Strictly 4 my N.I.G.G.A.Z...* (1993) as well.

2Pac's newfound status as a public figure marked the start of the controversies and legal troubles that would follow him around for the remainder of his life. He got into multiple violent altercations with police – in self-defense, 2Pac even shot two white, off-duty Atlanta police officers who were drunkenly harassing him in late 1993 – and none other than Vice-President Dan Quayle condemned 2Pac's lyrics, saying they had no place in American society after a young Texas resident had claimed that 2Pac's song "Soulja's story" had inspired him to murder a police officer. In a 1994 interview with BET's Ed Gordon, 2Pac had the following to say about the controversies surrounding him: "I had no record all my life, okay? No record, no police record, *until* I made a record [music album]. As my video was debuting on MTV, I was behind bars getting beat up by the police department." 2Pac's controversies and legal issues reached their zenith in late 1994. On the evening of November 30, 2Pac arrived at Quad Recording Studios in Manhattan, right by Times Square, to record a guest verse on a song with Little Shawn. In the building lobby, he was ambushed by a group of men who seemingly knew he was going to be there and who wanted him to hand over his jewelry. 2Pac refused and was reportedly shot five times in the scuffle that ensued. Before going to the hospital, 2Pac took the elevator upstairs where he found several artists from the New York-based record label Bad Boy Records, including Sean "Puff Daddy" Combs and 2Pac's friend Christopher "Biggie Smalls" Wallace (also known as The Notorious B.I.G.). The next morning, mere hours after having been shot, 2Pac checked himself out of the hospital early in order to make a court appearance for a rape charge that he was facing. Despite vehemently proclaiming his innocence – 2Pac suspected that he had been set up by the same group of New York gangsters

that were behind the Quad Studios robbery – he would end up being convicted of sexual abuse in the first degree, receiving a one-and-a-half to four-and-a-half-year sentence.

5.1.5.1.3 2Pac's role in the East Coast/West Coast hip-hop conflict

The events that transpired in late 1994 marked a turning point in 2Pac's life. Up until then, in spite of all the troubles he had faced, he had always felt safe in his own community. As he said himself during an interview with Frank Cooley, recorded on September 20, 1995 while imprisoned at Clinton Correctional Facility:

“They *shot* me.” Straight up, I just kept thinking, “they really did shoot me.” I really did believe at one point, up until I got shot, that no black person would ever shoot me. I was their representative. I believed that, you know, I didn't have to fear my own community. You know, I was like, I represent them. I'm their ambassador to the world. They would never harm me, they would never rob me, they would never do me wrong. But as proven by this false rape charge, as proven by the gunshots, as proven by a lot of the comments you read in the news and in the media, that's not true, you know? I'm just one man, so I just thought about how I would change, what would I do? How can I make them sorry that they ever did this to me?”

From his lyrics and comments during interviews after having been shot in New York, it appears 2Pac grew increasingly paranoid, distrustful, angry and bitter because he felt so betrayed by the people he had always tried to stand up for.

The Quad Studios shooting and allegedly false rape charge in New York also fundamentally changed 2Pac's relationship with the East Coast hip-hop scene. Despite the fact that he had already left his native East Coast at age 17 and had been based in California for his entire musical career, 2Pac had always tried to carefully navigate his bicoastal identity. For one, before adopting the moniker 2Pac, he used to go by the name of MC New York in reference to his hometown. Once he became a professional recording artist, he represented for the West Coast on songs like “Nothin' but love” (recorded in March 1992) and “Representin' 93” (recorded on August 6, 1992), but also paid homage to his birthplace of New York on songs like “Old school” (recorded on September 28, 1994). He also actively stayed in touch with the East Coast hip-hop scene, as evidenced by his frequent collaborations with

New York rappers and producers and his friendship with New York artists like Biggie Smalls. On January 15, 1995, Shakur was interviewed by Vibe Magazine's Kevin Powell while in jail at Rikers Island and still recovering from his gunshot wounds. In this now infamous interview, which would be published in the magazine's April 1995 edition, 2Pac implicated Biggie, Puff Daddy and other prominent figures of New York's hip-hop scene in the botched attempt at his life:

[W]e jumped in the elevator and went upstairs. I'm limping and everything, but I don't feel nothing. It's numb. When we got upstairs, I looked around, and it scared the shit out of me (...) because (...) Puffy [Puff Daddy] was there, Biggie – there was about 40 niggas there. All of them had jewels on. More jewels than me. I saw Booker [the man who had asked Tupac to come over to the studio to record a verse for Little Shawn's record], and he had this look on his face like he was surprised to see me. Why? I had just beeped the buzzer and said I was coming upstairs. (...) Nobody approached me. (...) Puffy was standing back too. I knew Puffy. He knew how much stuff I had done for Biggie before he came out.

To make matters worse, Biggie released the song "Who shot ya?" in February 1995. Although the Bad Boy artist would later publicly state that the song had been recorded long before 2Pac was shot, the song's lyrical content and the moment of its release further solidified 2Pac's suspicions that his New York friends had set him up that night.

While imprisoned, Interscope released 2Pac's third solo album *Me against the world*, which became the number one album in the United States, selling millions of copies. Outside 2Pac's prison cell, tensions between the West Coast and East Coast hip-hop scenes grew. These tensions stemmed from the fact that in the late 1980s and early 1990s, West Coast hip-hop had overtaken East Coast hip-hop as the country's dominant hip-hop region, something which did not sit well with many New Yorkers, as the culture had been invented in their city (Gilbers, 2018a; Hess, 2009; Morgan, 2001, 2002). On August 3, 1995 at the second annual Source Hip-Hop Music Awards, the bicoastal tensions escalated dramatically. As Hess (2009) writes:

A true turning point in the perception of rap music as an East Coast or West Coast thing came with the 1995 Source Awards. [Hip-hop], from its inception, had been fiercely territorial, but this second annual event, held

in New York City's Madison Square Garden on August 3, 1995, brought regional tensions in [hip-hop] to a head. (...) The New York audience members remained loyal to their hometown artists and booed [Snoop Doggy Dogg], one of rap's biggest stars [who hails from Long Beach, California]. Snoop famously responded, his voice incredulous, "the East Coast ain't got no love for Dr. Dre and Snoop Dogg and Death Row [Records, the West Coast's leading gangsta rap label at the time]?" The audience booed again. (p. xxii)

Marion "Suge" Knight, the co-founder and CEO of Death Row Records, proceeded to pour more fuel on the fire later that night by subliminally mocking Bad Boy's CEO Puff Daddy on-stage, turning the bicoastal conflict into a conflict between the two regions' major gangsta rap record labels and aligning himself and Death Row Records with 2Pac, as they now shared a common adversary. This was the perfect set-up for Knight's next move, which was to post 2Pac's \$1.4 million bail on the condition that 2Pac sign to Death Row Records. 2Pac agreed to the deal and was released from prison on October 13, 1995 after spending 11 months behind bars.⁴⁶

Energized by his newfound freedom and angry at the East Coast scene, 2Pac started working on new music the day of his release, finishing a double album called *All eyez on me* within two months. On the album, his tone had changed drastically compared to his previous work. The songs were less politically engaged than on his previous albums. Instead, it celebrated the Los Angeles gangsta lifestyle, which 2Pac fully embraced upon his return to Los Angeles, immersing himself in the city's gang scene through his Death Row connections. Most importantly, the album was a clear testament to 2Pac's allegiance to West Coast hip-hop and renunciation of his East Coast roots. The album's first single, released on December 3, 1995, was titled "California love" and featured lyrics that painted West Coast hip-hop culture as being superior to East Coast hip-hop culture, and the album artwork featured a picture of 2Pac throwing his "dubs" up (i.e., he performed the characteristic "W" hand sign to represent for the West Coast) and wearing a Death Row Records chain. Released on February 13, 1996, *All eyez on me* became a major success and would eventually be certified Diamond by the Recording Industry Association of America.

⁴⁶ Technically, Death Row Records was a subsidiary label of Interscope, so Death Row's signing of 2Pac was not so much the hostile takeover that it has often been portrayed to be, but rather it was a clever business move of Interscope's CEO Jimmy Iovine to free one of his top-selling artists without damaging his company's image (Hughes, Järvi, & Pray, 2017).

Following 2Pac's release from prison, the East Coast/West Coast conflict continued worsening in terms of scope and how violent it was. On December 16, 1995, while shooting a music video in Brooklyn, the trailers of Death Row artists Snoop Doggy Dogg and Tha Dogg Pound were shot at, and rappers not affiliated with Death Row or Bad Boy (e.g., Capone, Noreaga, and Mobb Deep) also got involved with the feud. In the midst of all this, 2Pac continued expressing his grievances with East Coast hip-hop and Bad Boy Records both in interviews and in his music. On June 6, 1996, he released a song that is arguably the most memorable diss track⁴⁷ in hip-hop history: "Hit 'em up" (Shakur, Greenidge, Washington, Fula, & Jackson, 1996). In the song, 2Pac brutally attacked Biggie and his label mates, aggressively representing for Death Row and West Coast hip-hop in the process:

First off, fuck your bitch and the clique you claim
Westside when we ride, come equipped with game
You claim to be a player, but I fucked your wife
We bust on Bad Boys, niggas fucked for life
Plus, Puffy trying to see me, weak hearts I rip
Biggie Smalls and Junior M.A.F.I.A. some mark-ass bitches
(...) I'll let them niggas know it's on for life
Don't let the Westside ride tonight
Bad Boy murdered on wax and killed
Fuck with me and get your caps peeled

The song sent shock waves through the hip-hop community, but neither Biggie nor any other Bad Boy Records artist ever responded with a diss track.

On September 7, 1996, 2Pac attended a Mike Tyson boxing match in Las Vegas. Following the fight, 2Pac and his Death Row entourage ran into a man named Orlando "Baby Lane" Anderson at the MGM Grand Hotel. Anderson was a member of the Southside Compton Crips gang that members of 2Pac's entourage had unsettled grievances with. Security camera footage from that moment shows how 2Pac and the rest of the group rushed Anderson and beat him up before exiting the hotel. A few hours later, Suge Knight and 2Pac were driving on the Las Vegas Strip when suddenly they became the victims of a drive-by shooting. Six days later, on September 13, 1996, 2Pac succumbed to his injuries in the hospital, passing away at the age of 25. Many conspiracy theories claim that the shooting was in connection

⁴⁷ A "diss track" is a rap song written with the goal of disrespecting one's competition.

to the East Coast/West Coast conflict, some even suggesting that Biggie Smalls and/or Puff Daddy had put out a bounty on 2Pac and Suge Knight. However, while the murder has never officially been solved, the most likely scenario is that 2Pac was shot in retaliation for beating up Anderson, possibly by Anderson himself. However, it does seem highly likely that the murder of Biggie Smalls in Los Angeles on March 9, 1997 was in fact in retaliation for 2Pac's death, although this murder has never been solved officially either.

Despite all his efforts to represent for the West Coast during the final year of his life, 2Pac still appeared to struggle with his regional identity and with people's response to him representing for the West Coast. In an interview with VIBE Magazine on May 4, 1996, 2Pac said the following about this:

This is not a new allegiance to the West Coast. I been on the West Coast all this time. (...) It's just that by me keeping it real, I always said where I came from. I always gave New York they props.⁴⁸ On *Me against the world*, I took a whole song ["Old school"] to give it up [for New York]. So now on the next album [*All eyez on me*], when I want to give it up for my home, where I'm at, everybody got a problem? Why didn't they have no problem with Biggie saying "Brooklyn in the house" every fucking show he do? (...) Why is it not hip-hop when I do it?

It should be noted here that during the last few weeks of his life, while he was most definitely still feuding with Biggie and the rest of Bad Boy Records, 2Pac started playing with the idea of undoing the regional divide that he had helped create himself. He had just begun working on a project called "One nation", for which he intended to collaborate with artists from all over the country, during the summer of 1996, and just a few days before his death, 2Pac and Suge Knight announced their intentions of starting an East Coast division of Death Row Records, but these projects never materialized. It should also be noted that despite these ambitions, he did record a violently anti-East Coast album titled *The don Killuminati: The 7 day theory* (which was released posthumously under his new alias of Makaveli⁴⁹ on November 5, 1996) around the same time, so it seems that in his final weeks, 2Pac

⁴⁸ The phrase *to give props* is slang for "to give credit" or "to pay respect."

⁴⁹ Shakur named himself after the Italian political thinker Niccolò Machiavelli, whose ideas had greatly inspired his own approach in the East Coast/West Coast hip-hop conflict.

was still conflicted as to what he wanted his next move in the East Coast/West Coast conflict to be.

5.1.5.2 Motivation for selecting 2Pac

The motivation for selecting 2Pac as the subject of this case study was multifold. For one, 2Pac meets the minimum requirements to be included: he was an African-American rapper and native speaker of AAE who grew up in one major dialect region (the East Coast) and moved to another (the West Coast) as a young adolescent. 2Pac does not simply meet the minimum criteria to be included, though; his life story actually makes him a particularly interesting (arguably the most interesting) person to study in light of the research question at hand. He not only moved from one region to another, he also consciously switched regional allegiances towards the end of his life. Considering how closely language and rapping styles are linked to how rappers express their regional identities, this could mean that 2Pac had some degree of agency in how his speech and rapping developed over time. In other words, it could be that before he got involved in the East Coast/West Coast hip-hop feud, the development of his speech and rapping occurred passively, but that he actively tried to manipulate his accent towards the end of his life in order to fit in with his regional scene better and be accepted as West Coast hip-hop's primary figurehead. The final reason for selecting 2Pac is a methodologically informed one. 2Pac is such a suitable candidate for a retrospective diachronic case study on speech and rap because as an artist with a catalogue of over 500 songs and a frequently interviewed public figure, hundreds of recordings of 2Pac speaking or rapping have been preserved. Moreover, we even have sufficient metainformation on most of these to identify when these recordings were made, often accurate to the month and in many cases even accurate to the exact date of recording.⁵⁰

5.1.5.3 Previous case study on 2Pac's lyrical and linguistic development

The case study we report on in this article is not the first study investigating 2Pac's language development. As briefly mentioned above, Gilbers (2015) conducted a

⁵⁰ Looking at the dates that these interviews and songs were recorded rather than the dates they were released is of vital importance in this case, as it is not uncommon for interviews and especially songs to be released months or even years after they were recorded. In fact, hundreds of 2Pac's songs were released posthumously.

retrospective diachronic study on the development of 2Pac's /æ/ vowel duration – which is longer for West Coast AAE than it is for East Coast AAE (Morgan, 2001, 2002; Gilbers, 2015, 2018a) – between 1988 (the year 2Pac moved to California) and 1996 (the year of his death), looking at one interview recording per year. This study was reported on again in Gilbers (2018a) alongside an analysis of how 2Pac's lyrical content developed in light of his role in the East Coast/West Coast hip-hop feud. In his lyrics, 2Pac was shown to become more pro-West Coast and anti-East Coast while he was signed to Death Row Records. Regarding his accent, his vowels were shown to have become longer over time. Interestingly, a pattern of gradual development towards longer West Coast-like vowels was observed in 2Pac's pre-Death Row period, suggesting that increased exposure gradually influenced his mental vowel duration representations, causing his vowels to become longer on average. In the final year of his life, however, the rate of change towards longer vowels increased drastically, from a yearly average increase of 2.31% growth before signing to Death Row Records to an increase of 18.86% in the last year of his life. Gilbers (2015, 2018a) concluded from this that 2Pac may have made a conscious effort to sound more West Coast-like in the final year of his life, something which is supported by the observation that some of his vowels in 1996 even appeared to overshoot the target vowel duration. Overall, a pattern of increased variation in vowel duration was also observed, which, looking at it from a Complex Dynamic Systems Theory perspective, is usually a sign of a person's linguistic system becoming unstable (for a more detailed discussion of Complex Dynamic Systems Theory in relation to language development, see, e.g., De Bot, Lowie, & Verspoor, 2007).

5.1.6 Aims and hypotheses

This case study on 2Pac aims to find out how SDA takes place for the domains of prosodic melody and rhythm, specifically in the context of hip-hop, in which regional identity plays a substantial – even life or death – role and language is an important tool of expressing that regional identity. Moreover, we aim to find out if migrating to another region affects an artist's music in terms of melodic and rhythmic variation, and if a potential change in this respect reflects the prosodic changes we may observe for the domain of language. A few observations that have been discussed in detail above are key to the present study's hypotheses. These observations are the following:

- West Coast AAE speech and rap flows are more melodically and rhythmically diverse than East Coast AAE speech and rap flows (Gilbers et al., 2019a).
- Previous research on the relationship between regional variation in AAE speech and rap flows has shown that speech and rap pattern in similar ways (Gilbers et al., 2019a).
- Naturalistic SDA is often characterized by gradual accommodation towards the second dialect's accent norms due to increased exposure levels (Nycz, 2015; Siegel, 2010).
- Rappers may accommodate their rap styles to the styles of artists they are collaborating with (Komaniecki, 2017).
- Regionally marked AAE accent features and rap flows are tools to represent for one's region (Gilbers et al., 2019a; Morgan, 2001, 2002).
- 2Pac moved to another dialect region and eventually became involved in a regional conflict that gave him a strong incentive to adjust his regional identity and how he expressed it (Gilbers, 2015, 2018a).
- A previous case study on 2Pac's language development showed gradual accommodation towards West Coast AAE vowel duration standards followed by an increased rate of accommodation during the time he was signed to Death Row Records (Gilbers, 2015, 2018a).

Based on these observations, the four main hypotheses of this study were formed:

- 1) Accommodating to West Coast AAE norms, 2Pac exhibited increasing levels of pitch variability in his speech over time.
- 2) Accommodating to West Coast rap flow norms, 2Pac exhibited increasing levels of pitch variability in his rapping over time due to increased exposure.
- 3) 2Pac exhibited increasing levels of rhythmic variability in his speech over time, both in terms of the stress-timed/syllable-timed continuum and in terms of overall variation across utterances.
- 4) 2Pac exhibited increasing levels of rhythmic variability in his rapping over time, both in terms of note interval length and in terms of which notes he tended to use in his bars.

These hypotheses will be tested by carefully examining the development of his variation levels over time, both regarding the rate of change and the direction of the

changes. We will also directly compare average variation levels for the pre-Death Row Records and the Death Row period, as we would expect higher levels of variation in the Death Row period due to 2Pac's role in the East Coast/West Coast hip-hop conflict. From these four hypotheses follows a fifth, overarching hypothesis:

- 5) The diachronic development of 2Pac's rap flows follows the same pattern as the diachronic development of his speech prosody regarding rhythmic and melodic variability.

If the results support this fifth hypothesis, this would suggest that the acquisition process of a second musical regiolect is similar to the acquisition process of a second linguistic regiolect, providing further support for a language-music connection.

