SECOND AFRICAN AMERICAN ENGLISH DIALECT ACQUISITION IN RELATION TO REGIONAL HIPHOP IDENTITY

Presenting an integrated approach to phonological second language and second dialect acquisition

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ABSTRACT
At the core of the present thesis lies the idea that developmental trajectories of people’s phonological second language and second dialect acquisition can only be adequately and comprehensively described, explained, and predicted by means of an integrated approach rather than by approaching the issue from a single perspective. Such an integrated approach is proposed in this thesis, namely one which uses Dynamic Systems Theory to describe change and explain variation, Exemplar Theory to predict the direction of change, and sociolinguistic insights to explain and predict the rate of change over time. To demonstrate the proposed approach, a diachronic case study was conducted on the phonological second African American English dialect acquisition by the late rapper 2Pac, who was born in New York, migrated to California post-puberty, and eventually became the leader of West Coast hiphop. The study’s results support its hypotheses – which were based on the proposed integrated approach – of increasing variability over time, gradual assimilation towards West Coast norms, and a more rapid assimilation to those norms at the end of 2Pac’s life, showing that 2Pac never managed to attain a native-like West Coast African American English pronunciation. On the basis of the 2Pac case study’s results, the proposed integrated approach can therefore be concluded to be promising for the study of phonological second dialect acquisition although the approach does require further development.
INTRODUCTION

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 this observation that lies at the core of the present thesis, the overarching aim of which is to demonstrate that developmental trajectories of people’s second language acquisition (SLA) and second dialect acquisition (SDA) can only be adequately and comprehensively described, explained, and predicted by means of an integrated approach. The main reason for making use of such an integrated approach is to avoid the risk of dismissing variability and failing to notice small yet crucial details because they may not fit within the narrow scope of one given framework. Researchers working within single, isolated frameworks are more prone to overlook details that are not the focus of their framework, or, if they do notice them, dismiss them as being noise, errors, or insignificant outliers, whereas they could have been signs of flaws in their theories. When combining multiple approaches, the risk of this occurring decreases, especially when the respective approaches focus on different aspects of the same problem.

In the present thesis, an integrated approach to phonological SLA and SDA is proposed to allow for accurate description, explanation, and prediction of various aspects of developmental trajectories. This proposed approach comprises a Dynamic Systems Theory dimension, an Exemplar Theory dimension, and a sociolinguistic dimension. In order to demonstrate the extent to which this integrated approach allows for description, explanation, and prediction of developmental trajectories, the proposed approach will be applied to the study of SDA in the context of African American English, since this can be considered an optimal area of investigation for an integrated approach that focuses on minute phonetic differences and sociolinguistic phenomena. The research consists of a case study on the African American rap artist Tupac “2Pac” Shakur’s phonological acquisition of a second African American English dialect, in which the duration of his vowels are analyzed diachronically and compared to data from native speakers of his first and his second dialect.

The current study intends to answer two main research questions. The first of these is a lower level research question related to the specific topic of the case study: considering the importance of regionality in hiphop, how would this impact the second AAE dialect acquisition of a prominent member of the hiphop community who “crosses over” from one region to another? The second research question is a more overarching research question, related to the thesis’s ultimate goal of demonstrating the effectiveness of the proposed
integrated approach: can developmental trajectories of people’s phonological SDA (and SLA) only be adequately and comprehensively described, explained, and predicted by means of an integrated approach, and if so, does an approach consisting of only a DST, an ET, and a sociolinguistic dimension suffice?

**Presenting an integrated approach**

The integrated approach to phonological SLA and SDA that is proposed in this thesis makes use of Dynamic Systems Theory principles to describe change as well as explain and predict variation, Exemplar Theory principles to predict the direction of change, and sociolinguistic insights to explain and predict the rate of change over time. In the following sections, the individual strengths and weaknesses of these three will be discussed in detail followed by a description of how they will interact together in the proposed integrated approach.