5.2 Method

5.2.1 Prosody and flow – Melody

5.2.1.1 Materials

5.2.1.1.1 Speech

Audio from 16 interviews with 2Pac (ranging from live television interviews to phone interviews over the phone for newspapers or magazines) was extracted from YouTube videos. The aim was to cover the period from late 1988 (the first 2Pac interview available dates back to the fall of 1988) until September 1996 (when 2Pac passed away) as well as possible considering that in some periods, 2Pac gave many interviews while he was promoting new projects, whereas he gave none at all in other periods. One interview was selected per yearly quarter (i.e., quarter 1 (Q1) lasted from January 1 until March 31, quarter 2 (Q2) from April 1 until June 30, etc.) whenever an interview recording (of sufficient audio quality and length for auditory analysis) was available for that particular quarter. Because the final period of 2Pac's life was identified as the most interesting period to be studied and because more interviews from that period were available, two interviews per quarter were selected (if available) for the last year of 2Pac's life (i.e., during his tenure at Death Row Records). An overview of the selected interviews is presented in Table 5.1. Per interview, 15 excerpts of uninterrupted speech (10 to 15 seconds in length) were

Table 5.1. Information regarding the interviews selected for prosodic analysis.

Date	Interviewer(s)/context	Source
1988 (Q4)	Tamalpais High School teachers	youtu.be/v_XT9-C5Qu8
1989-09 (Q3)	Bomani Bakari (WRFG Atlanta)	youtu.be/oUAFDRihVq8
1991-11 (Q4)	<i>2Pacalypse now</i> promo interview	youtu.be/kR6OKmDIojM
1992-02-02 (Q1)	Tanya Hart (BET)	youtu.be/mHRpOd5Ero4
1993-07-19 (Q3)	Arsenio Hall	youtu.be/bGdzl1YWlJs
1993-10-28 (Q4)	Chuck Phillips (Rolling Stone)	youtu.be/KNnBxN979Bo
1994-03-09 (Q1)	Abbie Kears (MTV News)	youtu.be/pNSRx14s7B4
1994-09-26 (Q3)	Mats Nileskär (P3 Soul)	youtu.be/M8IA31P-5go
1994-10-15 (Q4)	Ed Gordon (BET)	youtu.be/ab3v0GfgrA
1995-09-20 (Q3)	Frank Cooley (Clinton Correctional Facility)	youtu.be/-7DRo20X0il
1995-10-19 (Q4)	Chuck Phillips (LA Times)	youtu.be/nVWRsFZTUOzk
1995-10-26 (Q4)	Tabitha Soren (MTV)	youtu.be/GpPbYgJRg0Q
1996-04-19 (Q2)	Sway Calloway (KMEL)	youtu.be/STFw4kBEpvg
1996-05-04 (Q2)	VIBE Magazine	youtu.be/Q4zAdiWVG1Q
1996-08-24 (Q3)	Rob Marriott	youtu.be/tpj7PgLXBE
1996-08-27 (Q3)	<i>Gang related</i> promo interview	youtu.be/kdRcVZR6pKI

selected for analysis.⁵¹ None of these excerpts featured other voices than 2Pac's, nor did they feature excessive background noise that could possibly interfere with the acoustic measurements.

5.2.1.1.2 Rap

To analyze 2Pac's pitch variability in rap, a capella recordings from 28 of his songs were collected. All of these a capella recordings were so-called 'studio a capellas' that were either officially released or leaked. Because the study's scope is limited to rap vocals, any instances of more traditional singing (i.e., controlled pitch contours of a musical melody) were manually removed from the recordings using Adobe Audition software (Adobe Inc., version 3.0). None of the recordings featured voices that were artificially pitched up or down. Moreover, none of the voices could have been auto-tuned – i.e., the pitch as performed by the artists was not rounded up or down to the nearest semitone – since the Auto-Tune technology was not invented until after 2Pac's passing.

As was the case for 2Pac's interviews, it was attempted to cover 2Pac's musical output over time as well as possible, taking into account that 2Pac recorded more music in certain periods than in others. One song was selected per yearly quarter

⁵¹ Only 10 excerpts that fit the study's requirements could be extracted from the July 19, 1993 interview with 2Pac.

whenever an a capella recording (of sufficient audio quality) of that song was available for that particular period. Note that the songs were selected on the basis of when they were *recorded*, not when they were *released*. Recording dates for individual songs were assessed through examination of label and recording studio logbooks that have become available to the public, print sources, interviews, and more. Much of this information has previously been accumulated by 2Pac enthusiasts online, and all available sources were cross-referenced in order to be sure none of the selected recordings were dated erroneously. Because the final period of 2Pac's life was identified as the most interesting period to be studied and because more a capella recordings were available for the later stages of his career, multiple songs were selected from the third quarter of 1994 onward: two songs for the third quarter of 1994, three songs for the fourth quarter of 1994, and one per month (i.e., three per quarter) from October 1995 onward. All 2Pac verses featured in the songs that were selected were analyzed for pitch with a minimum of 1 verse and a maximum of 3 verses per song. Table 5.2 presents an overview of the verses that were used for the pitch analyses of this study.

5.2.1.2 Procedure

The speech excerpts and rap verses described above were phonetically analyzed using the same method. In this subsection, we will briefly discuss the steps involved in extracting the pitch data from the recordings. For a more detailed description of the procedure, we refer the reader to the method section in Gilbers et al. (2019a), as the approach of the present study was identical to that one's.

For each recording, fundamental frequency was measured in Hertz (Hz) every 10 ms in Praat (version 6.0.21, Boersma & Weenink, 2016). These measurements were performed automatically using a script that was modified from Cook (2002). The Hz values were subsequently converted to the semitone-based, logarithmic scale as described in Gilbers et al. (2019a), which covers a frequency range of 55 Hz (A₀) until 440 Hz (A₃).⁵² After conversion to the semitone-based scale, pitch contours for all selected speech excerpts and rap verses were plotted so that their degree of pitch fluctuation could be visually compared. Furthermore, absolute delta scores (i.e., the difference between one measurement and the next measurement 10 ms later) were assessed so that the intensity of the pitch fluctuation displayed could be quantified. Unrealistically large delta values (arbitrarily defined as pitch jumps

⁵² For more details on the semitone-based scale that was used, please consult section 3.2.1.2 of the present dissertation.

Table 5.2. Rap verses selected for pitch analysis.

Recording date	Song title	Verse (length)
1998-03 (Q1)	I saw your girl	1 (0:37), 2 (0:36), 3 (1:03)
1991-10 (Q4)	Crooked nigga too	1 (0:41), 2 (0:42), 3 (0:41)
1992-03 (Q1)	Let them thangs go	1 (0:58), 2 (0:50)
1992-05 (Q2)	I wonda if heaven's got a ghetto	1 (0:48), 2 (0:49), 3 (0:50)
1992-09 (Q3)	N.I.G.G.A.	1 (1:00)
1992-12 (Q4)	Holler if ya hear me	1 (0:58), 2 (0:45), 3 (0:41)
1993-04 (Q2)	Thug 4 life	1 (0:49), 2 (0:35)
1993-09 (Q3)	Hellrazor	1 (1:09), 2 (1:01), 3 (1:02)
1993-10 (Q4)	Out on bail	1 (1:00), 2 (1:01)
1994-01 (Q1)	The uppercut	1 (0:41), 2 (0:31)
1994-05 (Q2)	Fuck all y'all	1 (0:46), 2 (0:48), 3 (0:46)
1994-09-28 (Q3)	Old school	1 (0:45), 2 (0:45), 3 (0:23)
1994-09-29 (Q3)	Me against the world	1 (0:46), 2 (0:39)
1994-10 (Q4)	Enemies with me	1 (0:47)
1994-11 (Q4)	Thug style	1 (0:40), 2 (0:40), 3 (0:40)
1994-11-30 (Q4)	The heat (Representin' 4 Ron G)	1 (0:50)
1995-10-27 (Q4)	Komradz (So so crazy)	1 (0:39), 2 (0:20)
1995-11 (Q4)	Letter 2 my unborn	1 (0:37), 2 (0:36), 3 (0:35)
1995-12-14 (Q4)	NY '87	1 (0:44)
1996-01-12 (Q1)	Starin' through my rearview	1 (0:51), 2 (0:41)
1996-02-19 (Q1)	Until the end of time	1 (0:30), 2 (0:29), 3 (0:28)
1996-03-29 (Q1)	Hit 'em up	1 (0:42), 2 (0:40)
1996-04 (Q2)	Um dumpin'	1 (0:42)
1996-05 (Q2)	Don't go to sleep	1 (0:37)
1996-06 (Q2)	Fright night (Whatcha gonna do?)	1 (0:58), 2 (0:39)
1996-07 (Q3)	Niggaz nature	1 (0:39), 2 (0:40), 3 (0:40)
1996-08 (Q3)	One day at a time	1 (0:57)
1996-09-06 (Q3)	Letz get it on (Ready 2 rumble)	1 (0:47), 2 (0:35)

of 5 semitones per 10 ms or larger) were removed from the data, as such pitch jumps are often the result of Praat erroneously measuring high pitch jumps (e.g., registering a one-semitone decrease as a 11-semitone increase).

5.2.2 Prosody and flow – Rhythm

This section deals with the methodology used for the part of the study focusing on rhythmic variation in 2Pac's speech and rap flows.

5.2.2.1 Materials

5.2.2.1.1 Speech

For each of the 2Pac interview recordings mentioned in Table 5.1, five speech excerpts (10 to 15 seconds in length) were selected for rhythmic analysis. These five excerpts were the same as the first five (out of 15) excerpts used for the pitch analyses.

5.2.2.1.2 Rap

The same songs that were selected for pitch analysis were analyzed for rhythmic analysis as long as they fit the criteria that were defined for the rhythmic analyses. The criteria were that songs had to have at least one verse of 16 bars in length, and that the song's original studio recording (i.e., the vocals accompanied by the beat they were recorded over) was available. Out of the 28 songs selected for pitch analysis, only 4 did not meet these criteria: "I saw your girl" from March 1988 (the a capella for this song is a very early demo of a song that has never been released), "Let them thangs go" from March 1992 (this song comprises multiple short verses, none of which are 16 bars in length), "Hellrazor" from September 1993 (the sound quality of this song's original, unofficially released version was insufficient for our analyses), and "The uppercut" from January 1994 (this is one of the few 2Pac songs that has never become publicly available). Contrary to the rap verses selected for pitch analysis, full studio recordings rather than a capella verses were used. The reason for this is that instrumental accompaniment allowed for more accurate division of the verses into separate bars (see the Procedure subsection below for details). More importantly, without instrumentation accompanying the vocals, it would be impossible to analyze a rapper's microtiming in relation to the music (i.e., it is impossible to assess whether rappers rap their syllables before, on, or after the beat without hearing their rapping accompanied by the beat).⁵³ One verse was analyzed per song, and if a song featured multiple 2Pac verses, the first one was selected.

⁵³ We made sure to only analyze original recordings rather than (posthumously) remixed versions of songs. This is because on remixes, the beats were built around 2Pac's existing vocal recordings, meaning that we cannot be sure that the microtiming in relation to the beat is exactly as 2Pac intended it to be. Moreover, some remixed versions feature vocals that have been slowed down, sped up, or even cut together in a way that 2Pac never performed them, making them ineligible for analysis for obvious reasons.

5.2.2.2 Procedure

This study follows the exact same procedure for rhythmic analyses of speech and rap as Gilbers et al. (2019a). We will briefly describe the steps involved in the present subsection, but would like to refer the reader to Gilbers et al.'s (2019a) method section for a more detailed description of the procedure.

5.2.2.2.1 Speech

Rhythmic variability in speech was assessed on the basis of vowel duration, which is considered a generally robust and relatively easy to measure variable (see Thomas & Carter, 2006 for a more extensive description). Measurements were performed manually, since automating measurements using Praat scripts resulted in too many erroneous assessments. Following Thomas and Carter (2006), if a syllable's nucleus was occupied by a syllabic consonant rather than by a vowel, the syllabic consonant's length was measured. A total of 4616 syllables were measured this way.

The present study's approach to quantifying rhythmic variability in speech follows Gilbers et al.'s (2019a) method, which itself constitutes a modified version of the methods described in Thomas & Carter (2006), Patel and Daniele (2003), and Patel et al. (2006). It was decided to analyze rhythmic variability not through only one but through two different measurements that analyze variability from two different perspectives. The first of these is the normalized pairwise variability index (nPVI; Patel & Daniele, 2003; Patel et al., 2006),⁵⁴ which reflects variability along the stress-timed/syllable-timed continuum with higher values indicating relatively higher levels of stress-timedness. Thomas and Carter (2006) note that one of the nPVI measurement's advantages is that it controls for overall speech rate, allowing for fair comparisons of speech with different speech rates. The second measurement is the coefficient of variation (CV) measurement: a dataset's standard deviation divided by its mean, making it a normalized version of the standard deviation measurement that allows for fair variation comparisons across recordings regardless of the size of their mean values (N. Segalowitz, Poulsen, & S. Segalowitz, 1999; N. Segalowitz & Hulstijn, 2005). CV was chosen to be used alongside the nPVI measurement because it reflects variation in a more holistic sense, describing overall degrees of variation across a whole utterance rather than merely comparing the durations of adjacent syllables.

⁵⁴ The nPVI measurement was based on the PVI measurement developed by Low, Grabe, and Nolan (2000).

5.2.2.2.2 Rap

While the same approach could be used to study melodic variation in speech and rap, different approaches were required for studying rhythmic variation in speech and rap. In order to get an accurate representation of rap flows' rhythmic characteristics, they need to be analyzed in conjunction with the beats accompanying them (Adams, 2015; Krims, 2000), which effectively means that unlike speech, rap flows cannot be reliably analyzed rhythmically using Praat (Boersma & Weenink, 2016) because the instruments' waveforms would then obscure the voice's waveforms. For this reason, we employed the method for analyzing rhythmic variability and microtiming in rap flows that was first proposed in Gilbers et al. (2019a).⁵⁵ Based on the Musical Instrument Digital Interface (MIDI), this approach revolves around the actual performances of rap rhythms, and it not only allows for highly accurate representations of rappers' rhythmic subtleties, but also for the quantification of these subtleties so that different rap performances can be compared to each other as well as be statistically analyzed.

5.2.2.2.2.1 Rhythmically analyzing rap flows' microtiming using MIDI

Each song that was selected for analysis was extracted in WAVE format (.wav) and loaded into the digital audio workstation (DAW) software Maschine (Native Instruments, version 2.3). Through Maschine's on-board sampling interface, the 16-bar target excerpt's exact start and end points were determined through visual inspection of the waveforms displayed on-screen and by carefully listening to the song's audio until the excerpt would play back as a perfect 16-bar loop. The rest of the song was deleted afterwards. Next, the song's exact beats per minute (BPM) value was assessed to ensure that the software would play back the loop in the right tempo, and subsequently, the excerpt was automatically divided into 16 separate units (exactly 1 bar in length) using the program's 'Slice' tool. The final preparatory step involved loading percussive sounds that were sonically unobtrusive (heavily low-pass filtered snare drums) onto the drum pads of the Maschine Mikro Mk 2 controller (Native Instruments) that was used.

⁵⁵ For a detailed description of this method, an in-depth discussion of the motivations underlying said method's design, and a discussion of the method's excellent inter-coder reliability (which was assessed by calculating intraclass correlation coefficient estimates as well as their 95% confidence intervals based on a single-measures, absolute-agreement, two-way mixed-effects model), we refer the reader to Gilbers et al. (2019a).

Next, the rhythms of each bar's rapping were recreated in MIDI-format by rhythmically tapping along with 2Pac's flow on the electronic drum pads to get an approximation of his microtiming. These approximations were subsequently corrected by manually tweaking each note's temporal position if necessary (i.e., moving a note forward or backward so that it aligned with 2Pac's timing as closely as possible). Once these steps were completed for all 16 bars, the recordings were exported in MIDI-format and converted to text files. This was done by means of a script designed to extract numerical MIDI 'tick'⁵⁶ data available online (Flash Music Games, 2018). These data detail on which MIDI tick each syllable was performed. The MIDI tick data were entered into Excel, after which the temporal interval distances between adjacent notes were calculated in terms of MIDI ticks for each bar. For the rhythmic analysis, the CV measurement described earlier was the measurement of choice. Following Gilbers et al. (2019a), it was decided not to analyze musical rhythm using the nPVI measurement.

The raw MIDI data were also used to create "heat map" visualizations of which 64th notes of a bar 2Pac used most often on average. For these visualizations, raw MIDI tick measurements for each bar were grouped into 64 different blocks representing 64th notes (each block represents 60 MIDI ticks in length, meaning that raw measurements with a MIDI 'tick' value between 0 and 59 were grouped into the first 64th note, notes with a value between 60 and 119 were grouped into the second 64th note, etc.). Subsequently, average frequency of occurrence values were calculated and plotted such that the most frequently used 64th notes in a bar received a darker hue than 64th notes 2Pac used less often. Such heat maps were created for each individual song analyzed. Moreover, average heat maps for 2Pac's pre-Death Row Records era and his Death Row Records era were created.

5.2.3 Statistical analysis

The data were statistically analyzed by means of one-sided independent samples *t*-tests. Pearson correlation analyses were performed for the study's data in relation to time. All of the study's analyses were performed in IBM SPSS Statistics 26.

⁵⁶ MIDI's temporal resolution is expressed in terms of 'ticks': the number of possible MIDI pulses per note. For an overview of how MIDI tick values correspond to musical temporal units, see Gilbers et al. (2019a/2020, p. 724-725).

Figure 5.1. Development of 2Pac’s pitch variability (average delta pitch values per 10 ms) in speech, presented per quarter. Dark gray bars represent 2Pac’s pre-Death Row Records era; light gray bars represent 2Pac’s Death Row Records era. From 1995’s fourth quarter onward, bars reflect the average delta value for two interviews from that quarter; the bars before represent delta values for single interviews. Moving window averages (based on both three-quarter and five-quarter periods) are presented alongside West and East Coast baselines as reported by Gilbers et al. (2019a).

5.3 Results

In this section, the results of our diachronic investigation into the development of 2Pac’s prosody and flow are presented, firstly regarding melody for speech and rap, and secondly regarding rhythm for speech and rap.⁵⁷

5.3.1 Melody

5.3.2 Melody – Speech prosody

This subsection deals with how 2Pac’s degree of pitch fluctuation in speech developed over time. As such, it is linked to the first hypothesis of the study, i.e., that 2Pac’s speech would be characterized by increasing levels of pitch variability over time and that his speech would be markedly more melodically variable during his stint at Death Row Records than before. Figure 5.1 presents the results from this investigation, plotting how 2Pac’s pitch variability in speech developed between

⁵⁷ For an overview of the melodic and rhythmic variability data separated per recording, see Appendix Table 5.1 and Appendix Table 5.2.

Figure 5.2. (A) Speech pitch contour example from this study’s first 2Pac interview (pre-Death Row period) – 1988 (Q4), excerpt 5: “Well, the way that my mother brought me up is no lies. You know, total truth. Everything is real in society, you know. Everything – if something’s going on wrong in the house, I know everything, so. . .”; and (B) speech pitch contour example from this study’s last 2Pac interview (Death Row period) – 1996-08-27 (Q3), (part of) excerpt 3: “I never had a co-star that really gave a fuck. What did it take to get me to do my job, and that’s all I ever wanted, to – long as you can take away these small things that you might be able to handle that I can’t handle, but there are major things that I. . .”

1988 and 1996. Figures 5.2A and 5.2B show examples of 2Pac’s pitch contours in speech from this study’s earliest interview and latest interview respectively.

At first glance, visual inspection of Figure 5.1 would suggest that 2Pac’s speech clearly became more melodically variable between 1988 and 1996: during the final quarter of 1988, when he had just moved to California, his speech was on par with the East Coast AAE baseline as assessed by Gilbers et al. (2019a), and in the third quarter of 1996 – the final months of his life – the pitch fluctuation levels he displayed in his speech followed West Coast AAE norms. However, if we look at the data points in between, a more muddled picture emerges. The development of 2Pac’s display of pitch variability in speech is highly erratic. A slight upward trend is apparent for pitch variability over time, but no clear, linear development in the direction of West Coast AAE’s higher levels of pitch fluctuation can be observed. A Pearson correlation analysis supports this visual interpretation of Figure 5.1, as it found a small, statistically non-significant positive correlation between degree of pitch variability in speech and time, $r(14) = .120$, $p = .965$.

To test the hypothesis that 2Pac's speech would exhibit markedly more pitch variation during his tenure at Death Row Records than before, a one-sided independent samples *t*-test was performed. 2Pac's speech was found to have an average pitch fluctuation slope of 0.302 semitones per every 10 ms (*SD* = 0.027) before he was signed to Death Row Records, and an average pitch fluctuation slope of 0.279 (*SD* = 0.047) while he was signed to Death Row Records. This was a non-significant difference with a medium effect size, $t(14) = 1.235$, $p = .119$, $d = 0.600$. The results hence do not provide support for the first hypothesis, as in fact, 2Pac's pitch variability in speech was lower on average after he had signed to Death Row.

5.3.2.1 Melody – Rap flows

This subsection deals with how 2Pac's degree of pitch fluctuation in rap developed over time. It is thus linked to the study's second hypothesis, i.e., that 2Pac's rap flows would be characterized by increasing levels of pitch variability over time and that his rapping would be noticeably more melodically variable during his stint at Death Row Records than before. Figure 5.3 presents the results from this investigation, plotting how 2Pac's pitch variability in rap developed between 1988 and 1996. Figures 5.4A and 5.4B show examples of 2Pac's pitch contours in rap from the pre-Death Row period and from the Death Row period respectively.

Figure 5.3 appears to show a number of things. First of all, we see that 2Pac's rapping tends to exhibit relatively high levels of pitch fluctuation across the entire dataset. Barring a few exceptions, all 2Pac songs analyzed are roughly equal to or surpass the high levels of pitch fluctuation reported for West Coast rap flows by Gilbers et al. (2019a). That being said, a trend of increased pitch fluctuation over time can be observed, with the songs recorded in 2Pac's Death Row Records period all exhibiting exceptionally high levels of pitch variability. While the raw data paint a fairly erratic development, the moving window averages indicate a considerable increase in pitch variability from the moment 2Pac broke ties with the East Coast hip-hop scene and aligned himself with Death Row Records. A Pearson correlation analysis supports this interpretation of Figure 5.3, as it found a large, statistically significant positive correlation between degree of pitch variability in rap and time, $r(26) = .631$, $p = .009$.

To test the hypothesis that 2Pac's rapping would be considerably more melodically variable during his tenure at Death Row Records than before, a one-sided independent samples *t*-test was performed. 2Pac's rapping was found to have an average pitch fluctuation slope of 0.341 semitones per every 10 ms (*SD* = 0.046) before he was signed to Death Row Records, and an average pitch fluctuation slope

Figure 5.3. Development of 2Pac’s pitch variability (average delta pitch values per 10 ms) in rap, presented per quarter. Dark gray bars represent 2Pac’s pre-Death Row Records era; light gray bars represent 2Pac’s Death Row Records era. The bar for 1994’s third quarter represents the average delta value for two songs recorded during that quarter. From the fourth quarter of 1994 onward, bars indicate average delta values for three songs of that period. All other bars represent average delta values for a single song. Moving window averages (based on both three-quarter and five-quarter periods) are presented alongside West and East Coast baselines as reported by Gilbers et al. (2019a).

of 0.398 ($SD = 0.047$) while he was signed to Death Row Records. This was a significant difference with a large effect size, $t(26) = 32.195$, $p = .003$, $d = 1.226$. As such, the results support the second hypothesis. The pitch contour plots in Figure 5.4 illustrate the difference in degree of pitch fluctuation between 2Pac’s pre-Death Row Records era and the Death Row Records era; the pre-Death Row excerpt’s (Figure 5.4A) peaks, valleys, and pitch slope magnitude are visibly less extreme than the Death Row era excerpt’s (Figure 5.4B).

5.3.3 Rhythm

5.3.3.1 Rhythm – Speech prosody

This subsection deals with how 2Pac’s degree of rhythmic fluctuation in speech developed over time. As such, it is linked to the third hypothesis of the study, i.e., that 2Pac’s speech would be characterized by increasing levels of rhythmic variability over time and that his speech would be markedly more rhythmically diverse during his stint at Death Row Records than before. Figure 5.5 presents the

Figure 5.4. (A) Rap pitch contour example from 2Pac’s pre-Death Row era – “I wonda if heaven’s got a ghetto” (1992-05 (Q2); verse 1, excerpt): “The little young nigga doing bad shit / Talk much shit, ‘cause I never had shit / I could remember being whooped in class / And if I didn’t pass, mama whooped my ass / Was it my fault papa didn’t plan it out? / Broke out, left me. . .”; and (B) rap pitch contour example from 2Pac’s Death Row era – “Starin’ through my rear view” (1996-01-12 (Q1); verse 2, excerpt): “Now, I was raised as a young black male / In order to get paid, forced to make crack sales / Caught a nigga, so they send me to these overpacked jails / In a cell, counting days in this living black hell, do you feel me? / Keys to ignition. . .”

results from this investigation, plotting how 2Pac’s rhythmic variability in speech developed between 1988 and 1996.

Figure 5.5 shows a clear pattern of increasing levels of rhythmic variability over time for 2Pac’s speech in terms of nPVI. His nPVI scores start off near the East Coast AAE baseline reported by Gilbers et al. (2019a) and gradually grow towards the West Coast AAE baseline, reaching that point by 1994. A subsequent surge in nPVI levels can be observed once 2Pac has signed to Death Row Records: during the last year of his life, 2Pac’s speech becomes even more stress-timed, at times even exceeding the highest nPVI levels observed for the West Coast AAE speakers analyzed in Gilbers et al. (2019a): the lowest observed nPVI value for their West Coast speakers was Kendrick Lamar’s nPVI score of 59.653, and the highest one was Nipsey Hussle’s nPVI score of 69.277. In comparison, 2Pac overshoots that “target range” in three of the six interview recordings analyzed for his Death Row era, reaching nPVI values as high as 75.595 (see Appendix Table 5.1 to see all nPVI values we observed for 2Pac). This visual interpretation of Figure 5.5 is supported

Figure 5.5. Development of 2Pac’s rhythmic variability in speech (nPVI), presented per quarter. Dark gray bars represent 2Pac’s pre-Death Row Records era; light gray bars represent 2Pac’s Death Row Records era. From 1995’s fourth quarter onward, bars reflect the average delta value for two interviews from that quarter; the bars before represent delta values for single interviews. Moving window averages (based on both three-quarter and five-quarter periods) are presented alongside West and East Coast baselines as reported by Gilbers et al. (2019a).

by a Pearson correlation analysis, which found a large, statistically significant positive correlation between degree of rhythmic variation in speech (in terms of nPVI) and time, $r(14) = .727, p = .001$.

To test the hypothesis that 2Pac’s speech would be considerably more stress-timed during his tenure at Death Row Records than before, a one-sided independent samples *t*-test was performed. 2Pac’s speech rhythm was found to exhibit an average nPVI level of 58.919 ($SD = 4.014$) before he was signed to Death Row Records, and an average nPVI level of 69.656 ($SD = 5.265$) while he was signed to Death Row Records. This was a significant difference with a large effect size, $t(14) = -4.620, p < .001, d = 2.294$. As such, the results support the third hypothesis.

Figure 5.6 shows a strong pattern of increasing levels of rhythmic variability across utterances over time for 2Pac’s speech in terms of CV. As was the case for the nPVI measurement, 2Pac’s CV scores start off near the East Coast AAE baseline reported by Gilbers et al. (2019a) before gradually growing towards the West Coast AAE baseline, first reaching that baseline by 1994. No subsequent surge in nPVI levels can be observed once 2Pac had signed to Death Row Records, but during the

Figure 5.6. Development of 2Pac's rhythmic variability in speech (CV), presented per quarter. Dark gray bars represent 2Pac's pre-Death Row Records era; light gray bars represent 2Pac's Death Row Records era. From 1995's fourth quarter onward, bars reflect the average delta value for two interviews from that quarter; the bars before represent delta values for single interviews. Moving window averages (based on both three-quarter and five-quarter periods) are presented alongside West and East Coast baselines as reported by Gilbers et al. (2019a).

last year of 2Pac's life, the development of his rhythmic variability across whole utterances appears to stabilize. A Pearson correlation analysis supports this interpretation of Figure 5.6, as it found a large, statistically significant positive correlation between degree of rhythmic variation in speech (in terms of CV) and time, $r(14) = .631, p = .009$.

To test the hypothesis that 2Pac's speech would be considerably more rhythmically variable across utterances during his tenure at Death Row Records than before, a one-sided independent samples t -test was performed. 2Pac's speech rhythm was found to exhibit an average CV level of 0.540 ($SD = 0.055$) before he was signed to Death Row Records, and an average CV level of 0.618 ($SD = 0.031$) while he was signed to Death Row Records. This was a significant difference with a large effect size, $t(14) = -3.149, p = .004, d = 1.747$. As such, the results support the third hypothesis.

5.3.3.2 Rhythm – Rap flows

This subsection deals with how 2Pac's degree of rhythmic fluctuation in rap developed over time. As such, it is linked to the study's fourth hypothesis, i.e., that 2Pac's rap flows would be characterized by increasing levels of rhythmic variability over time and that his rapping would be markedly more rhythmically diverse during his stint at Death Row Records than before. Figure 5.7 presents the results from this investigation, plotting how 2Pac's rhythmic variability in rap (in terms of CV) developed between 1988 and 1996.

While for speech, increasing levels of rhythmic variability over time could be observed, Figure 5.7 shows that 2Pac's rapping did not develop in the same way in terms of rhythm. The development of 2Pac's rhythmic variability across rap verses is erratic and, contrary to what was hypothesized, it is characterized by a downward rather than an upward trend. This interpretation of Figure 5.7 is supported by a Pearson correlation analysis, which found a moderate, statistically non-significant negative correlation between degree of rhythmic variation in rap (in terms of CV) and time, $r(26) = -.320$, $p = .127$.

To test the hypothesis that 2Pac's rapping would be more rhythmically variable across utterances during his tenure at Death Row Records than before, a one-sided independent samples *t*-test was performed. 2Pac's rapping was found to exhibit an average rhythmic CV level of 0.467 ($SD = 0.059$) before he was signed to Death Row Records, and an average CV level of 0.440 ($SD = 0.035$) while he was signed to Death Row Records. This was a non-significant difference with a medium effect size, $t(22) = 1.366$, $p = .093$, $d = 0.557$. As such, the results do not support the hypothesis that his rapping would become more rhythmically variable across verses.

5.3.3.2.1 Rhythmic heat maps

The fourth hypothesis also stipulated that 2Pac's rapping would exhibit increasing levels of rhythmic variability over time in terms of which notes he tended to use in his bars. This part of the hypothesis was based on Gilbers et al. (2019a)'s finding that West Coast rap flows were more variable than East Coast rap flows in this respect. To test this hypothesis, we examined the rhythmic "heat map" visualizations of which 64th notes of a bar 2Pac used most often on average visualized in Figure 5.8. In these rhythmic heat maps, musical bars are divided into a grid of 64th notes, and depending on how often the rappers' notes (i.e., syllables) were performed within the temporal boundaries of these individual boxes on the grid, the boxes are colored relatively light or dark (for relatively little usage and relatively frequent usage respectively). Figure 5.8A shows such maps for the

Figure 5.7. Development of 2Pac’s rhythmic variability (CV) in rap, presented per quarter. Dark gray bars represent 2Pac’s pre-Death Row Records era; light gray bars represent 2Pac’s Death Row Records era. The bar for 1994’s third quarter represents the average CV value for two songs recorded during that quarter. From the fourth quarter of 1994 onward, bars indicate average CV values for three songs recorded during that period. All other bars represent average delta values for a single song. Moving window averages (based on both three-quarter and five-quarter periods) are presented alongside West and East Coast baselines as reported by Gilbers et al. (2019a).

individual songs in the pre-Death Row period, Figure 5.8B does so for the individual songs in the Death Row period, and Figure 5.8C offers average heat maps for these two periods.

From the heat maps in Figure 5.8, it can be observed that, in terms of rhythm, 2Pac clearly did not let himself be defined by a single flow throughout his career, as many different patterns can be observed, with 64th notes that are highly common in some songs being nearly absent in others. For instance, 2Pac regularly uses the first beat of the bar in most of the verses that were analyzed, but largely ignores it in songs like “Old school” (from September 28, 1994) and “Enemies with me” (from October 1994). Moreover, he uses the third to last 16th note (i.e., 64th note number 53 in the heat map plots) all the time in songs like “Out on bail” (from October 1993) and “Me against the world” (from September 29, 1994), but rarely uses it in much of his other work.

No clear, linear pattern towards a different style of timing can be observed from looking at the individual verses’ heat maps, but the average heat maps for 2Pac’s

5.4 Discussion

5.4.1 Results

In this section, we will first discuss the results of the study in light of the separate hypotheses we formulated in section 5.1.6. Subsequently, we will explore how 2Pac, as he has publicly stated himself, regularly employed the process of immersion and method acting to make his music and acting more believable, and how this could possibly be related to certain trends we can observe in the development of his speech prosody and rap flows.

5.4.1.1 Melody

5.4.1.1.1 Melody – Speech prosody

Regarding melodic variation in speech prosody, we hypothesized that 2Pac's speech would show increasing levels of pitch variation, and that, on average, his Death Row period would be marked by significantly greater pitch variation than his pre-Death Row period. The results did not provide clear support for this hypothesis: while his melodic variation was on par with East Coast AAE norms at our first point of observation (1988's fourth quarter) and on par with West Coast AAE norms for our last quarter of observation (1996's third quarter), the development in between proved to be highly erratic. Such erratic development over time could perhaps be reflective of his linguistic system being highly unstable because he moved to another dialect region, something which would be predicted from a Complex Dynamic Systems Theory perspective. In light of this, it is interesting to note that Gilbers (2015, 2018a) made a similar observation with regards to the development of 2Pac's /æ/ vowel duration, attributing the increased levels of vowel duration variation to 2Pac's linguistic system growing increasingly unstable as time progressed. Regardless, at most we can observe a general trend towards greater melodic variation over time, but a direct comparison of pitch variability averages for the pre-Death Row period and the Death Row period show no statistically significant differences.

A possible (yet highly speculative) explanation as to why 2Pac's pitch variability did not clearly grow as we hypothesized it would is that a ceiling effect may have occurred as a result of his average pitch levels being higher in the later recordings. After having been shot five times, spending nearly a year in prison, and feeling betrayed by the East Coast hip-hop community, we got the impression from the interviews that 2Pac had a strong desire to air out his grievances and that he was, generally speaking, more emotional, angrier, and more upset during these interviews

than he was in the pre-Death Row period. Higher emotional arousal levels tend to be correlated with higher average vocal pitch,⁵⁸ and we can see this for 2Pac as well: during the Death Row period, his average pitch was over 3 semitones higher than during the pre-Death Row period, namely 17.140 ($SD = 3.647$) on our semitone-based scale compared to 13.999 ($SD = 1.756$). In fact, the Death Row period includes several individual interview recordings where 2Pac's average pitch was nearly an octave higher than in some of the pre-Death Row period recordings. The reason why this could have potentially had an effect on 2Pac's pitch variability levels is that speakers' pitch ranges are not unlimited: at some point, the vocal folds simply cannot vibrate any faster. As such, the distance between 2Pac's average vocal pitch and the upper edge of his pitch range was closer in the later interviews when 2Pac was more emotional than it was in the calmer interviews during the pre-Death Row period, meaning he had less "real estate" to work with in terms of upward pitch inflection. Future research, perhaps using different 2Pac interview recordings, needs to be conducted in order to see if there is any merit in this explanation, but until those studies have been conducted, we have to conclude that the results do not offer clear support for our hypothesis.

5.4.1.1.2 Melody – Rap flows

Regarding melodic variation in rap flows, we hypothesized that 2Pac's rapping would be characterized by increasing levels of pitch variation, and that, on average, his flows from the Death Row period would be marked by significantly greater pitch variation than his flows from the pre-Death Row period. The results support this hypothesis, as a clear trend of increasing melodic variation was observed. Moreover, the songs analyzed for the Death Row period exhibited significantly more pitch variability than the songs analyzed for the pre-Death Row period. From the data, it seems clear that 2Pac's signing to Death Row Records marked a clear turning point in the way that he used pitch variation in his music. The data also show that he regularly "overshot" the norms for melodic variation in West Coast rap flows during the Death Row period – something which only happened occasionally in his work from the pre-Death Row period – which would suggest that he actively manipulated his pitch while rapping to sound hyper-West Coast, even more West Coast-like than his peers who were actually born there.

⁵⁸ For a more in-depth discussion of the relationship between emotional arousal levels and average pitch, see, for example, Gilbers et al. (2015).

5.4.1.2 Rhythm

5.4.1.2.1 Rhythm – Speech prosody

With regards to rhythmic variation in speech, the study's results clearly offer support for our hypothesis that 2Pac's speech would become more rhythmically variable over time, especially when comparing his speech from the Death Row period to his speech from before. Regarding overall rhythmic variation (measured in terms of CV for syllable duration), 2Pac shows a clear pattern of growing rhythmic variability which seems to stabilize along the West Coast AAE baseline as reported by Gilbers et al. (2019a) during his tenure at Death Row Records. In terms of rhythmic variation along the stress-timed/syllable-timed continuum, the development of 2Pac's speech is even more extreme, marked by early stability along the East Coast AAE baseline before gradual development towards West Coast AAE norms sets in, followed by an increased rate of change in the final year of 2Pac's life. During the Death Row period, he shows extreme instances of overshooting compared to his West Coast peers. In fact, in the last 2Pac interview that we analyzed, which was recorded 11 days before he would be fatally shot in Las Vegas, 2Pac exhibits his most stress-timed speech of our corpus, far exceeding the upper range of the West Coast AAE group analyzed in Gilbers et al. (2019a). While his extreme stress-timedness towards the end of his life could be interpreted as him simply not being able to "hit the target", a much more likely explanation would be that 2Pac was very much aware that West Coast AAE is more rhythmically variable than East Coast AAE, and that he used his speech rhythm to position himself as being even more West Coast than his peers in order to justify his role as the leader of the West Coast in the bicoastal hip-hop feud. The reason we would argue the latter interpretation is the more plausible one is that by late 1993 and 1994, 2Pac's nPVI levels had already comfortably stabilized right along the West Coast AAE baseline, suggesting he had already "acquired" the second dialect's norms for rhythmic variation by then.⁵⁹ In section 5.4.1.3, we provide further evidence for our interpretation that 2Pac made a conscious effort to manipulate his speech during the last year of his life.

⁵⁹ We use "acquisition" here to indicate that 2Pac exhibited native-like performance (i.e., that his speech fit in with the rhythmic variation norms of the West Coast AAE speech community as defined by Gilbers et al., 2019). For a more in-depth discussion of the varying views on what it entails for a second dialect learner to truly "acquire" a second dialect feature, please see Siegel (2010).