**Dynamic Systems Theory**

Dynamic Systems Theory (DST), a theory of developmental psychology, originates from the mathematical construct of Dynamical Systems Theory, which describes the behavior of complex systems such as a double rod pendulum. In essence, Dynamical Systems Theory holds that complex (or dynamical) systems are marked by a complete interconnectedness of their variables, meaning that if a change occurs in a single variable, this will affect all of the system’s other variables in some way. Moreover, this interconnectedness is argued to transfer across ‘system borders’ as well, with each system being a subsystem of another system and hence through its own change over time shifting other systems’ development. From this interconnectedness follows that dynamical systems are highly dependent on initial conditions with even slightly different initial conditions causing for completely different developments, and that as a result of this, it is principally impossible to predict systems’ exact courses of development. This idea came to be known as the “butterfly effect”, a chaos theory concept coined by mathematician and meteorologist Edward Lorenz. Crucial to the understanding of dynamical systems’ unpredictable behavior is that the unpredictability does not stem from random elements, but that dynamical systems are deterministic, meaning that their developments are fully determined by their initial conditions.

The psychological theory of DST differs from its mathematical precursor in that it makes use of qualitative rather than mathematical propositions, but it is similar in the sense that it uses the metaphors of DST to describe complex and seemingly random behavior in
human development. In the context of its application to language development, DST is most notable for its dismissal of the traditional nativist argument that language development is a teleological process (Thelen & Smith, 1994). In other words, it rejects the nativist concept of ultimate attainment, arguing that there is no such thing as a steady end state of development since language constantly evolves, and favors a usage-based account of language development that involves a trial-and-error dynamic to arrive at new developmental stages. This claim is supported by research on for instance language attrition (see Schmid, 2010; 2011 for an overview), the influence of frequently used languages on other languages in bilinguals (e.g. Burrough-Boenisch, 2002; Dussias & Sagarra, 2007), and the diachronic development of lexical and grammatical complexity in academic writing (Trinh, 2011; De Bot, forthc.).

What the findings of the aforementioned studies all have in common is that they are concerned with intraindividual variability in production over time. This concern for variability is shared by DST advocates (e.g. Larsen-Freeman, 1997; De Bot, Lowie, & Verspoor, 2007), for at the foundations of the DST approach lie the notions that fluctuations in variability over time are indicators 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 qualitative developmental change (Lee & Karmilof-Smith, 2002). It is argued that there is always a certain degree of random variability in production (cf. the way in which each instance of a vowel will be somewhat distinct from the next instance of the same vowel spectrally), 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 (Thelen & Smith, 1994; De Bot, Chan, Lowie, Plat, & Verspoor, 2012). 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). Fluctuations of stability and instability are viewed as defining aspects of human development, which is why according to a DST approach to diachronic language development, variability in the various, intertwined systems over time should be studied meticulously.

Due to its broad, all-encompassing scope with a focus on detail and variability, DST 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). However, in spite of its comprehensiveness and attention for detail – or, rather, because of its comprehensiveness and attention for detail – DST 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 e.g. Pierrehumbert et al., 2000), namely that a theory should be predictive. Recall that DST presupposes that the development of dynamic systems is in principle unpredictable (although constrained by the interaction with the environment) and that it attempts to take into account all variables possibly playing a role in this development. Apart from the fact that DST predicts language contact will cause for instability in people’s language systems and hence for increased variability in their production, a DST approach does not allow for the level of abstraction that is necessary for comprehensive prediction to be possible. This is an inherent weakness of the theory, causing its strengths to lie primarily in the descriptive rather than the predictive department.

Exemplar Theory

Exemplar Theory (ET) is a psychological construct which offers an elegant 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). To illustrate, people who are familiar with the canine breeds Bulldog, German Shepherd, and Chihuahua and who have grouped them together in a single category ‘dog’ on the basis of their similarities (e.g. quadruped, fur, barking) are able to recognize that a Golden Retriever also belongs to the ‘dog’ category instead of, say, the ‘cat’ category because it shares these characteristics, even though a Golden Retriever does not look the same as the dog breeds they previously encountered.

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), especially concerning the emergence and development of the vowel space, with specific areas rather than points of the vowel space being associated
with specific vowels (Pierrehumbert, 2001). The size and makeup of the vowel category exemplar clouds is determined by the degree of variation – for instance due to people’s imperfect articulatory motor control – displayed in the instances of the vowels someone has encountered, and with each new perceived exemplar, the nature of its respective cloud in the cognitive landscape is altered slightly. A speaker of English’s exemplar cloud for the vowel category of /æ/, for example, will consist of all of this vowel category’s tokens the speaker has encountered. Each of these tokens carries a wide array of information, for instance on the spectral quality of each token but also on their individual durations, F0 values, which word it was part of, etc., and all of this information is stored in said person’s memory. Despite the fact that the mind’s capability of storing long-term memories of individual examples has been shown to be remarkable (e.g. Johnson, 1997), Pierrehumbert (2001) suggests one should not assume that people have individual memories of every instance of a category. Rather, instances whose differences are too fine for them to be distinguished from each other will be encoded as identical (Kruschke, 1992). An individual exemplar, then, “does not correspond to a single perceptual experience, but rather to an equivalence class of perceptual experiences” (Pierrehumbert, 2001, p. 141).