5.4.1.2.2 Rhythm – Rap flows

Regarding rhythmic variability, we did not observe a trend of increasing variation in 2Pac's rap flows across verses based on the duration of note intervals. In fact, we observed a downward trend, meaning that his rap flows became less rhythmically variable over time. As such, the results completely contradict our hypothesis on rhythmic variability in terms of note interval length. This was a surprising finding, especially considering that 2Pac's speech had grown extremely more rhythmically variable over time, and we do not have a clear explanation of why this was the case.

2Pac's rap flows may not have become more rhythmically variable in terms of CV values based on note interval length, but that does not mean that his rapping did not become more rhythmically variable. The concept of rhythmic variability comprises many different facets, note interval length-based CV scores being but one of them. Another dimension of rhythmic variability is related to which notes rappers tend to use in their bars. Interestingly enough, 2Pac's average heat maps for the Death Row period were found to be more variable than those of his pre-Death Row period. The higher degree of variation observed for the Death Row period is reminiscent of the ways in which Gilbers et al. (2019a) found the average West Coast rap flow heat maps to be more rhythmically diverse than the average East Coast rap flow heat maps of their study. In Figure 5.9, these average rap flow heat maps for the West and East Coast found by Gilbers et al. (2019a) are reprinted (Figure 5.9A) alongside 2Pac's average rap flow heat maps from the pre-Death Row period and the Death Row period (Figure 5.9B).⁶⁰ Note distribution for West Coast rap was found to be more spread out than for East Coast rap, with fewer dark-colored 64th note boxes in the grid and more boxes filled with intermediate colors on the grayscale gradient. East Coast rappers, on the other hand, strongly gravitate towards a specific subset of notes on the grid, using the other notes on the grid only sporadically: they focus on each 8th note (i.e., boxes 1, 9, 17, 25, 33, 41, 49, and 57 on the 64th note grid). If we compare 2Pac's average heat maps, we see that in his pre-Death Row period, there are more dark-colored 64th note boxes in the grid than for the Death Row period, which has more boxes filled with intermediate colors on the heat maps' grayscale gradient. As such, 2Pac's Death Row flow gravitated less towards a specific subset of notes than his pre-Death Row flow, much like the average West Coast rap flow gravitates less towards a specific subset of notes than

⁶⁰ Figure 5.9B is identical to this article's Figure 5.8C, reprinted here to allow for better comparison with the West Coast and East Coast baseline rap flow heat maps from Gilbers et al. (2019a).

variable over time, the results are mixed. While his flows actually became less rhythmically variable regarding note interval duration, they did become more rhythmically variable and more West Coast-like with regards to which notes in a bar 2Pac tended to use. As such, the results partly support our fourth hypothesis. They also show that it is important to realize that rhythm is a multidimensional concept, that the development of variability in those separate rhythmic dimensions may or may not follow the same patterns, and that there may be many more aspects to rhythm than we have considered thus far.

5.4.1.3 2Pac's changing prosody and flow and the language-music connection

This study's fifth, overarching hypothesis – which was based on the idea that language and music are closely connected, as was seen in previous work by, among many others, Patel et al. (2006) for more traditional styles of music (e.g., classical music) and by Gilbers et al. (2019a) for the specific context we are examining in this study – was that regarding melodic and rhythmic variability, the diachronic development of 2Pac's rap flows would have followed the same pattern as the diachronic development of his speech prosody. The first matter that should be noted in light of this is that both 2Pac's prosody and his flow changed over time, becoming more West Coast-like. As such, this study provides the first evidence that migrating to another region may result in not only linguistic accommodation, but in musical accommodation as well. In other words, the results validate the decision to conduct a case study on an individual's naturalistic acquisition of a second regional *musical* dialect.

Regarding a possible language-music connection, the overall picture is somewhat cloudy. 2Pac's speech clearly became more West Coast-like in terms of rhythmic variation, but we did not observe any significant changes in terms of melodic variation. His rapping, on the other hand showed mixed results regarding rhythmic variation – the heat maps suggest that he definitely accommodated to West Coast rap's norms of greater rhythmic variation, but in terms of note interval duration we found no evidence of this at all – while the melodic variation results do overwhelmingly support our hypothesis. It is worth noting here that for language as well as for music, it appears that both passive and active processes are involved when accommodating towards the new region's norms. Both 2Pac's speech and flow exhibit gradual changes towards West Coast norms, and considering his circumstances at the time, it seems likely that this was in great part due to increased exposure to the new region's norms, not due to any mentionable conscious efforts

made by 2Pac. However, 2Pac also appears to have been able to consciously manipulate his speech *and* his rapping to sound more West Coast-like when external circumstances provided him an incentive to do so, as we see evidence of increased rates of change as well as overshooting effects, much like Gilbers (2015, 2018a) found for the development of 2Pac's vowel duration.⁶¹

To conclude, the results of our study provide evidence for the language-music connection being involved in SDA, but this evidence is far from definitive. Likely, there are a myriad of other factors involved here, which we have only been able to account for partially and which we have not been able to control for in the design of the study. Future research could hone in on these other factors involved, for instance by controlling for emotional state in interviews more (supposing this is possible), by looking at a larger corpus to get an even better idea of 2Pac's changing speech and rapping, or by doing a case study on a different individual entirely.

5.4.2 2Pac's method acting

In the sections above, we have stated several times that the results of our study suggest that 2Pac, once he signed to Death Row Records and became West Coast hip-hop's primary figurehead in the East Coast/West Coast hip-hop war, made a conscious effort to sound extra West Coast-like, both in his speech and in his music. We based these claims on our observations that 2Pac's rate of change towards West Coast norms increased from late 1995 onward for some of the variables we looked at, and on the observation that 2Pac regularly overshot the West Coast targets for high rhythmic and melodic variability when he had previously been performing on a native-like level already. Moreover, 2Pac's overshooting of the targets as observed in this study should be viewed in the context of Gilbers's (2015, 2018a) study on the diachronic development of 2Pac's /æ/ vowel duration, which also revealed overshooting effects in the final year of 2Pac's life.

However, this idea that 2Pac made a conscious effort to manipulate his speech and flow is also supported by extralinguistic evidence that 2Pac himself has provided in an interview with James Spady published in Spady, Alim, and Lee (1999). In this interview, 2Pac was asked about his preparation for movie roles, and tells the interviewer that he likes to take a method acting approach:

⁶¹ In section 5.4.2, we elaborate on 2Pac's allegedly conscious attempts at manipulating his speech and his rapping, connecting our findings to what 2Pac himself has said about his approach to writing music and acting in motion pictures.

I go to neutral. (...) And I study the character. Whatever it is, I study it. Like, if it is a rap or whatever, it's all about living it. I find out who that is and I clone them. I become him. I start breathing and thinking like him and everything. So with *Juice*, I just threw myself in the streets. With Lucky⁶² (...), I just threw myself around that L.A. crowd. Learned the language. Learned the culture. By the end of the film, I knew each gang, where the sets were. That was because I just threw myself in it. Even though it wasn't nothing about gangs in the movie. But it was just so I knew for myself.” (p. 563)

2Pac makes a few remarks here that we believe are key to understanding what happened to his accent and flow towards the end of his life. First of all, 2Pac states that he not only likes to take a method acting approach in preparation for movie roles, but that he likes to take such an approach when writing his music as well, probably to make the stories he tells in his music more compelling and believable. Secondly, he specifically states that his method acting approach involves him truly immersing himself in the target speech community in order to soak up their culture and really learn how they speak.

Taking these comments into account sheds a different light on 2Pac's behavior from late 1995 onward. Once he got out of jail in the Fall of 1995 and signed to Death Row Records, 2Pac – who was a millionaire that owned a 6000-square-foot mansion in a wealthy area of Woodland Hills near Calabasas, California – hung out in the impoverished city of Compton with Piru Blood gang members who were affiliated with Suge Knight on an almost daily basis. In other words, he truly immersed himself in the Los Angeles hip-hop community that he wanted to belong to and represent, meaning that his method acting preparations were not limited to the roles he played on the big screen; he method acted in preparation for a role that he wanted to play in the real world as well: the persona of the ultimate West Coast gangsta rapper. As such, we believe it is relatively safe to assume that the overshooting effects and increased rates of accommodation towards West Coast norms that we observed in 2Pac's speech and rapping during the final year of his life are not indicative of, for example, him not having fully acquired the second dialect region's norms yet. Rather, we would argue that they were the result of a conscious effort made by 2Pac to sound more like a West Coaster or to even have his speech and rapping come across as being hyper-West Coast, like he was a West

⁶² Lucky is the name of the character that 2Pac played in the movie *Poetic Justice*.

Coast gangsta rapper on steroids. The strategy worked – 2Pac has widely become accepted as one of the most notable rappers in West Coast hip-hop history – but came at the cost of his life, as 2Pac’s involvement with Los Angeles gang politics likely led to his murder.

5.4.3 Conclusion

To conclude, this study looked at the rapper 2Pac’s acquisition of a second linguistic regional dialect and a second musical regional dialect in light of his migration from the East Coast of the United States to the West Coast and his later involvement with the infamous East Coast/West Coast hip-hop war of the mid-1990s. Specifically, we analyzed the development of rhythmic and melodic variability in his speech prosody and in his rap flows, with a particular interest in seeing whether rhythmic and melodic variability would develop in similar ways for speech and rap. While 2Pac’s speech and his rapping did not develop as we hypothesized they would for all of the variables we investigated, the results do support the majority of our hypotheses of development towards the target region norms (i.e., increasing rhythmic and melodic variability) over time. Moreover, the results suggest that 2Pac’s accommodation towards the linguistic and musical norms of the West Coast involved both passive and active processes: once he had a clear incentive to sound more like a West Coaster in his speech and music, his speech and rapping exhibited faster rates of accommodation towards West Coast norms and regular instances of him overshooting the target (i.e., speaking or rapping with even greater levels of melodic/rhythmic variation than his peers), findings that are reminiscent of those of a previous case study on 2Pac’s accent change conducted by Gilbers (2015, 2018a). The idea that 2Pac made a conscious effort to sound more West Coast-like towards the end of his life is corroborated by external evidence, as 2Pac himself has stated method acting is his go-to approach for writing music and acting, specifically mentioning how he would immerse himself in speech communities to absorb their culture and learn their language/way of speaking. Overall, the results show us that both 2Pac’s speech and his music were affected by his migration to another dialect region, and that the changes in both domains follow a similar pattern for the most part. Since the hypotheses were not supported across the board, however, 2Pac’s linguistic and musical development needs to be examined in even greater detail, either by looking at additional data or by examining other linguistic or musical variables. Doing so would hopefully expand our knowledge of not just what happened to 2Pac’s speech and rapping, but also our knowledge of exactly how strong the language-music connection may truly be in the context of SDA.

5.5 Appendix

Appendix Table 5.1. Overview of melodic and rhythmic variability data collected for 2Pac's prosody (presented individually for each recording analyzed).

Interview date	Pitch	Rhythm	
	Δ per 10 ms (semitones)	nPVI	CV
1988 (Q4)	0.263	55.937	0.509
1989-09 (Q3)	0.289	56.606	0.572
1991-11 (Q4)	0.312	57.844	0.521
1992-02-02 (Q1)	0.319	56.034	0.473
1993-07-19 (Q3)	0.295	52.746	0.471
1993-10-28 (Q4)	0.279	57.985	0.489
1994-03-09 (Q1)	0.305	64.314	0.598
1994-09-26 (Q3)	0.301	65.434	0.567
1994-10-15 (Q4)	0.365	61.801	0.564
1995-09-20 (Q3)	0.290	60.487	0.634
1995-10-19 (Q4)	0.239	62.186	0.597
1995-10-26 (Q4)	0.234	75.595	0.648
1996-04-19 (Q2)	0.333	69.123	0.643
1996-05-04 (Q2)	0.244	65.490	0.572
1996-08-24 (Q3)	0.333	70.480	0.608
1996-08-27 (Q3)	0.292	75.061	0.640

Appendix Table 5.2. Overview of melodic and rhythmic variability data collected for 2Pac's flow (presented individually for each recording analyzed).

Rec. date	Song title	Pitch	Rhythm
		Δ per 10 ms (semit.)	CV
1998-03 (Q1)	I saw your girl	0.340	–
1991-10 (Q4)	Crooked nigga too	0.419	0.489
1992-03 (Q1)	Let them thangs go	0.265	–
1992-05 (Q2)	I wonda if heaven's got a ghetto	0.274	0.453
1992-09 (Q3)	N.I.G.G.A.	0.379	0.483
1992-12 (Q4)	Holler if ya hear me	0.400	0.473
1993-04 (Q2)	Thug 4 life	0.328	0.510
1993-09 (Q3)	Hellrazor	0.349	–
1993-10 (Q4)	Out on bail	0.337	0.465
1994-01 (Q1)	The uppercut	0.319	–
1994-05 (Q2)	Fuck all y'all	0.323	0.414
1994-09-28 (Q3)	Old school	0.331	0.530
1994-09-29 (Q3)	Me against the world	0.280	0.336
1994-10 (Q4)	Enemies with me	0.404	0.407
1994-11 (Q4)	Thug style	0.381	0.547
1994-11-30 (Q4)	The heat (Representin' 4 Ron G)	0.329	0.496
1995-10-27 (Q4)	Komradz (So so crazy)	0.390	0.449
1995-11 (Q4)	Letter 2 my unborn	0.310	0.455
1995-12-14 (Q4)	NY '87	0.448	0.446
1996-01-12 (Q1)	Starin' through my rear view	0.451	0.440
1996-02-19 (Q1)	Until the end of time	0.357	0.503
1996-03-29 (Q1)	Hit 'em up	0.379	0.429
1996-04 (Q2)	Um dumpin'	0.423	0.400
1996-05 (Q2)	Don't go to sleep	0.415	0.468
1996-06 (Q2)	Fright night (Whatcha gonna do?)	0.430	0.420
1996-07 (Q3)	Niggaz nature	0.361	0.405
1996-08 (Q3)	One day at a time	0.354	0.484
1996-09-06 (Q3)	Letz get it on (Ready 2 rumble)	0.464	0.380

GENERAL DISCUSSION

“Starin’ at the world through my rear-view. Just lookin’ back at the world from another level, you know what I mean?”

– Tupac Shakur (“Starin’ through my rear view”)

The studies discussed in this hip-hop linguistics doctoral dissertation all revolve around regional variation in speech (both in terms of speech production and speech perception), regional variation in rap flows, the language-music connection, and the acquisition of a second linguistic or musical dialect. All of these were studied in a context in which great importance is attached to representing one's regional identity and affiliation, namely the context of AAE and hip-hop, specifically for the West Coast and East Coast regions of the United States. Below, some of the most salient findings from these studies are reiterated divided into three different categories, tying them all together in the process. This is followed by a general discussion of the various theoretical frameworks and methodological approaches that were used for the present PhD project. Finally, on a metalevel, it will be discussed what the present PhD project can tell us about the value of conducting interdisciplinary, out-of-the-box research, and the influence 2Pac has had on my own work in this sense.

6.1 Discussion of findings, theory, and methodology

6.1.1 Regional variation in West Coast and East Coast AAE speech

At the foundation of this dissertation lie its dialectological findings with regards to the differences between West Coast and East Coast AAE speech, as these have shaped many of the project's other hypotheses and analyses. The variables that were acoustically investigated in this respect were vowel duration, variability regarding prosodic melody, and variability regarding prosodic rhythm. Chapter 2's study revealed that /æ/ vowel duration was significantly longer for the West Coast AAE accent than for the East Coast AAE accent. Chapter 3's results indicated that West Coast AAE was characterized by a greater degree of pitch variability compared to East Coast AAE. They also showed that West Coast AAE had markedly more rhythmic variation, both on the stress-timed/syllable-timed spectrum and across entire statements. Chapter 4 reports on a study that investigated the differences between West and East Coast AAE from a speech perception perspective. 306 US-based, English-speaking listeners were asked to distinguish between speakers of West and East Coast AAE involved with hip-hop on the basis of speech recordings alone. They were also asked to note which accent features they were paying most attention to while trying to decide where a speaker was from. The most reported accent features were prosody-related, but participants who listed at least one segmental difference between the dialects were more accurate on average than those who had not. Despite the fact that we saw several instances of participants

describing the differences between West and East Coast AAE in a way that contradicted the findings of our acoustic analyses, our participants were found to be able to distinguish between speakers of West and East Coast AAE better than chance. In other words, listeners can tell the difference between the two regiolects, but they may not necessarily consciously know how they are able to do this.

6.1.2 Regional variation in West Coast and East Coast rap and the language-music link in an AAE/hip-hop context

Chapter 3 not only reported on the differences between West Coast and East Coast AAE speech prosody with regards to rhythmic and melodic variation, it also discussed how West Coast and East Coast rap flows are distinct from each other regarding rhythm and melody. The results of the study indicated that West Coast rap flows were more melodically variable than East Coast rap flows. To analyze rhythmic variation in rap, a novel, MIDI-based method for analyzing microtiming in rap was introduced. Using this method, strong evidence was found that West Coast rap performances exhibited higher levels of rhythmic variation than East Coast rap performances. As indicated by heat maps for average note distribution, it was also found that West Coast rappers exhibit more variation than East Coast rappers regarding which parts of a musical bar they tend to use.

Since Chapter 3's study investigated regional variation regarding melodic and rhythmic variation in both speech and rap, it connects this dissertation to the literature on a possible connection between language and music, adding a new, AAE/hip-hop centric perspective. We found similar patterns of regional variation for prosody and rap (i.e., higher degrees of rhythmic and melodic variation for West Coast AAE compared to East Coast AAE as well as higher degrees of rhythmic and melodic variation for West Coast rap flows compared to East Coast rap flows), meaning that a connection between language and music could be observed even in the context of only subtly different regiolects of a single language variety. As such, the data offer additional support for the idea that the domains of language and music are intricately connected.

6.1.3 The development of 2Pac's accent and flow

The starting point, end point, and common thread of this PhD project is its diachronic case study on 2Pac's acquisition of a second linguistic and musical dialect. 2Pac's move from the East Coast to the West Coast at the age of 17 and his

later involvement in the East Coast/West Coast hip-hop conflict formed the inspiration for the entire project, and it is the reason I decided to investigate regional variation in West Coast and East Coast AAE, how well listeners can perceive the differences between these dialects, and how all of this could be related to the differences between West Coast and East Coast rap flows.

The case study's first part is discussed in Chapter 1, which deals with the duration of 2Pac's /æ/ vowels and describes how these gradually moved away from East Coast AAE norms towards the comparatively longer vowels of West Coast AAE (see Chapter 2) following his move from the East Coast to California. This process of gradual accommodation also involved an increase in vowel duration variation, suggesting that as a result of 2Pac's increased exposure to a non-native regiolect, his language system became increasingly unstable. The accommodation process was not entirely gradual, however. During the last year of his life, when 2Pac distanced himself from his East Coast roots and aligned himself more strongly with West Coast hip-hop (as evidenced by the content of his lyrics and comments in interviews), a much more rapid vowel duration increase could be observed in his speech with a few instances of 2Pac even overshooting the West Coast target norms. It was concluded that this could indicate that 2Pac made a conscious effort to sound more like someone from the West Coast in order to match his accent to the regional identity he was trying to portray.

Chapter 5 expands the case study reported on in Chapter 1 in multiple ways. For one, it adds suprasegmental features into the mix, looking at 2Pac's changing variability levels with regards to prosodic melody and rhythm. The study also deals with 2Pac's acquisition of a second musical dialect by looking at what happened to his rap flows in terms of rhythmic and melodic variation. On top of that, the scope of the study was increased substantially, with much more data being analyzed using a much higher temporal resolution (whenever possible, his second dialect acquisition was observed on a quarterly or even monthly basis rather than on a yearly basis). The hypotheses of the study were mainly inspired by the findings reported in Chapter 1 and Chapter 3: it was expected that a gradual process of accommodation towards West Coast norms for AAE speech and rap (i.e., towards higher levels of melodic and rhythmic variability) could be observed again, followed by accommodation towards these norms at an increased rate as well as instances of overshooting the West Coast targets. Barring some notable exceptions – 2Pac's speech did not exhibit higher levels of melodic variation over time, and regarding rap flows, increased rhythmic variability was only observed in terms of note distribution (which highlights the value of the MIDI-based method introduced

in Chapter 3 and the rhythmic heat maps it can generate) – the results of the study support the idea that 2Pac’s speech prosody and rap flows became more West Coast-like over time. Moreover, we see clear evidence that during 2Pac’s tenure at Death Row Records, he regularly overshot the West Coast targets for both speech and rap. These findings are in line with what we saw for /æ/ vowel duration in Chapter 1, supporting the notion that 2Pac really was trying to make a conscious effort to sound more like a West Coaster. Comments made by 2Pac himself (Spady, Alim, & Lee, 1999) corroborate this interpretation of the data, as he has stated that he used method acting to make sure his music and acting were believable, specifically describing how he purposely immersed himself in new speech communities to make their way of speaking his own.

When combined, the case studies of Chapter 1 and Chapter 5 show how acquiring a second linguistic and a second musical dialect may involve both passive and active processes, especially when this acquisition occurs in a cultural context where these regiolects are strongly linked to feelings of personal identity and regional affiliation. Indirectly, they also provide evidence to Chapter 3’s conclusions on the existence of a language-music connection, as 2Pac’s acquisition of a second linguistic dialect was characterized by a similar pattern of development as his acquisition of a second musical dialect.

6.1.4 Integration of theoretical perspectives and methodologies

The introductory chapter of this dissertation explicitly advocates for an interdisciplinary approach to conducting research, taking a first step at doing so by presenting an approach which integrates multiple theoretical perspectives – i.e., Exemplar Theory (ET), Complex Dynamic Systems Theory (CDST), and sociolinguistic work on speaker identity, motivation and more – to arrive at a more comprehensive theory of second dialect acquisition. The findings of this dissertation offer clear support for this integrated approach. ET is perfectly suited for predicting the direction of change on the basis of changing exposure levels. This was confirmed by the results from the two 2Pac case studies, which showed patterns of assimilation towards West Coast AAE accent norms for both prosody and vowel duration as 2Pac’s West Coast AAE exemplars gained more prominence in his cognitive system due to increased exposure to West Coast AAE. To predict rate of change, however, one needs a sociolinguistic interpretation of the (extralinguistic) context in which an individual acquires a second dialect. The value of taking such a perspective was apparent from both 2Pac case studies, as his rate of assimilation increased during

his tenure at Death Row Records for both prosody and vowel duration. Moreover, this sociolinguistic dimension allowed for the prediction and interpretation of the overshooting effects that could be observed in 2Pac's speech. CDST's focus on increased levels of variation as being a sign of a linguistic system in flux was especially useful in Chapter 1's study on 2Pac's vowel duration, which displayed higher levels of variability as time progressed and his language system became more unstable. This CDST perspective with its focus on variability levels was less suitable for Chapter 5's case study, however. The reason for this is that for the case study on prosody and rap flows, variability was the dependent factor in the analysis; the difference between West Coast and East Coast varieties is that the West Coast ones are more melodically and rhythmically variable, meaning that increased variability in 2Pac's prosody and flow was the goal, not the unintended byproduct of acquiring a new variety's features. In other words, it was impossible to tease apart which portion of the increased variation we could observe was due to 2Pac assimilating to West Coast norms and which portion of it was due to his linguistic system becoming destabilized. Based on the results from Chapter 1's case study on 2Pac's vowel duration, however, it seems reasonable to assume that the inclusion of a CDST perspective will prove insightful for the analysis of dependent variables that do not revolve around variation levels.

Next to the integration of ET, CDST, and sociolinguistic theory, this PhD project's inclusion of a musicological dimension further expands the predictive and analytical power of its theoretical framework. Not only did Chapter 3 show that the effects of the language-music connection can even be observed in a context of closely related regional varieties of the same sociolect, Chapter 5's findings showed that the intricate relationship between language and music plays a role in second dialect acquisition as well: when it comes to rhythmic and melodic variation, highly similar patterns of development can be observed for music and speech. The same applies to the project's inclusion of a perceptual component. Chapter 4's results provided the first quantitative evidence that the differences between West Coast and East Coast AAE are perceptually salient to listeners. They also show which accent features appear to be most salient to listeners, and that listeners may not always be correctly informed about the ways these accents are distinct from each other. Such information could be highly relevant for the prediction and interpretation of the results of future studies: if a learner of a given variety is likely to be unaware of what their target variety's accent characteristics are (or has incorrect beliefs about this), this will undoubtedly have an effect on the trajectory of their linguistic development. Of course, integrating theories from multiple, at times greatly

dissimilar fields brings along the integration of a diverse set of methodologies as well, as was definitely the case with this PhD project. Perhaps more importantly, however, it offers fertile ground for the development of novel approaches, which is a requirement for research to remain innovative. The way acoustic analysis software designed for speech analysis was used in this PhD project (i.e., by using it to analyze music) is a good example of this, as is the repurposing of technology designed to create music in order to analyze musical microtiming (i.e., the MIDI-based approach introduced in Chapter 3).

6.2 Final thoughts

This PhD project adds to the literature on regional variation in AAE, further solidifying the notion that AAE speech is regionally heterogeneous, both with regards to segmental and suprasegmental features. It also shows that AAE's West Coast and East Coast varieties are perceptually distinguishable. In addition, the project's results support the idea that hip-hop culture and AAE are intricately linked, corroborating claims made in the past by, for example, Morgan (1993, 1998, 2001, 2002) and Alim (2004, 2015), especially in light of hip-hop's focus on regional identity and affiliation. The influence of hip-hop's focus on regionality transcends the domain of language, as the project's case studies on 2Pac revealed how 2Pac manipulated his speech *and* his rapping in similar ways to associate himself with a different hip-hop region than he grew up in. The link between language and music in the AAE/hip-hop context teased in these case studies was further proven in the study on regional variation in West Coast and East Coast AAE prosody and rap flows. As such, the dissertation adds a new dimension to the work on similarities between language and music (e.g., Patel, Iversen, & Rosenberg, 2006) as well. In its entirety, this PhD project can be considered a showcase for the field of hip-hop linguistics' diversity, which will hopefully serve as an incentive for other researchers in linguistics, hip-hop studies, and musicology to join forces and explore what else is possible.

It is my strong conviction that the best, most innovative, and most valuable science comes from thinking outside the box and taking an interdisciplinary approach in the broadest interpretation of the phrase. This PhD project is a testament to that philosophy. I have combined insights from multiple theoretical perspectives (e.g., ET's ideas on accommodation through exposure, CDST's focus on variation as an indicator of instable, developing language systems, sociolinguistic ideas on speech adaptation in relation to feelings of personal identity), bridged the gaps between multiple fields of research (e.g., sociophonetic dialectology, second

language/dialect acquisition research, musicology, hip-hop studies, research on the language-music connection), investigated several distinct domains (e.g., speech production and speech perception, rhythmic and melodic variability, speech and rap), and used information from a diverse set of sources (e.g., research articles, biographies, interviews with hip-hop artists, and personal conversations with people of different races, genders, and sexualities from all over the world). Moreover, the studies reported on in this book, while all related to hip-hop linguistics in general and this project's central research questions at hand, required wildly different approaches and methodologies (e.g., acoustic duration and pitch measurements, lyrical analysis, accent perception surveys, and MIDI-based analysis of microtiming in rap flows). In fact, in order to be able to analyze microtiming in rap flows, I was forced to invent a new methodology completely from scratch, taking the tools I was already familiar with from producing music and recontextualizing them to analyze rather than produce music. I could not have answered the questions I wanted to if I had not taken such an interdisciplinary approach.

As a human being, 2Pac embodied this idea of interdisciplinarity. A true *homo universalis*, he was a rapper, an actor, a screenwriter, a dancer, a gangster, and a political activist who would hang out with Gianni Versace and Madonna one night, and with members of the Bloods on the streets of Compton, California the next. Whatever 2Pac did, he always took the road least traveled. In light of this, one quote of his during an interview with MTV's Abbie Kears, recorded on March 9, 1994, has always stuck with me:

I'm not saying that I'm going to rule the world, or I'm going to change the world. But I guarantee that I will spark the brain that will change the world. That is our job: it's to spark somebody else watching us.

His music and approach to life most certainly inspired me, and I hope that I can follow 2Pac's lead and inspire others with my work as well.

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BONUS CHAPTER

***How the financial crisis changed hip-hop**

* Slightly adapted from previously published chapter in *The sociolinguistics of hip-hop as critical conscience: Dissatisfaction and dissent* (Ross & Rivers, 2018).

Gilbers, S. (2018b). How the financial crisis changed hip-hop. In A. S. Ross & D. J. Rivers (Eds.), *The sociolinguistics of hip-hop as critical conscience: Dissatisfaction and dissent* (pp. 163-189). Houndmills, UK: Palgrave Macmillan.

8.1 Introduction: 'Talking about material things'

In early 2008, then-Senator Barack Obama remarked the following: "I love the art of hip-hop, [but] something I'm really concerned about is [that it's] always talking about material things." (Obama, 2008). Considering the state of hip-hop at the time, this is an understandable concern. Especially when looking at mainstream hip-hop, it was difficult to find rap music with lyrical content that did not revolve around expensive sports cars, luxurious mansions, extravagant designer clothes, gold teeth, diamond necklaces, and most of all money – obscene amounts of money. It is, therefore, not surprising that artists such as 50 Cent, Kanye West, and Lil Wayne dominated the charts with songs like "Straight to the bank" (2007), "Good life" (2007), and "A milli"⁶³ (2008) respectively, all of which were odes to money, materialism, and the luxurious lives only multimillionaires can afford. Rap lyrics were a sign of the times: in a period of economic prosperity, the richest in society were admired for their financial success (see, for example, the popularity of hypercapitalist television shows like MTV *Cribs* and *Pimp My Ride* during the 2000s), and music that embraced this attitude towards materialism was omnipresent and highly successful. When the financial crisis arrived in late 2008 as a result of Wall Street's greed and chronic mismanagement, however, public opinion on materialism and the pursuit of wealth changed drastically. Main Street no longer celebrated those who chased financial success at all costs but loathed them instead, the Occupy Wall Street movement emerged, and Barack Obama – who promised to bring change to Wall Street's avaricious culture – was elected president.

Having disproportionately held subprime mortgages during the pre-crisis housing boom, the African-American demographic was among the most severely affected by the crisis (Mui, 2012). Hence, it would not be unreasonable to assume the African-American community was not among Wall Street's greatest supporters at the time, nor would it be unreasonable to assume that sentiments of dissatisfaction with and dissent against Wall Street might have been expressed in African-Americans' primary cultural expression: rap music. Rappers have always used their lyrics to communicate the everyday social injustices experienced by African-Americans that are largely ignored by the mainstream media. However, a description of hip-hop as merely being African-Americans' 24-hour news channel is arguably too narrow: rappers do not just tell newsworthy stories of struggle and injustice, they rap about virtually anything they see around them. As a result, rap lyrics can be about any topic, ranging from block parties to drug dealing, from Los

⁶³ *Milli* is a slang expression meaning 'one million dollars'.

Angeles gang warfare to Atlanta strip clubs, and from family soul food dinners to exclusive parties on yachts. From this, it logically follows that when rappers' environments change, the topics they tend to address may change as well, as may the tone they use in doing so. This is illustrated by the observation that hip-hop went from being mostly upbeat and party-oriented to being primarily concerned with gritty gangster stories once African-American neighborhoods were introduced to the devastating effects of Reaganomics⁶⁴ and the crack epidemic⁶⁵ in the 1980s. Rappers also respond when they feel the situation in their community (i.e., the African-American hip-hop community) changes. Evidence for negative responses of this kind can be found in hip-hop's belligerent reaction to police brutality against African-Americans (e.g., the 1991 Rodney King beating and the recent murders of unarmed black men by white police officers). Furthermore, former President George W. Bush's "slow and uneven response to the leveling of a predominantly black city [New Orleans]" (Walters, 2015) due to Hurricane Katrina, which greatly affected African-Americans (Finley, 2015), not only prompted Kanye West to blurt out on live television that Bush did not care about black people (Strachan, 2015) but also sparked numerous critical songs such as Lil Wayne's "Tie my hands" (2008). Positive responses may also occur, as evidenced by rappers' overwhelmingly positive reaction to the election of America's first black president, for example on the 2008 song "My President is black (Remix)" by Young Jeezy and Jay-Z (2010), on which Jay-Z jubilantly raps that his "president is black but his house [is] all white."

Considering that rap lyrics have always reflected their authors' environments and that the African-American community was disproportionately affected by the financial crisis (Mui, 2012), the present chapter is concerned with answering the following research question: did the financial crisis change hip-hop's views on materialism and the pursuit of wealth as well as cause rappers to express dissent against materialism? This question is further divided into three subordinate questions, namely (1) whether the degree of materialism displayed in rap lyrics changed after the financial crisis's onset, (2) whether rappers, through their lyrics and other means, aligned themselves with activist movements against the culprits of

⁶⁴ 'Reagonomics' refers to Ronald Reagan's trickle-down economics, which "affected the poor, among whom [African-Americans] are disproportionately represented, more negatively than the rich" (St. Pierre, 1991).

⁶⁵ Crack, a cheaper, more addictive free base form of cocaine – became widespread in impoverished African-American communities so fast that its rapid increase in consumption and accessibility would later be referred to as the "crack epidemic" (Reinarman & Levine, 1997).

the financial crisis, and (3) whether the hip-hop community's views on materialism and the pursuit of material wealth correspond to rap lyrics' content as it changed over time. These subquestions will be addressed from a sociolinguistic discourse analysis perspective (i.e., by studying the interrelationship between language use in rap lyrics and society) through qualitative and quantitative analyses of rap lyrics from before and after the financial crisis's onset, focusing on the degree of materialism and anti-greed criticism they contain. Moreover, they will be answered through interviews with members of New York City's hip-hop community that were conducted during the summer of 2011, and that were also used to establish some historical context to hip-hop's materialism as described above.

8.1.1 The origins of rap's materialism

As the introduction's first paragraph makes clear, hip-hop culture – or at least hip-hop music – was extremely materialistic in the period before the financial crisis commenced. This raises the following question: how did a culture founded in an environment of poverty ever come to glorify financial wealth and material possessions on such a large scale?

“Taking it back to the essence, when emceeing really came about,” hip-hop pioneer and historian JDL of the Cold Crush Brothers told me during the summer of 2011, “it was never about money. We never started this culture for money.” Indeed, when looking at the admission price for the first hip-hop block jam ever organized by Clive “DJ Kool Herc” Campbell on August 11, 1973 in the South Bronx – \$0.25 for the ladies and \$0.50 for the “fellas” (XXL, 2015) – it is clear that hip-hop was not founded to become the billion-dollar industry that it is today. At a time when there were no afterschool programs, hip-hop culture emerged as an outlet for young, disenfranchised African-Americans in New York City's inner-city neighborhoods that allowed them to deal with the poverty and social injustices their community faced in a positive way. Nobody got involved with hip-hop culture for the sake of money, because there was hardly any money to be made back then. Says JDL:

If you gave a [hip-hop] party at the time, you'd make about 500 dollars. The deejay got at least 200 to 250 dollars of that because he had to pay for the records and all the equipment, and then the emcees got 50 dollars. Now, in the seventies, if an emcee got 50 dollars, he was at the top of his game, because he could take that 50 dollars, buy himself a pair of Pumas and a pair of Lee's [jeans], and still have change left.

The situation began to change once the music industry got involved. After the abovementioned 1973 block jam, hip-hop had quickly gained popularity beyond the Bronx and even beyond New York City, and hip-hop's early commercial successes such as 1979's "Rapper's delight" by the Sugar Hill Gang proved that mainstream audiences were interested in rap music. Record companies realized that there was in fact big money to be made off of hip-hop, and started courting hip-hop artists. Capitalizing on hip-hop artists' lack of knowledge about financial issues and the workings of the music industry – JDL: "We didn't know nothing about contractual agreements, we knew nothing about entertainment lawyers, we didn't even know how many papers does a standard contract has to be" – the record companies walked away with most of the earnings of early commercial rap. Having learned from the mistakes of their predecessors, the next generation of rappers made sure their contracts were in order and started really making money, a development which would significantly change hip-hop culture: what was originally a movement formed as an outlet for its followers had changed to be about acquiring wealth and displaying it. This displaying of wealth became even more important once rap videos started being played on MTV. Artists such as LL Cool J and Run-D.M.C. wore gold chains and sported the latest Adidas sneakers in these videos, inspiring their fans and other rappers to want the same. As JDL illustrates:

Emcees that used to be satisfied with not getting nothing or getting 30 or 40 dollars a show, they started seeing things that they never could've imagined they'd ever see. When it started being visual with the videos, (...) everybody wanted to have a big gold chain, everybody wanted to have a big Cadillac. And then every generation after that wants the same thing that the generation before them have or more.

As such, hip-hop's seemingly ever-expanding materialism was born.

The second phase of rap's 'materialization' was issued in during the second half of the 1980s when 'gangsta rap' emerged on the West Coast of the United States. Gangsta rap was characterized by explicit, violent lyrics that describe the everyday lives of America's gang members and drug dealers, and many gangsta rappers were actually involved in criminal activities. The Compton drug dealer turned gangsta rapper Eazy-E, for instance, used the money he had earned from selling drugs to found his own record label Ruthless Records as well as the infamous rap crew N.W.A (Diallo, 2009). Although late 1980s' and early 1990s' gangsta rap mostly told tales of antiestablishment hell-raisers, gradually the role of the savvy,

composed ‘hustler’ came to stand central in gangsta rap lyrics. Hustlers were not the businessmen of Wall Street but the much-admired entrepreneurs of the streets, whose most important goal in life was to make as much money as possible, be it legally or illegally. Hip-hop’s admiration of the hustler led to the popularity of ‘mafioso rap’ in the mid-1990s, a subgenre heavily influenced by classic gangster movies such as *The godfather*, *Goodfellas* and *Scarface*. Mafioso rappers such as Jay-Z and The Notorious B.I.G. portrayed themselves not as street criminals but as mobsters with class, and the imagery surrounding their music corresponded to their lyrics about luxurious cars, suits, jewelry, yachts, mansions, cigars, and champagne. Even after mafioso rap declined in popularity again around the turn of the century, its imagery would stay around for years to come, as evidenced by the expensive chains and million-dollar music videos of artists like Rick Ross, Kanye West, and 50 Cent in the 2000s. To illustrate, on his song “Got money” (2008), the extremely popular materialistic rapper Lil Wayne brags about wearing 8 diamond chains at the same time and refers to himself as “Mr. Make-It-Rain-On-Them-Hoes”, referring to the practice of ‘making it rain’: throwing stacks of 100 dollar bills up in the air into a crowd as the ultimate display of not having to worry about your finances. Moreover, the following excerpt from 50 Cent’s “I get money” (2007) shows that rappers would often almost exclusively brag about their financial successes, unapologetically displaying their materialism during this period: “I ride, wreck the new Jag, I just buy the new Jag⁶⁶ / Now, nigga, why you mad? Oh, you can’t do that?” This taunting couplet could be considered evidence of just how out of touch with the struggling hip-hop community rappers started to become during this time, as 50 Cent is essentially making fun of the financial situation of virtually all of his listeners.