When discussing the nature of exemplars and exemplar clouds, it is important to note that not all are deemed equally significant. The degree of importance that is assigned to an exemplar – the exemplar’s strength – is assumed to decay over time, and due to this recency effect, the location of an exemplar cloud 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, a phenomenon that has been argued to be one of the principles involved in diachronic language change (Pierrehumbert, 2001; 2006). Moreover, frequency is assumed to be an important factor in exemplar clouds’ relative strength in the sense that exemplar clouds comprising of relatively many tokens will be stronger than clouds with relatively few tokens. This is supported by, for example, a study by Valkenier and Gilbers (2013), who phonetically manipulated the formant values of the Dutch front vowels /i/ and /y/ to make them sound the

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1 One reason why Exemplar Theory is so suitable to be applied to the study of the vowel space is perhaps that the Exemplar Theory metaphor of multiple category clouds occupying distinct spaces on a cognitive map strongly resembles the common visualization of the vowel space as a two-dimensional map along the F1 and F2 parameters.

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, 2013).
same. When listeners were presented with these manipulated stimuli, the vast majority of the manipulated vowels were recognized as belonging to the /i/ category, showing that the /i/ category – which is more frequent than /y/ in Dutch – was more dominant than the /y/ category. Synchronically, exemplars’ strength levels may also differ. Exemplars may be associated with social labels carrying information on the speakers of the tokens (e.g. gender, social position, nationality), and when a child acquires its native language, it will attach greater significance to exemplars it perceives from its parents than to exemplars it perceives from, for example, a store clerk (Nycz, 2013). Extralinguistic factors such as social setting and conversational partners not only play a role in the formation of exemplar clouds (Johnson, 1997, 2006; Pierrehumbert, 2006), but also in speakers’ production, for “depending on the situation, different styles or social settings, different parts of the exemplar category may be targeted” (Sloos, 2013, p. 17).

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 SLA and SDA from a phonological perspective, especially 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. Of course, the person’s original, first language’s exemplars will still continue to play a role – forever, even, should one approach the matter from a critical period perspective – albeit an increasingly less important one. 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. The nature of this assimilation depends on the situation; when the second language has, for instance, slightly more fronted /i/ vowels than the first (e.g. German vs. English; e.g. Bergmann, Gilbers, Nota, Schmid, 2013), the assimilation process might be considered less demanding than when vowel category divisions in the second language are very different from those in the first language (e.g. Dutch learners of English have to divide their Dutch /e/ category – which consists of [ɛ] and [æ] tokens – into two categories, namely /ɛ/ and /æ/; e.g. Schmid, Gilbers, & Nota, 2014).

Like DST, ET is informed by the ambition of providing a comprehensive account of language development. The ET proponent Pierrehumbert (2001), for instance, states that her ET-based model’s aim is to “[specify] all and only the outcomes which are possible in human language” (p. 139), and that ET is capable of predicting which outcomes of language
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development are possible and which are not. However, this is not the case, as illustrated by empirical evidence from SLA research. Recall that ET can elegantly explain and predict gradual intraindividual assimilation as stemming from the exemplars of the new dialect or language becoming more prominent and the exemplars of the first dialect or language fading into the background of the learner’s mind. It cannot, however, explain the fact that second dialect or 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 (see, for example, Foreman, 2003; Schmid et al., 2014). In fact, ET would predict that this is an impossible outcome, 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 cannot meet its goal of providing a full account of language development.