8.1.2 Hip-hop after the financial crisis’s onset

In late 2008, soon after the financial crisis commenced and a year after his hit song “Good life” came out, Kanye West released the album *808s & heartbreak*, on which he made a U-turn from his previous work both sonically and thematically. Instead of the upbeat, major key songs of his previous album, his 2008 record was marked by somber productions featuring introspective lyrics in which the rapper painted a significantly different picture than he did the year before. On “Welcome to heartbreak”, for instance, West again discusses his expensive material possessions. This time around, however, he is not boasting about them so much as he is lamenting

⁶⁶ *Jag* stands for the expensive Jaguar car brand.

the fact that none of his wealth can compare to the immaterial, priceless pleasure of raising a child. These lyrics suggest West's views on materialism had changed, recognizing that there may be more to life than merely chasing material wealth. On the same song, he even acknowledges this by explicitly referencing his 2007 song "Good life": "Chased the good life my whole life long / Look back on my life, and my life gone; where did I go wrong?"

Although West's changed outlook on life and materialism might have been caused primarily by events in his personal life at the time – his mother died from post-operative factors after undergoing plastic surgery in November 2007, for example (Reid, 2007) – there is evidence suggesting that what happened on Wall Street in 2008 influenced him as well, as there were plenty of other prominent rap artists whose lyrics and behavior started expressing their dissatisfaction with Wall Street's as well as their own greed and materialism. For example, in 2011, 50 Cent – arguably the poster child for hip-hop's materialism in the early 2000s – set out to serve a billion meals to impoverished children in Africa (Greenberg, 2011). Furthermore, on the 2010 joint album *Distant relatives* by Nas and Damian Marley, many anti-materialistic messages were communicated in the lyrics. For instance, on the song "Count your blessings" (2010), Damian Marley sings: "I've got love and assurance, I've got new health insurance / I've got strength and endurance, so I count my blessings." And on that same song, Nas tells his listeners to quell their desires of owning a Rolls-Royce and rather appreciate the things they work hard for.

It could be argued that the observed decrease in materialism in the music of many established rappers might not be due to the financial crisis at all. Coming from humble backgrounds, it is understandable rappers would initially want to show off their newfound wealth and then later, as they get older, tone down their materialism and become more introspective about their consumption patterns. However, it is not just the established hip-hop artists who seemed to respond to anti-materialism sentiments in society: after the arrival of the financial crisis, a new generation of rappers emerged comprising artists such as Kendrick Lamar, Chance the Rapper, and J. Cole, whose work does not profess their material wealth as much, and who even explicitly dissociate themselves from hip-hop's culture of materialism. Having accumulated large debts as a result of his college education, J. Cole discussed his financial problems more often than he did his successes in most of his earlier songs. To illustrate, on the 2010 song "Blow up", he raps about financial problems such as

his outstanding student loans – “you make a good salary just to pay Sallie Mae”⁶⁷ – and his credit score – “she drop it low, lower than my credit score (...) what I got this debit for?” Furthermore, the two white hip-hop artists Macklemore and Ryan Lewis’s song “Thrift shop” (2012) was arguably the biggest hit rap song of the last few years, as it peaked at number one in countless countries around the world and went on to sell over ten million copies in the United States alone. Because of its subject matter, it is difficult to imagine the song being as successful as it was if it had been released in the pre-crisis era of hip-hop. That is because the song’s humorous lyrics promote saving money by buying second-hand clothes at thrift shops – “I’m gonna pop some tags,⁶⁸ only got 20 dollars in my pocket” – in the process mocking the excessive flaunting of expensive products so common to rap lyrics and the high prices of designer clothing (“I’m like, ‘yo, that’s fifty dollars for a *t-shirt*...’”). Such negative expressions of dissent against the celebration of materialism, brands, and corporations were also expressed by the Atlanta-based rapper Waka Flocka Flame, who came up in the music industry as a rapper with a particularly materialistic image. During a 2015 interview at the morning radio show The Breakfast Club, he discussed how his views on materialism had changed:

I stopped wearing jewelry, (...) I’m not trying to impress nobody. You know I got paper.⁶⁹ Why I got to keep showing you every day? Why I got to keep buying these new cars? Why I got to keep [buying] brands that ain’t doing nothing for the people that I’m around?

The examples above seem to confirm that rappers and their lyrical content became less materialistic at a time that coincides with the financial crisis. However, it is important to note that materialistic rap lyrics by no means disappeared entirely. If they had, we would never have heard materialistic hit songs such as Rick Ross’s 2010 songs “B.M.F. (Blowin’ money fast)” and “Aston Martin music” or Drake’s 2011 song “Dreams money can buy”. Moreover, Kanye West’s song “So appalled” (2010) features a verse from Jay-Z in which he brags he could afford to spend 30

⁶⁷ Sallie Mae is the nickname of the SLM Corporation (originally: Student Loan Marketing Association) – the organization that distributes student loans in the United States.

⁶⁸ The slang expression to *pop (some) tags* means ‘to buy something’ (i.e., take the price tag off a product). The expression is usually reserved for expensive purchases (cf. Jay-Z’s 2002 song “Poppin’ Tags”), so by using it in a context of thrift shopping, Macklemore humorously plays with its usual connotations.

⁶⁹ *Paper* is slang for ‘money’.

million dollars even when he just lost that same amount of money. Even Kanye West, who seemed to have completely quit materialism back in 2008, showed that he most certainly still cared about money on the 2011 song “Who gon stop me” when he addresses accusations that he is racist against white people: “Heard Yeezy⁷⁰ was racist / Well, I guess that’s on one basis: I only like green faces.” In this context, “green faces” refers to the green-colored portraits printed on dollar bills.

Such examples show that it should definitely not be concluded that *all* rappers expressed their dissatisfaction with materialism or that hip-hop abandoned materialism entirely, for there is a clear lack of uniformity among rappers, with certain rappers seemingly expressing dissent against materialism while simultaneously glorifying it. In this respect, it is important to note that before the crisis, rappers were also not a completely homogeneous group with regards to the topic of materialism. In 2004, for instance, the aforementioned Kanye West released a song titled “All falls down” in which he critically examined his desire to acquire expensive material possessions. Nevertheless, a qualitative analysis of rap lyrics from both periods does seem to indicate that rap music as a whole became less materialistic after the onset of the financial crisis.

8.2 Quantitative analysis of rap’s materialism

The previous section showed that although there is evidence that pre-crisis rap was more materialistic than rap music from after the onset of the financial crisis, there are plenty of instances of rap songs from the latter period that were at least as materialistic as those from before the crisis. The present section of this chapter attempts to objectively analyze whether rap lyrics indeed became less materialistic after the crisis’s onset by quantitatively analyzing rap lyrics from before and after the crisis’s onset regarding how much materialistic content they contain. To this end, a corpus analysis study was conducted, in which notable rappers’ lyrics from a three-year period before and a three-year period after the crisis’s onset were compared to each other to see if there was a change in the amount of materialistic references they contained.

It has to be noted here that on their own, the results of this quantitative study will not be entirely transparent, for information on increases or decreases regarding the relative frequency of materialistic terms does not reveal whether the materialistic terms were used in a more positive or a more negative context. In theory, it could be that rappers rapped more about materialistic topics not because they were more

⁷⁰ Yeezy is one of Kanye West’s aliases.

enthusiastic about materialism, but because they felt the need to condemn or criticize it more than they did before. The computational frequency analysis discussed in this chapter simply does not distinguish between (hypothetical) phrases in rap lyrics such as “I don’t care about money” and “money over everything”; both tokens of “money” would add to the amount of observed references to materialism. Nevertheless, arguably the most straightforward interpretation of a decreased use of materialistic terms in rap lyrics would be that rappers were less concerned with materialistic content. Taking this approach to the data will inevitably mean that a few of the corpus’s tokens will be misinterpreted, but this is a rather surmountable problem considering the large size of the corpus (namely over 600000 words with nearly 4000 tokens of materialistic terms; for a full description, see the Design section below).

As will be elaborated upon in the Design section below, the corpus was designed to be representative of the diverse rap music landscape. Therefore, if the quantitative data analysis were to reveal that rappers indeed used significantly less materialistic terms overall, the conclusion could be drawn that hip-hop as a whole changed concerning materialism, even if certain individual rappers were found to have gone against the average trend of the group.

8.2.1 Design

To analyze rap lyrics from before and after the crisis quantitatively, a corpus of rap lyrics from before and after the onset of the financial crisis (fall of 2008) was created. The corpus comprises the lyrics of 1191 rap songs from the periods 2006 until 2008 (573 songs) and 2009 until 2011 (618 songs), which makes for a total number of 623021 words (300889 words for 2006-2008 and 322132 words for 2009-2011). The songs incorporated in the corpus are taken from thirteen different rap artists: 50 Cent, Drake, J. Cole, Jay-Z, Kanye West, Lil Wayne, Lupe Fiasco, Nas, Rick Ross, Snoop Dogg, The Game, T.I., and Young Jeezy.⁷¹ Artists were selected for analysis if they could be considered sufficiently relevant and influential to the genre of hip-hop between 2006 and 2011, something which was loosely determined along the following parameters: (1) commercial success and popularity (e.g., album and/or single sales or streams, social media followings, etc.) and (2) critical acclaim. In addition, it was made sure that the selected artists were not all

⁷¹ The lyrics from Jay-Z and Kanye West’s joint 2011 collaborative project *Watch the Throne* and Rick Ross’s 2011 collaborative project with other artists signed to his record label Maybach Music Group were also included in the corpus.

from the same geographical area in order to prevent the corpus from being clearly biased towards any particular regional scene.

All songs that these thirteen artists released within the period of 2006-2011 were selected in order to create a corpus as representative as possible of each individual's work during the respective period. Due to the fact that not all artists released the same amount of material in this period, some artists are more strongly represented in the corpus than others. This was not deemed a significant problem, for the individual differences with regards to the amount of words could easily be cancelled out by using relative frequencies rather than absolute ones to compare the materialism in the work of individual rappers. In addition, it was decided that in light of the aim to create a corpus as representative of hip-hop as a whole between 2006 and 2011 as possible, differences between artists concerning the amount of material released should be represented in the corpus as they reflect the landscape of hip-hop music at the time, namely accounting for the fact that some artists appeared more often than others on the radio, television, etc.

For the present study, the hip-hop corpus described above was computationally analyzed using UNIX tools. Whether a change in the amount of materialistic references had occurred following the crisis's onset was analyzed by measuring how often certain words related to money and materialism were used before and after the beginning of the crisis. The items selected for the current analysis were *money*, *cash*, *dollar*, *diamond*, *gold*, *rich*, *bling* (slang word describing particularly shiny jewelry), *dough* (slang word meaning 'money'), *million* (including derivatives such as *millionaire*), *chain*, and *bank*.⁷² Two different frequency measurements were performed: (1) per individual rapper for the period before the crisis (henceforth: pre-crisis period) and after the onset of the crisis (henceforth: post-crisis period), and (2) for all rappers combined for both periods as well as per year.

8.2.2 Results

To test the hypothesis, it was determined for each rapper how often the abovementioned materialistic terms were used relative to the size of their individual corpora for both the pre-crisis and post-crisis periods. Table 8.1 and Figure 8.1 show the results of these measurements, with the former also showing the post-crisis/pre-crisis ratio per artist (numbers below 1 indicate a decrease and numbers above one indicate an increase in the usage of materialistic terms). The ratios reveal that

⁷² Specific slang alternatives for certain words (e.g., *mill(i)* for *million*) and alternate spellings (e.g., *dolla(h)* instead of *dollar*) were taken into account in the frequency analyses performed.

Table 8.1. Relative frequencies of materialistic terms for all analyzed rappers’ lyrics (sorted alphabetically).

	Rel. freq. 2006-08 (%)	Rel. freq. 2009-11 (%)	Post-/pre-crisis ratio
50 Cent	1.48	0.79	0.534
Drake	0.51	0.52	1.020
J. Cole	0.60	0.39	0.650
Jay-Z	0.40	0.44	1.100
Kanye West	0.32	0.52	1.625
Lil Wayne	1.20	0.74	0.617
Lupe Fiasco	0.29	0.25	0.862
Nas	0.62	0.26	0.419
Rick Ross	1.58	0.98	0.620
Snoop Dogg	0.34	0.41	1.206
The Game	0.56	0.47	0.839
T.I.	0.42	0.84	2.000
Young Jeezy	0.76	0.81	1.066

Figure 8.1. Relative frequencies of materialistic terms for all analyzed rappers’ lyrics (sorted from highest to lowest relative frequency in the pre-crisis period).

although the majority of the artists used materialistic terms less often in their lyrics after the beginning of the crisis than before, some of them actually used such terms more often in the post-crisis period. On average, the rappers selected for analysis used words related to money and materialism more often before the onset of the

Table 8.2. Relative frequencies of materialistic terms per year.

	Rel. freq. (%)
2006	0.77
2007	0.75
2008	0.73
2009	0.42
2010	0.59
2011	0.55

Table 8.3. Relative frequencies of materialistic terms per period.

	Rel. freq. (%)
Pre-crisis (2006-2008)	0.75
Post-crisis (2009-2011)	0.52

crisis ($M = .0070$, $SE = .0012$) than they did after it arrived ($M = .0057$, $SE = .0007$). However, a paired samples t -test revealed this difference was not significant ($t(12) = 1.430$; $p = .178$).

A frequency analysis of all the rappers' lyrics combined per year (meaning that some artists are more strongly represented in the corpus than others on the basis of the fact that they released more music that specific year) revealed the relative frequencies of words related to money and material wealth presented in Table 8.2. The relative frequencies of these words for the pre-crisis and post-crisis periods are displayed in Table 8.3. On average, words related to money and materialism were used more often before the arrival of the financial crisis ($M = .0075$, $SE = .0001$) than they were after its arrival ($M = .0052$, $SE = .0005$). An independent samples t -test revealed this difference was significant ($t(4) = 4.373$; $p < .05$).

8.2.3 Discussion

On average, lower frequencies for words related to money and materialistic wealth could be observed in lyrics from the post-crisis period compared to lyrics from the pre-crisis period, especially in the case of 50 Cent, Lil Wayne, and Rick Ross – rappers who were greatly materialistic before the crisis but showed remarkable decreases in their usage of materialistic terms after the crisis commenced. However, the frequency difference between pre-crisis and post-crisis lyrics was not found to be significant across all rappers when assigning equal weight to the work of each rapper. When looking at a more accurate portrayal of the hip-hop landscape between 2006 and 2011 (i.e., not assigning equal importance to each individual artist but instead taking into account that some artists were more strongly present because

they released more music), however, a significant difference between the pre-crisis and post-crisis periods regarding the relative frequency of materialistic terms was found. This provides support for the qualitative analyses' findings that post-crisis rap lyrics were less materialistic than pre-crisis ones. In Table 8.2, it can be clearly observed how around the time the crisis first arrived, a rather large drop in the use of materialistic terms occurred, followed by a slight increase again, one which does not, however, come close to any of the pre-crisis values.

This quantitative analysis of rap lyrics' materialism is not without its limitations, most notably the fact that it does not discriminate between references to materialism in positive or in negative semantic contexts. To counter this limitation, one could consider a computational collocation analysis, i.e., an analysis of whether the corpus's materialistic terms co-occur with negative or positive words. However, in order for such an analysis to be feasible, the corpus would need to be expanded to include millions of words, and considering that computers are notoriously bad at recognizing stylistic devices such as irony or semantic inversion, analyzing the poetry of rap lyrics might result in unreliable data even if the corpus were of a sufficient size. Another option would be to manually analyze each of the materialistic tokens in the corpus as was done in the in-depth qualitative analyses of rap lyrics that are presented throughout this chapter. Considering that there are nearly 4000 of these materialistic tokens in the corpus, however, this would be an unfeasible undertaking. It was therefore decided to accept the limitations of the quantitative analysis in its current form for the present study, instead comparing the frequency analysis data to the in-depth qualitative analysis of select rap lyrics presented in the rest of this chapter on the basis of the likely, straightforward assumption that the degree to which a rapper cares about material possessions correlates to the degree to which he discusses these topics in his lyrics.

The aim of the quantitative analysis was to provide a more objective perspective to what was essentially a subjective analysis of rap lyrics' materialism as it developed over time, and to counter possible biases in the selection of pre-crisis and post-crisis rap lyrics for the qualitative analyses by zooming out and seeing if statistically verifiable conclusions could be drawn on rap lyrics' changing degrees of materialism. The quantitative data show that, overall, the rappers in the study's corpus discussed materialistic topics significantly less often on a group level. Naturally, a few individual rappers such as T.I. were found to behave differently than the group did on average, but this was to be expected considering that rappers and the hip-hop community cannot be considered a completely homogeneous group. The findings of this study should therefore definitely not be interpreted as indicating

that each and every rapper became less materialistic following the crisis's onset, for such a claim clearly would be false. Rather, the findings should be interpreted as showing that even though some rappers might not have been concerned with expressing dissent against materialism, hip-hop *as a whole* did change to become less materialistic following the financial crisis.

8.3 Occupy Wall Street and the hip-hop community

The qualitative and quantitative analyses of rap lyrics discussed above indicate that although the situation is not entirely clear-cut, rappers' lyrics from after 2008 seem to be less about money and materialism than they were during the pre-crisis period. The question remains, however, whether rappers not only responded to the crisis by expressing their dissatisfaction with materialism but also by aligning themselves with protest movements and inspiring their listeners to do the same.

As stated in the present chapter's introduction, the African-American community was disproportionately hit by the financial crisis (Mui, 2012). First of all, they were among the most severely affected by the subprime mortgage crisis many analysts believe triggered the recession (Davies, 2010). Due to the 1977 Community Reinvestment Act compelling banks to give out loans to low-income borrowers (in practice mostly African-Americans and Hispanics) and the Clinton and Bush administrations stimulating homeownership among ethnic minorities (in 1985, homeownership among African-Americans was 44.4 percent compared to 64.3 percent in the United States as a whole; Davies, 2010), banks were not prohibited from providing "bad loans to un-creditworthy borrowers" (Di Lorenzo, as cited in Davies, 2010, p. 30) but rather *encouraged* to do so. Such bad loans – subprime mortgages – had higher interest rates than the mortgages given out to more creditworthy borrowers, and hence became unaffordable once the period of economic prosperity came to a sudden end, causing many African-Americans to default on their payments and lose their homes. Furthermore, unemployment rates among African-Americans were roughly twice as high as white unemployment rates during the crisis, and between 2005 and 2009, African-American households lost more than half of their median net worth whereas white families lost only 16 percent (Patton, 2011; Kochhar, Fry, & Taylor, 2011).