Sociolinguistic dimension

Theories such as DST and ET focus primarily on how new language varieties are acquired on a cognitive level, but this is arguably only one side of the coin; while SLA and SDA must be constrained by aspects of the linguistic system, social factors also play a significant role (Nycz, 2013). Sociolinguistic approaches to phonological SLA and SDA 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 (e.g. regional, racial, gender), and speakers’ (desired) positions within their respective communities of practice and speech communities profoundly impact the process of their 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 for 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. Moreover, Nycz (2013) found that the degree of stereotypicality of certain dialect features may cause them to be more resistant to processes of attrition than less stereotypical features of that same dialect – Canadians who emigrated to New York lost their relatively non-stereotypical Canadian low back vowel contrast (caught versus cot) but retained their highly stereotypical Canadian raising features in pronunciation – showing that society’s attitudes toward language variety features influence rates of acquisition or retention.
A negative aspect of the sociolinguistic approach to SLA and SDA is that many sociolinguistic studies make use of a binary, subjective approach to assessing learners’ attainment levels. According to Siegel (2010), sociolinguistic studies typically do not make use of the laboratory phonology (see Pierrehumbert et al., 2000) techniques that DST and ET do, and rather collect tokens of specific phonetic variables, assess for each of these tokens whether they were pronounced according to the norms of the first or the second language or dialect, and then calculate percentages to assess the degree to which someone has acquired the norms of the new variety. Tokens are hence not phonetically measured, leaving no room for intermediate pronunciations to be incorporated in the analysis of learners’ attainment levels. In addition, since it is the researcher who determines according to the norms of which language variety a particular token was pronounced, these assessments are inherently subjective, since the researcher’s own speech sound categories will always interfere in these judgments.

Conclusively, this section shows that the incorporation of a sociolinguistic dimension can 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. However, typical sociolinguistic studies on accent are subjective and fail to see the details of pronunciation in the absence of the usage of laboratory phonology techniques, and hence, making use of only a sociolinguistic dimension in the study of phonological SLA and SDA is not sufficient for an accurate understanding of the topic.

**Interaction between approaches**

The key observation to be made from the sections on DST, ET, and sociolinguistic insights regarding phonological SLA and SDA is that neither of these can provide a full account of human language development by itself. While DST’s ability to diachronically describe language development in great detail and its attention for increased variability as a sign of increased instability are exceptional, it allows for little prediction and, as such, is flawed as a comprehensive theory of language development. ET, on the other hand, does allow for prediction of language development, but largely ignores the details that DST focuses on, most notably variability phenomena. Moreover, its explanation of language development on the basis of exemplars clouds cannot account for overshooting effects that have been observed in the literature, and although ET does acknowledge that extralinguistic information may play a role in exemplar cloud formation, it is unable to take human agency into account as a full-fledged factor influencing developmental trajectories. The sociolinguistic insights (e.g.
motivation, identity) that were discussed do take human agency in consideration, although on their own they do not offer the insights into the fundamental cognitive processes at play that DST and ET do.

What is apparent from the previous paragraph is that DST, ET, and the sociolinguistic dimension in a sense counterbalance each other, their individual strengths neutralizing the others’ weaknesses; while on their own they are flawed, combined into one integrated approach, they make for a solid theory of language that is more comprehensive than each of them individually could ever be. In this integrated approach, the DST perspective is used to describe diachronic change and to predict fluctuations in variability as resulting from contact with language norms other than the learner’s first language variety. Secondly, the ET perspective will be used to predict the direction of change over time as stemming from exposure to other language norms. Finally, sociolinguistic insights will be used to predict the rate of change over time as a result of, for instance, motivation levels.

Second African American English dialect acquisition

Second dialect acquisition

The current thesis focuses on a special subtype of SLA – the process of acquiring a second language (L2) in addition to one’s first language (L1) – namely SDA, i.e. the type of SLA which occurs “when the relationship between the L1 and the L2 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” (Siegel, 2010, p. 1). In such situations, the L1 can be referred to as a person’s first dialect (D1), and the L2 can be referred to as his or her second dialect (D2).

From a purely linguistic perspective, it is difficult if not impossible to distinguish between what constitutes a language and what constitutes a dialect. One could argue that the difference can be found in the degree of mutual intelligibility, the idea being that two different dialects of the same language are mutually intelligible whereas two different languages are not. However, since this does not always apply – see, for example, mutual intelligibility studies for Scandinavian languages (e.g. Van Ommen, Hendriks, Gilbers, Van Heuven, & Gooskens, 2013) – the definition of a dialect that will be used throughout this thesis is one that is not so much linguistic as it is social in nature, reflecting people’s attitudes regarding
different language varieties. Different dialects can be distinguished from each other in terms of vocabulary, grammar, pragmatics, and pronunciation, the latter of which is the most salient to most people, who “most often refer to the different ways of pronouncing words, or what is usually referred to as ‘accent’,” when discussing dialectal differences (Siegel, 2010, p. 9). Dialects can be divided into three broad categories: national dialects, regional dialects, and social (or ethnic) dialects. National dialects are the language varieties that are characteristic of particular countries, such as Australian English, Canadian French, or Brazilian Portuguese. Regional dialects are those dialects associated with particular areas of a country, for example the New York accent or the Newcastle accent. Finally, social or sociocultural dialects are language varieties that are associated with the speech of certain social or ethnic groups, for instance Chicano Spanish or Native American English (Siegel).