Clearly, the hip-hop community had a reason to be upset with Wall Street's greed and government policies that had put them in this desperate position. To assess how the hip-hop community felt about Wall Street's role in the crisis and hip-hop's response to the crisis, I interviewed circa 30 self-proclaimed members of New York City's hip-hop community in the summer of 2011. These were all impromptu street

interviews, the majority of which were conducted specifically on 125 Street in Harlem – the Manhattan neighborhood that is home to the world’s largest African-American community – and inside that street’s famous Apollo Theater. Interviewees included Billy “Mr. Apollo” Mitchell (the Apollo Theater’s official historian and tour guide), and a number of other people who either worked at the theater or happened to be there at the time the interviews were conducted. The rest of the interviews were conducted in Midtown Manhattan’s Rock and Soul record store, which is known for its extensive hip-hop vinyl collection. Interviewees were asked how they felt about the crisis’s effects on their community, what they thought of Wall Street and its role in the crisis, how they felt about hip-hop’s materialism, whether they thought hip-hop’s materialism had changed following the crisis’s onset, and whether or not they believed that rappers were still in touch with the hip-hop community. These questions were asked to gain a better understanding of the sentiments present in the hip-hop community, so that this information could be related to the present study’s rap lyrics analyses.

While conducting these interviews, I encountered the same kind of views as the Occupy Wall Street activists would come to express later that year. “We’ve outgrown the whole pursuit of money and materialism; there’s more important things in life,” a woman working at the Apollo Theater told me regarding her views on hip-hop’s materialism. Her colleague added that as far as the crisis is concerned, the people from Harlem and the rest of New York’s African-American population felt like they were forgotten by the rest of the country: “All the attention goes to Wall Street. When the economy is doing well, they profit; when it goes downhill, we are the ones who have to pay.” The opinions articulated by the abovementioned interviewees were overwhelmingly shared by the other people I interviewed, with a few of these people adding that they believed the arrival of the financial crisis and the election of Obama had considerably impacted rappers’ lyrical content.

From this information, it seems only logical to assume that the African-American hip-hop community would actively support the message communicated by the Occupy Wall Street movement. However, the statistics tell a different story. Despite the fact that in 2011, African-Americans made up 12.6 percent of the country’s population, they made up only 1.6 percent of the Occupy Wall Street movement’s activists (Captain, 2011). Possible explanations for this that have been put forward are, for example, that African-Americans may feel there are more important issues for them to protest (cf. the later Black Lives Matter movement) or that they fail to see why they should join a protest against Wall Street that only

emerged once whites started to encounter the problems that African-Americans had been dealing with for decades already.

Whatever the reason for the African-American community's (and consequently, the hip-hop community's) lack of involvement with the Occupy Wall Street movement may be, it was certainly not for a lack of effort by its most prominent spokespersons: rappers. Despite all belonging to the one percent in terms of their net worth, multimillionaire hip-hop artists and moguls such as Russell Simmons (co-founder of Def Jam Recordings) and Kanye West identified with the protesters' plight and attended the Zuccotti Park occupation (Perpetua, 2011) with artists like the Brooklyn rapper Talib Kweli even giving spontaneous performances on site to show their support (Sundermann, 2011). The socio-politically engaged Chicago rapper Lupe Fiasco showed his support by donating tents for the protesters and by writing lyrics about their struggle. For instance, on his 2011 single "Words I never said", Lupe Fiasco rhymes that "crooked banks around the world would gladly give a loan today / So if you ever miss a payment, they can take your home away," and on "The end of the world" (2011), he dedicates an entire verse to the Occupy Wall Street movement. Moreover, through a Facebook post on October 21, 2011, Nas shouted out the 99 percent in reference to Occupy Wall Street's "we are the 99 percent" slogan, quoting from his song "Dispear" (2010): "Who are the Masters? They are the gangsters / They are the bankers, (...) the Wall Street war chiefs." In the song's lyrics, Nas describes a dichotomy in society, with on the one hand the politicians and bankers who wield all the power, and on the other hand the people who are the victims of this power monopoly. By referring to the elite as "Masters", Nas compares the way the "Wall Street war chiefs" treat the country's citizens to the way slave masters used to treat African slaves.

8.4 Hip-hop materialism 2.0

So where exactly does hip-hop culture stand on issues such as materialism, Wall Street, and corporate avarice now that the Occupy Wall Street movement has long died down, unemployment rates are decreasing again, and the economy as a whole is getting back on its feet? Has the decrease in materialistic content that was found in the qualitative and quantitative analyses of rap lyrics from before and after the crisis's onset sustained, and have rappers remained as critical of corporations' greed as they were at the height of the Occupy Wall Street movement's existence? The answer is probably "no". Recently, there seem to be far fewer prominent rap songs that contain explicitly anti-materialistic messages to the same extent that songs like the earlier mentioned "Count your blessings" (2010) by Nas and Damian Marley

did, and with politically engaged artists such as Talib Kweli having moved on to support the Black Lives Matter movement, anti-Wall Street lyrics appear to be in decline as well.

However, this does not mean that the crisis has not had a lasting impact on hip-hop music (cf. Table 8.2, which displays a strong dip in the frequency of materialistic terms in 2009 followed by a slight increase in 2010 and 2011 again). Anti-materialistic messages are still present in many rap songs in a way that they were not before the crisis, but these messages are delivered more subtly than in the years immediately following the collapse of the stock market. To give an example, on Drake's 2011 hit single "Headlines", he raps the following bars: "I be yellin' out: 'Money over everything, money on my mind' / Then she wanna ask when it got so empty." Hidden behind a typically materialistic hip-hop trope – "money over everything, money on my mind" – Drake expresses feelings of guilt about being so focused on pursuing material wealth. J. Cole takes a similar approach; on his appropriately titled song "2Face" (2010), he expresses how despite being critical of materialism, he cannot help but want all these expensive things for himself: "The fast life I done seen on the screen is addictive, money and clothes I done dreamed about / (...) Aye, tell me am I wrong for visualizing material shit I never had?"

On his 2013 song "Chaining day", J. Cole came back to this theme of desiring expensive things while condemning such feelings at the same time: "My last piece,⁷³ I swear, my guilt heavy as this piece I wear / (...) So don't take these chains from me, 'cause I chose this slavery." Playing with the polysemy of the word *chain*, which can refer both to necklaces and the chains that his enslaved ancestors were forced to wear, J. Cole dedicates an entire song to his own avarice, describing his desire to buy new jewelry as a form of slavery, and pointing out the irony of indulging in one of the deadly sins – greed – by buying jewelry in the image of Christ. That same year, Kanye West also described people's addiction (his own included) to brands and luxury items in terms of slavery on "New slaves" (2013): "You see, it's broke nigga racism, that's that: 'don't touch anything in the store' / And it's rich nigga racism, that's that: 'come in, please buy more' (...) – new slaves." Perhaps the best example of rappers subtly interweaving anti-materialistic messages in otherwise highly materialistic songs is Jay-Z's 2013 song "Oceans", which features vocals from Frank Ocean. At first listen, the song merely appears to be about an extravagant yacht party somewhere on the Atlantic Ocean. On closer

⁷³ In hip-hop slang, *piece* can have many meanings (e.g., 'gun'), but in the present context, it refers to a necklace in Jesus Christ's image, a so-called *Jesus piece*.

inspection, however, it turns out that the song's message is not as straightforwardly materialistic as one might expect. In a promotional video for the *Magna Carta... holy grail* album "Oceans" appears on, Jay-Z remarks that the theme of the song is "duality", explaining that the lyrics sound "like a celebration of where we are now, on some big yacht and throwing champagne in the water, but the undertow of the thing is [that] this same water is the water that brought us here originally, as slaves" (2013).

Duality, as Jay-Z called it, is what characterizes hip-hop's materialism today. Neither upcoming rappers nor already established rappers are likely to ever completely do away with the topic of money and material possessions, which is understandable considering the environments they usually come from. Moreover, judging from the hip-hop community's widespread admiration of financial successes by hip-hop moguls such as Dr. Dre, whose Beats headphone company was recently bought by Apple for 3 billion dollars (Solomon, 2014), the hip-hop community has not completely turned its back on materialism and the pursuit of money either. But seeing the impact that the financial crisis had on society at large and the African-American (hip-hop) community in particular definitely seems to have left a mark on the way rappers touch on materialistic subject matter nowadays.

8.5 Conclusion

To conclude, the results of qualitative and quantitative analyses of the development of rap lyrics' materialism as well as interviews with members of New York City's hip-hop community show that hip-hop culture as a whole indeed appears to have changed to become less concerned with materialism and more critical of (corporate) avarice. This development coincided with the arrival of the financial crisis, and considering that rappers have always communicated what they experience in their personal lives and what they see going on in the hip-hop community, it is not unlikely that this development was the direct result of rappers expressing dissent against materialism due to the financial crisis. Moreover, despite the fact that African-Americans were not as involved with the Occupy Wall Street movement as one might expect considering their strong anti-Wall Street sentiments, it was found that many rappers actively participated in the Occupy Wall Street movement by protesting and attempting to mobilize their fans to follow suit. This confirms the idea that through their music, rappers can offer insights into their own and their community's critical conscience.

None of the abovementioned conclusions should be taken to indicate that rappers completely lost their materialism after the crisis began, however, nor should

they be interpreted as indicating that *all* rappers responded to the financial crisis in a uniform manner. Materialism is still deeply rooted in hip-hop culture, and it is unlikely that it will ever completely disappear. The financial crisis's lasting impact on hip-hop is therefore not so much that it did away with rappers' materialistic desires, but rather that it caused many of them to evaluate those desires more critically than they ever did before the crisis. It also caused them to actively express their dissatisfaction with and dissent against society's materialistic behavior as well as their own, and it could be argued that by doing so, the rappers who expressed their dissent against materialism and greed brought hip-hop's one percent and hip-hop's 99 percent closer together.

8.6 Acknowledgments

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APPENDIX: 2PAC TIMELINE

"Another album out, that's what I'm about: more. Gettin' raw 'till the day I see my casket. Buried as a G while the whole world remembers me until the end of time..."

– Tupac Shakur ("Until the end of time")

Appendix Table 10.1. Timeline of notable events in 2Pac's life and career.

Date(s)	Event
1971-06-16	Birth (New York City, NY)
1984-08	Move to Baltimore, MD
1988-06	Move to Marin City, CA
1991-08-15	Signs record contract with TNT & Interscope Records
1991-11-12	Release of debut album <i>2Pacalypse now</i>
1992	Move to Oakland, CA
1992-01-17	Theatrical release of movie <i>Juice</i> , 2Pac's first movie role
1992-05	Move to Los Angeles, CA
1993-02-12	Release of sophomore album <i>Strictly 4 my N.I.G.G.A.Z...</i>
1993-07-23	Theatrical release of movie <i>Poetic justice</i>
1994-05-10 – 1994-05-24	[Incarcerated] Los Angeles County Jail (sentence for assaulting Allen Hughes)
1994-09-26	Release of <i>Thug life: Volume 1</i> by 2Pac's group Thug Life
1994-12-01	Shot at Quad Recording Studios (New York City, NY) at 12:26 a.m.
1994-12-01	Convicted of sexual assault (New York City, NY)
1994-12-02 – 1995-03-07	[Incarcerated] Rikers Island, NY (sentence for sexual assault)
1995-03-08 – 1995-10-12	[Incarcerated] Clinton Correctional Facility, NY (sentence for sexual assault)
1995-03-14	Release of third solo album <i>Me against the world</i>
1995-09-16	Signs record contract with Death Row Records on the condition they post bail
1995-10-13	Return to Los Angeles, CA
1996-02-13	Release of double album <i>All eyez on me</i>
1996-09-07	Shot in a drive-by shooting near The Strip (Las Vegas, NV) at 11:15 p.m.
1996-09-08	[Hospitalized] University Medical Center of Southern Nevada (Las Vegas, NV)
1996-09-13	Death (Las Vegas, NV) at 4:03 p.m. at age of 25
1996-10-01	Theatrical release of movie <i>Bullet</i>
1996-11-05	Release of album <i>The don Killuminati: The 7 day theory</i> (under the alias of Makaveli)
1997-08-21	Theatrical release of movie <i>Gridlock'd</i>
1997-10-08	Theatrical release of movie <i>Gang related</i>

Appendix Table 10.2. Known recording dates for 2Pac's discography. In case a song was recorded over a longer period of time (or if it was unclear when it was recorded exactly), the period of recording is listed in the second column. Songs listed below the dotted line were recorded while 2Pac was signed to Death Row Records.

Recording date	Recording period	Song title
1985	<i>1985 – 1986</i>	Rock on
1985		MC Cop
1985-02		Nigga please
1986		You can't stop me
1986		You're talkin, that bullshit
1987		Babies having babies
1987		Breakin thru
1987		Check it out
1987		Genocide (Us killing us)
1987		U don't wanna battle me
1987		When will you learn
1987		You're a hot bitch (Reference for Jada Pinkett & Linda)
1988		Freestyle
1988		Get some for girls
1988		Let's get it on
1988		Lifestyles of the poor and homeless
1988		We work hard
1988-02		Terror on the tables
1988-02		That's my man throwing down
1988-03		I saw your girl
1988-04		Girls be tryin to work a nigga
1989		A day in the life
1989		Minnie the Moocher
1989		Never be beat
1989		The case of the misplaced mic
1989		The case of the misplaced mic, pt. 2
1989		Fantasy
1989		One nation emcees
1989		Panther power
1989-06-25		Let knowledge drop
1989-07		My burnin' heart
1990		Same song
1990		You don't wanna battle (I thought U knew)
1990		Dayz of a criminal
1991		Scared straight
1991-01		Do for love
1991-01		What U won't do for love
1991-02		Dopefiends diner
1991-02		Resist the temptation

1991-02		Revenge of the lunatic
1991-02		Tearz of a clown
1991-03		Young black male
1991-03		Static mix, pt. 1
1991-03		Static mix, pt. 2
1991-03		Fadeaway
1991-03		The DFLO shuttle
1991-04		It ain't necessarily so
1991-05		Brenda's got a baby
1991-05		Words of wisdom
1991-05		Scared straight 91
1991-05	<i>1991-05 – 1991-06</i>	Trapped
1991-06		Crooked ass nigga
1991-06		Rebel of the underground
1991-06		Tha' lunatic
1991-07		#1 with a bullet
1991-07		Violent
1991-07		Break 'em off
1991-07		Family of the Underground
1991-07		Funky freestyles
1991-07		Good thing we're rappin'
1991-08		I don't give a fuck
1991-08		If my homie calls
1991-08		Something wicked
1991-08		No parts of this
1991-09		Part time mutha
1991-09		Soulja's story
1991-09		Papa'z song
1991-09		Straight outta Richtown
1991-10		Crooked nigga too
1991-10		Crooked cop killer
1991-11	<i>1991-11 – 1991-12</i>	Troublesome
1991-11		Leave us kids alone
1991-11		Lovely daze
1991-11		The streetz got your babiez
1991-12		Street life
1991-12-25		Changes
1992	<i>1992 – 1994</i>	Redemption
1992-01		Don't you trust me?
1992-02		Call it what u want
1992-02		Salsa con soulfood
1992-03		Gaffled like that
1992-03		Keep ya head up
1992-03		Po nigga bluez (Cause I had to)
1992-03		Black starry night

1992-03		Let them thangs go
1992-03		Nothin' but love
1992-04		I 6 on death row
1992-04		Still don't give a phuck
1992-04-29		Strictly 4 my N.I.G.G.A.Z...
1992-05		I wonda if heaven got a ghetto
1992-05		When I get free
1992-05		Don't call me bitch
1992-06		Guess who's back
1992-07		Soldier like me
1992-07		Big time
1992-07		Flex
1992-08		I get around
1992-08		What goes on
1992-08	1992-08 – 1992-12	Black cotton
1992-08-06		Representin' 93
1992-08-21		Ghetto gospel
1992-08-21		Ghetto gospel (Alternate version)
1992-09		Pac's theme
1992-09		Point the finga
1992-09		Something 2 die 4
1992-09		Strugglin'
1992-09		The streetz R deathrow
1992-09		N.I.G.G.A.
1992-09		Niggaz in the pen
1992-09		Pac's theme
1992-09		The hellraiser
1992-09-27	1992-09-27 – 1992-12	Brothas in the pen
1992-10		Last wordz
1992-10		Peep game
1992-10		Souljah's revenge
1992-10		Wussup wit tha luv
1992-11		5 deadly venomz
1992-12		Holler if ya hear me (Original version)
1992-12		Holler if ya hear me
1993-01		Comin' real again
1993-01		Gotta get mine
1993-02		Gotta get mine (Radio version)
1993-02-05		Yo! MTV Raps session
1993-03		How long will they mourn me?
1993-03		Definition of a thug nigga
1993-03		Animosity
1993-03		Lie 2 kick it
1993-04		Pour out a little liquor
1993-04		Death around the corner

1993-04		I'm gettin' money
1993-04		Ready 4 whatever
1993-04		Ready 4 whatever (Remix)
1993-04		Thug 4 life
1993-04	<i>1993-04 – 1994-01</i>	Fake ass bitches
1993-04	<i>1993-04 – 1994-01</i>	Thug life
1993-05		I can't turn back
1993-06		Gangsta team
1993-07		I'm losin' it
1993-07	<i>1993-07 – 1994-02</i>	High till I die
1993-08		Faced shootouts
1993-08		Hopeless
1993-08		Time to get my drank on
1993-08	<i>1993-08 – 1994-08</i>	Thugs get lonely too
1993-09		Hellrazor
1993-09		Nothing to lose
1993-09		Is it cool 2 fuck
1993-10		Only fear of death
1993-10		Open fire
1993-10		Out on bail
1993-10	<i>1993-10 – 1993-11</i>	Str8 ballin'
1993-10	<i>1993-10 – 1994-06-30</i>	Temptations
1993-11		Runnin' (Dying to live)
1993-11		Loyal to the game
1993-11		Who do you love?
1993-11		Don't fuck with a killa
1993-11		House of pain
1993-11		Pain
1993-11-05		Let's get it on
1993-12		Cradle to the grave
1993-12		Real bad boyz (Westside)
1993-12		Judgment day
1993-12		Life so hard on a G
1993-12		Loyal to the game (Radio version)
1993-12		Pain (Clean version)
1994		Intro
1994		Life's so hard
1994	<i>1994 - 1996</i>	Album outro
1994	<i>1994 - 1996</i>	Intro (Better dayz)
1994-01		The uppercut
1994-01		Peep game 2
1994-01-31		Where do we go from here
1994-02		Hennessey
1994-02		Danger times
1994-02		It hurts the most