The present study is concerned with phonological SDA in a context related to social and regional dialect categories: the acquisition of a second regional dialect of African American English (itself a sociocultural dialect of American English), specifically the SDA of West Coast African American English for a speaker with East Coast African American English as his D1. The motivation for selecting such a context is that there are few, if any, language varieties like African American English for which regional differences are so subtle, yet so important to its speakers on a cultural level (especially regarding the East Coast-West Coast divide), making it an optimal area of investigation to demonstrate the proposed integrated approach.

**African American English regional dialects**

Few varieties of English have been studied as much as African American English (AAE), the social dialect of English spoken by African Americans. AAE – which has gone by many names such as African American Vernacular English and Black English, and is perhaps best known in society as Ebonics – became the centerpiece in the sociolinguistic fight against popular beliefs of language diversity that has been waged from the 1960s onward. 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 (e.g. by showing that AAE’s

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3 Cf. the famous aphorism that a “language is a dialect with an army and a navy,” which is often attributed to the Yiddish linguist Weinreich.

4 See, for instance, the Oakland Ebonics controversy (Rickford, 1999; Baugh, 2000) and the song “Ebonics (Criminal Slang)” by Harlem rap artist Lamont “Big L” Coleman (2000).
copula deletion as in *He nice* was the result of the same process that leads to the standard variety’s copula contraction as in *He’s nice*). However, in their zealous attempts to eradicate the tenacious myths of linguistic folklore surrounding AAE, which often requires exaggeration and simplification in order to get one’s points across, sociolinguists have themselves constructed different myths about AAE (Wolfram, 2007).

*The supraregional myth*

Arguably the most pervasive of these myths about AAE is what Wolfram terms the “supraregional myth” – the idea that AAE is a regionally homogeneous language variety. This myth of regional homogeneity stems already from the first descriptive studies of AAE (e.g. Labov, Cohen, Robins, & Lewis, 1968; Wolfram, 1969; Legum, Pfaff, Tinnie, & Nichols, 1971; Fasold, 1972; Labov, 1972), which concluded that the structural features of AAE were shared across AAE-speaking communities regardless of regional context. Labov (1972), for instance, described AAE as follows:

> By [AAE] we mean the relatively uniform dialect spoken by the majority of black young in most parts of the United States today, especially in the inner city areas of New York, Boston, Detroit, Philadelphia, Washington, Cleveland, Chicago, St. Louis, San Francisco, Los Angeles, and other urban centers. (p. xiii)

Focused on making a clear case that AAE was not a substandard version but rather an equal, social dialect of American English, sociolinguists ignored regional differences that in retrospect were already apparent from the earliest studies on AAE, dismissing them as incidental or irrelevant (Wolfram, 2007). Thus, they shaped the description of AAE for decades to come, overshadowing the work of linguists who did acknowledge the regional heterogeneity of AAE. Lisa Green, for instance, postulated the following:

> [T]here are regional differences that will distinguish varieties of AAE spoken in the United States. For example, although speakers of AAE in Louisiana and Texas use very similar syntactic patterns, their vowel systems may differ. Speakers of AAE in areas in Pennsylvania also share similar syntactic patterns with speakers in Louisiana and Texas; however, speakers in areas in Pennsylvania are not likely to share some of the patterns that the Louisiana and Texas speakers share with other speakers of southern regions. (Green, 2002, p. 1)
In line with Green’s example, more recent studies have shown regional differences across AAE varieties in North Carolina (Mallinson & Wolfram, 2002; Wolfram & Thomas, 2002; Wolfram, 2003; Childs & Mallinson, 2004; Carpenter, 2004, 2005; Childs, 2005; D’Andrea, 2005; Rowe 2005; Mallinson, 2006), whereas others compared the regional differences between Midwest AAE and the AAE of the Southern states (Pollock & Berni, 1997; Hinton & Pollock, 2000) or report on differences between East Coast AAE and West Coast AAE (Morgan, 2001; Cutler, 2007). At the present, the general consensus among linguists is that although AAE may not be as regionally heterogeneous as for example the dialects of English spoken in the United Kingdom, significant differences regarding lexicon, syntax, and phonology can be observed for AAE across the United States.