1994-03		God bless the dead
1994-03		I'd rather be your lover
1994-04		Bury me a G
1994-04		Shit don't stop
1994-04		Stay true
1994-04		Under pressure
1994-04		Stay true
1994-05		Skank wit' u
1994-05		Lord knows
1994-05		Fuck all y'all
1994-05	<i>1994-05 – 1994-07-14</i>	Dear mama
1994-06		Jealous got me strapped
1994-06		We do this
1994-06		4 tha hustlas
1994-06		America eatz itz young
1994-07	<i>1994-07 – 1994-11</i>	It ain't easy
1994-07-27		Hellrazor (Radio version)
1994-08		Fuck the world
1994-08		P.Y.T. (Playa young thugs)
1994-08		So many tears
1994-08		Hold on, be strong
1994-08		Wonder why they call you bitch (Original version)
1994-08	<i>1994-08 – 1994-11</i>	R U still down? (Remember me)
1994-08-25		Life so hard (Hard on a nigga)
1994-09		Dusted 'n' disgusted
1994-09		My block
1994-09		My block (Remix)
1994-09-03		If I die 2nite
1994-09-20		Can u get away
1994-09-20		Heavy in the game
1994-09-28		Old school
1994-09-29		Me against the world
1994-10		Outlaw
1994-10		Throw your hands up
1994-10		Young niggaz
1994-10		Enemies with me
1994-10		Sucka 4 love
1994-10-29	<i>1994-10-29 – 1994-11</i>	Late night
1994-11		Thug style
1994-11		When I get free II
1994-11		Killing fields
1994-11		Where will I be?
1994-11-30		Deadly combination
1994-11-30		The heat (Representin 4 Ron G)
1995	<i>1995 – 1996</i>	Big Syke interlude

1995	1995 – 1996	Did it all B4
1995	1995 – 1996	Fuckin wit the wrong nigga
1995	1995 – 1996	International
1995	1995 – 1996	Keep goin'
1995	1995 – 1996	Letter to the president
1995	1995 – 1996	Out in a blaze
1995	1995 – 1996	Sleep
1995	1995 – 1996	Y'all don't know us
1995-10		U can call me up
1995-10		Wonda why they call u bitch
1995-10-13		Ambitionz az a ridah
1995-10-13		I ain't mad at cha
1995-10-14		All bout u
1995-10-14		All eyez on me
1995-10-14		Shorty wanna be a thug
1995-10-14		When I get free
1995-10-15		2 of Amerikaz most wanted
1995-10-15		Picture me rollin'
1995-10-15		Skandalouz
1995-10-15		Come with me (Interlude)
1995-10-17		How do U want it
1995-10-19		Secretz of war
1995-10-19		Still I rise
1995-10-23		Life goes on
1995-10-23		Better dayz
1995-10-24		There U go
1995-10-24		The struggle continues
1995-10-27		When we ride
1995-10-27		U can call (Jazze Pha remix)
1995-10-27		Komradz (So so crazy)
1995-10-28		Only god can judge me
1995-10-28		Ratha be ya N.I.G.G.A.
1995-10-28		M.O.B.
1995-10-28		Bad boy killaz
1995-10-31		Run tha streetz
1995-10-31		Hit 'em up (First version)
1995-11		Got my mind made up
1995-11		Heartz of men
1995-11		Thug passion
1995-11		Letter 2 my unborn
1995-11	1995-11 – 1995-12-02	Holla at me
1995-11-04		California love
1995-11-04		Can't C me
1995-11-04		Blunt tyme
1995-11-06		Check out time

1995-11-06	Where u been
1995-11-13	Fair xchange
1995-11-13	Fair xchange (Remix)
1995-11-16	Whatz ya phone #
1995-11-16	What'z next
1995-11-16	U can't fade me
1995-11-28	Ain't hard 2 find
1995-11-28	Tradin' war stories
1995-11-28	6 or 12
1995-11-28	Married to the MOB
1995-12	No more pain
1995-12	Teardropz and closed caskets
1995-12	Fuck 'em all
1995-12	Initiated
1995-12-13	Heaven ain't hard 2 find
1995-12-13	Soon as I get home
1995-12-14	Ambitionz az a fighta
1995-12-14	NY '87
1995-12-18	Still ballin'
1996-01	Too late playa
1996-01	Unconditional love
1996-01	Everything they owe
1996-01	Never B peace
1996-01	Don't stop
1996-01	Playa cardz right (Female)
1996-01	Playa cardz right (Male)
1996-01	Welcome to Death Row
1996-01-09	Homeboyz
1996-01-09	Outlaw immortal
1996-01-10	Playa cardz right
1996-01-12	Starin' through my rear view
1996-01-12	If they love their kidz
1996-01-13	He vs she (4 my niggaz)
1996-01-22	Who do you believe in
1996-02	Ballad of a dead soulja
1996-02	Never had a friend like me
1996-02-01	1996-02-01 – 1996-07-11
1996-02-02	When thugz cry
1996-02-13	Thugz mansion
1996-02-19	My closest roaddogz
1996-02-21	Until the end of time
1996-02-21	Changed man
1996-02-26	If there's a cure for this
1996-02-26	Mama's just a little girl
1996-02-26	Never call U bitch again
1996-02-26	Just watching

1996-02-29		Me and my homies
1996-03		Thug luv
1996-03		Breathin'
1996-03		Lil' homies
1996-03		When we ride on our enemies
1996-03		Don't sleep
1996-03-08		Words to my first born
1996-03-08		Ghetto star
1996-03-08		Things are changing
1996-03-14		This ain't livin
1996-03-14		Road 2 glory (Mike Tyson vs Frank Bruno)
1996-03-16		Wherever U R
1996-03-29		Hit 'em up
1996-03-30		Good life
1996-04		Happy home
1996-04		Thug N U thug N me
1996-04		The realest killaz
1996-04		Um dumpin'
1996-04	<i>1996-04 – 1996-06-15</i>	Let's fight (Jawz tight)
1996-04-04		Borrowed times
1996-04-08		Troublesome 96
1996-04-13		Tongue kissin' (Tha wrong nigga)
1996-04-15		They don't give a fuck about us
1996-04-23		Made niggaz
1996-04-24		U can be touched
1996-04-24		Last ones left
1996-04-24		World wide mob figgaz
1996-04-24		This life I lead
1996-04-27		Baby don't cry (Keep ya head up II)
1996-05		Hit 'em up (Radio version)
1996-05		Wanted dead or alive
1996-05		Don't go to sleep
1996-05-10		All bout U (Radio version)
1996-05-10		I ain't mad at cha (Clean version)
1996-06		Runnin' on E
1996-06		U don't have 2 worry
1996-06		Whatcha gonna do
1996-06-10		Untouchable
1996-06-10		Why U turn on me
1996-06-10		Untouchable
1996-06-10		Reincarnation
1996-06-11		Street life
1996-06-12	<i>1996-06-12 – 1996-09</i>	Fortune and fame
1996-06-14		Basket case
1996-06-14		My own style

1996-06-15	Military minds
1996-06-15	Brothas 'n' armz
1996-06-15	World wide dime pieces
1996-06-17	Tattoo tearz
1996-06-17	Thug nigga
1996-06-19	Set it off
1996-07	Niggaz nature
1996-07	War games
1996-07-08	Lost souls
1996-07-08	Killuminati
1996-07-08	Fuck friendz
1996-07-08	Lost souls
1996-07-10	Let 'em have it
1996-07-11	Hidden track (Interlude)
1996-07-12	Bomb first (My second reply)
1996-07-12	White man'z world
1996-07-15	Hold ya head
1996-07-17	To live & die in L.A.
1996-07-18	Krazy
1996-07-18	Watch ya mouth
1996-07-22	The good die young
1996-07-27	Pac's life
1996-07-29	Street fame
1996-07-30	Life of an outlaw
1996-07-30	Me and my girlfriend
1996-08	Against all odds
1996-08	Blasphemy
1996-08	Hail Mary
1996-08	To live & die in L.A. (Radio version)
1996-08	Life is a traffic jam
1996-08	Never had a friend like me
1996-08	Out the moon (Boom, boom, boom)
1996-08	Smile
1996-08	Black Jesuz
1996-08	Worldwide (remix)
1996-08	One day at a time
1996-08-01	Toss it up (Radio version)
1996-08-08	Toss it up (Video version)
1996-08-10	Toss it up
1996-08-12	Just like daddy
1996-08-12	Ain't nothing wrong (Interlude)
1996-08-13	As the world turns
1996-08-25	High speed
1996-08-29	Catchin feelins
1996-09-06	All out

1996-09-06

Hell 4 a hustler

1996-09-06

Letz get it on (Ready 2 rumble)

SAMENVATTING

Regionale affiliatie speelt een uitermate belangrijke rol binnen de hiphopcultuur. De regio, stad, buurt of zelfs straat waar je vandaan komt vormt een belangrijk onderdeel van de persoonlijke identiteit van velen binnen de hiphopgemeenschap en ze dragen die affiliatie over het algemeen vol trots uit. Een van de manieren om dit te doen is door actief gebruik te maken van je regionale accent. Omdat hiphop in de basis een zwarte subcultuur is, gaat het dan vaak over verschillende regionale accenten van het *African-American English*, de facto de voertaal van hiphop in de Amerikaanse context. Rappers hebben nog een extra manier om te *representen* voor hun stad of regio: specifieke rapstijlen – of *flows* – die geassocieerd zijn met bepaalde regio's en van elkaar verschillen op het gebied van (onder andere) de mate van ritmische en melodische variatie.

Hoewel het inmiddels duidelijk is dat er veel regionale variatie bestaat binnen het *African-American English*, was er tot voor kort nog opvallend weinig bekend over de verschillen in accent tussen twee, zeker in de hiphopcontext, belangrijke gebieden: de Amerikaanse *East Coast* en *West Coast*, twee hiphopregio's die in de jaren 90 lijnrecht tegenover elkaar stonden tijdens de beruchte *East Coast/West Coast* hiphopvete. Een van de doelen van dit PhD-project was om meer duidelijkheid te krijgen over hoe deze twee regionale dialecten van elkaar verschillen in fonologisch/fonetisch opzicht, vooral wanneer ze gesproken worden in de hiphopcontext. Door de spraak van hiphopartiesten uit beide regio's fonetisch te analyseren is allereerst vastgesteld dat *West Coast* klinkers significant langer zijn dan *East Coast* klinkers (hoofdstuk 2). Op prosodisch gebied laten de data zien dat *West Coast African-American English* gekenmerkt wordt door een hogere mate van zowel melodische als ritmische variatie vergeleken met *East Coast African-American English* (hoofdstuk 3). Een perceptieonderzoek met ruim 300 participanten toonde aan dat luisteraars boven kansniveau presteren wanneer ze op basis van enkel spraak moeten besluiten of een spreker uit het oosten of het westen van de Verenigde Staten komt (hoofdstuk 4). De meerderheid van de participanten gaf aan minstens één segmenteel verschil te herkennen tussen *East Coast* en *West Coast African-American English*, maar de verschillen tussen de twee dialecten die het vaakst genoemd werden waren toonhoogte- of ritmegerelateerd. Regelmatig kwam het voor dat de verschillen tussen de twee dialecten die participanten

benoemden niet overeenkwamen met de literatuur, wat suggereert dat luisteraars wel in staat zijn om de accenten van elkaar te onderscheiden, maar tegelijkertijd vaak geen bewuste kennis hebben van *hoe* ze daadwerkelijk van elkaar verschillen.

Net zoals het geval was voor de *East Coast* en *West Coast* dialecten van het *African-American English* was er voorafgaand aan dit PhD-project ook nog zeer weinig bekend over de ritmische en melodische verschillen tussen *East Coast* en *West Coast* rap flows. Door de toonhoogtevariatie in (a capella) rapopnames van 16 *East* en *West Coast* rappers te analyseren met software die normaal gesproken gebruikt wordt voor de analyse van spraak, werd duidelijk dat *East Coast* rap flows aanzienlijk monotoner zijn dan *West Coast* rap flows. Een geheel nieuwe, op MIDI gebaseerde methode is gebruikt om te kijken of *West Coast* rap flows ook gekenmerkt worden door meer ritmische variatie vergeleken met *East Coast* rap flows. Uit deze analyses blijkt dat *West Coast* flows inderdaad ritmisch vrijer zijn (hoofdstuk 3). Dit patroon van grotere ritmische en melodische variatie in de rap van het westen dan in de rap van het oosten komt overeen met de eerdergenoemde ritmische en melodische verschillen in spraak uit die regio's. Dit suggereert dat er voor hiphopmuziek en *African-American English* – zoals eerder voor andere talen (bijvoorbeeld Brits-Engels en Frans) en muzikale contexten (bijvoorbeeld klassieke muziek) is gevonden – een sterke connectie bestaat tussen regionale variatie in taal en muziek (hoofdstuk 3).

De bovengenoemde verschillen tussen de *East Coast* en de *West Coast* – zowel qua spraak als qua rap flows – bieden een unieke invalshoek voor onderzoek naar tweede dialectverwerving, vooral omdat ze actief gebruikt worden door leden van de hiphopgemeenschap om hun regionale identiteit uit te dragen. Wat zou er gebeuren met het accent en de flow van een prominente hiphopartiest wanneer deze naar een andere regio vertrekt en op den duur wil *representen* voor die nieuwe regio? De rapper Tupac “2Pac” Shakur is het ideale subject voor zo’n *case study*. 2Pac groeide op aan de oostkust en vertrok in 1988 op zijn zeventiende naar de westkust, waar hij zich vervolgens zou opwerken tot een hiphopsuperster. Na jaren in goed contact te zijn gebleven met de *East Coast* hiphopscene veranderde dit eind 1994 plotseling na een aanslag op 2Pacs leven in New York. Hij keerde na die aanslag de *East Coast* scene voorgoed de rug toe en ondanks dat hij een geboren New Yorker was, werd hij zelfs de aanvoerder van de *West Coast* scene in een gewelddadig conflict met de *East Coast* scene. 2Pac overleed op 13 september 1996 in Las Vegas na een tweede aanslag op zijn leven. Hoewel deze moord hoogstwaarschijnlijk niet gerelateerd was aan het conflict tussen de *East Coast* en *West Coast* hiphopscenes, is het wel waarschijnlijk dat dit conflict een rol speelde bij de moord op de rapper

Biggie, 2Pacs rivaal uit New York die zes maanden later werd doodgeschoten in Los Angeles.

De diachrone *case study* naar 2Pacs tweede dialectverwerving tussen 1988 en 1996 (hoofdstuk 1 en 5) is in meerdere opzichten interdisciplinair. Zo werd onder andere gebruik gemaakt van inzichten uit *Exemplar Theory* om de richting van 2Pacs eventuele accentverandering te voorspellen, werden *Complex Dynamic Systems Theory*-principes gehanteerd om hypothesen over de instabiliteit van zijn taalsysteem te vormen, en werden ideeën uit de sociolinguïstiek toegepast om momenten in 2Pacs leven aan te wijzen waarop vermoedelijk het tempo van zijn accentverandering zou veranderen. Daarnaast werd 2Pacs dialectverwerving niet alleen vanuit een talig perspectief onderzocht (klinkerduur en prosodie), maar ook vanuit een muzikaal perspectief (flow) om te zien of de eerder gevonden link tussen taal en muziek in de context van het *African-American English* en hiphop ook waarneembaar is wanneer iemand een proces van tweede dialectverwerving doormaakt.

De resultaten van de *case study* laten allereerst zien dat 2Pacs klinkers zoals verwacht geleidelijk steeds langer werden naarmate hij langer in California verbleef. In andere woorden, zijn klinkerduur ontwikkelde zich in de richting van de *West Coast*-norm van langere klinkers. Daarnaast is er steeds meer variatie in zijn klinkerduur te observeren, iets wat kenmerkend is voor een instabiel taalsysteem in flux. Zoals verwacht had de schietpartij in New York en de daaropvolgende rol van *West Coast* aanvoerder die 2Pac op zich nam een effect op zijn spraak: in het laatste jaar van zijn leven steeg het tempo waarin 2Pacs klinkerduur groeide en waren zijn klinkers af en toe zelfs langer dan de klinkers van mensen geboren in het westen (hoofdstuk 1).

Vervolgens is er gekeken naar de ontwikkeling van 2Pacs prosodie en flow, waarbij de verwachting was dat deze allebei een vergelijkbaar patroon zouden vertonen als zijn klinkerduur (hoofdstuk 5). Met andere woorden: de hypothese was dat zowel 2Pacs spraak als zijn rapstijl steeds meer ritmische en melodische variatie zouden vertonen en dat er een duidelijk verschil te zien zou zijn tussen de periodes voor- en nadat hij betrokken raakte bij het *East Coast/West Coast* hiphopconflict. De data ondersteunen grotendeels de hypothese dat zijn spraak en rap zich in de richting van de *West Coast*-normen zouden ontwikkelen. Daarnaast suggereren de data dat er bij 2Pacs talige en muzikale tweede dialectverwerving sprake was van zowel passieve als actieve processen. Vanaf het moment dat hij een duidelijke externe reden had om meer te klinken als iemand uit California, kwam zijn accentverandering in een stroomversnelling terecht. Ook vertoonden 2Pacs prosodie

en flow vanaf dat moment regelmatig zelfs meer variatie dan de norm is in het westen. Dit alles doet vermoeden dat hier sprake is van een bewuste keuze van 2Pac om zijn spraak en rap aan te passen zodat hij zich beter kon positioneren als de aanvoerder van de *West Coast*, een idee dat wordt ondersteund door 2Pacs eigen uitlatingen in interviews. Zo stond 2Pac erom bekend dat hij voor het schrijven van muziek of in voorbereiding op een filmrol vaak de techniek van *method acting* toepaste, een proces waarbij hij zich langere tijd onderdompelde in een andere gemeenschap om onder andere hun manier van praten te leren. Het is dus zeker denkbaar dat 2Pac zijn gewenste positie als leider van de *West Coast* hiphopscene op een vergelijkbare manier benaderde wat betreft zijn eigen accent en rapstijl (hoofdstuk 5). De resultaten van de *case study* naar 2Pacs spraak en rap laten ook zien dat talige en muzikale tweede dialectverwerking in de context van hiphop en *African-American English* een vergelijkbaar patroon volgen qua richting en tempo. Deze bevindingen sluiten aan bij de connectie tussen taal en muziek die in hoofdstuk 3 wordt beschreven.

In dit PhD-project worden taal en muziek geanalyseerd in de context van *African-American English* en hiphop. Het project toont aan dat de *African-American English* dialecten van de *East Coast* en *West Coast* in meerdere opzichten van elkaar verschillen en dat luisteraars de twee dialecten van elkaar kunnen onderscheiden. Ook laat het zien dat *East Coast* en *West Coast* rap flows qua melodie en ritme op dezelfde manier van elkaar verschillen als de dialecten van beide regio's, een bevinding die het idee van een taal-muziek connectie in de context van hiphop en *African-American English* ondersteunt. De uitkomsten van de 2Pac *case study* laten zien hoe tweede dialectverwerving – in talig én in muzikaal opzicht – onderhevig is aan zowel passieve als actieve processen en gepaard gaat met instabiliteit van het taalsysteem. De *case study* laat ook zien hoe betekenisvol deze regionale variatie is voor leden van de hiphopgemeenschap: 2Pac manipuleerde hoogstwaarschijnlijk bewust zijn spraak en zijn rapstijl om overtuigender over te komen als aanvoerder van de *West Coast* hiphopscene. Alleen door gebruik te maken van meerdere theoretische invalshoeken, wetenschappelijke velden, domeinen en onderzoeksmethodes was het mogelijk om de onderzoeksvragen van dit PhD-project te beantwoorden. Daarmee vormt deze dissertatie indirect een pleidooi voor meer interdisciplinaire samenwerking en innovatie in de wetenschap, zeker in een veld als hiphoplinguïstiek.

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