**AAE in relation to hiphop’s focus on regional identity**

A description of regional varieties of AAE is not complete without taking into account the relevance of the differences between these to their speakers. In this respect, the African American cultural movement of hiphop plays a significant role due to its intricate relationship with AAE, the language primarily associated with hiphop (Smitherman, 1997; Morgan, 2001; Cutler, 2007). Region and place are central to hiphop culture and the identity of its members (Morgan, 2001; Hess, 2009), and because of its competitive nature, hiphop facilitates a sense of local pride causing hiphop artists and aficionados 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, or any one of New York City’s five boroughs, or even a specific neighborhood” (Hess, 2009, p. viii). Representing particular regions or cities invokes a social experience shared with other hiphop community members from those respective places, linking one to the tradition of that region. However, in accordance with hiphop’s central concept of authenticity – “keeping it real” – pretending to be from a different region than one actually is can cost one’s entire reputation and cause someone to become ostracized by the rest of the community (Rickford & Rickford, 2000; Cutler, 2007; Hess, 2009).

Initially, however, hiphop culture was not as widespread yet as it is today, and New York City had a regional monopoly on hiphop culture ever since the early 1970s, when it emerged on the streets of the Bronx and subsequently invaded New York’s other boroughs. New York’s hiphop hegemony began to wither in the mid-1980s, when hiphop culture was exported across the United States to the West Coast. There, a raw version of hiphop distinct from New York’s arose – the so-called ‘gangsta rap’ movement. Influenced by the extreme
territorialism of Los Angeles street gang culture, a desire emerged among the members of the new West Coast hiphop community to assert themselves as distinct from the New York hiphop community (Forman, 2002; Hess, 2009). As Morgan (2001) puts it, “[f]or the first time, the [hiphop] community had to consciously address whether the emergence of different regional styles constituted a split in the [hiphop] nation” (p. 193). Such a split did indeed occur, most obviously in the 1990s, when tensions between the West Coast and the East Coast increased. For example, rappers from both coasts disrespected each other on songs, record label executives from Bad Boy Records (New York) and Death Row Records (Los Angeles) ridiculed each other, and East Coast crowds booed highly successful West Coast artists such as Calvin “Snoop Doggy Dogg” Broadus when they came to perform in New York (Hess, 2009). By the end of the 1990s, the conflict between the two coasts had receded (although it would never disappear completely), and other regions such as the South and the Midwest started gaining popularity as well, creating their own regional styles and cultures (Cutler, 2007).

As stated above, one of the ways of expressing regional identity and affiliation in hiphop is by referencing the names of regions, cities, boroughs, streets, and neighborhoods (Hess, 2009). Another is through one’s appearance, for instance by means of clothes, jewelry or tattoos. According to Morgan (2001), however, usage of one’s regional AAE variety is the prime means of expressing regional identity and affiliation, arguing that “in [hiphop] 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). Members of the hiphop community are aware of phonological differences between regional dialects of AAE in particular and make use of regional phonological features to distinguish regional differences.

**Phonetic regional differences**

Considering that only recently, the linguistic community became aware of the fact that there are regional dialects of AAE, not much research has been conducted on how regional AAE dialects differ from each other regarding pronunciation. Nevertheless, some information is available, and the reported phonetic contrasts between East Coast AAE and West Coast AAE, the dialects in focus for the present study, are presented in Table 1.
Table 1: Overview of reported phonetic differences between East Coast AAE and West Coast AAE (Morgan 1993, 1998, 2001; Alim, 2004; Cutler, 2007).

<table>
<thead>
<tr>
<th>Feature</th>
<th>East Coast AAE</th>
<th>West Coast AAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vowel duration</td>
<td>Relatively short</td>
<td>Relatively long</td>
</tr>
<tr>
<td>Intervocalic /t/</td>
<td>Glottalized</td>
<td>Flapped</td>
</tr>
<tr>
<td>Pronunciation of ‘man’</td>
<td>/mæn/</td>
<td>/mən/ (Bay Area, CA)</td>
</tr>
</tbody>
</table>

Case study

This thesis comprises a diachronic case study on the African American rap artist Tupac “2Pac” Shakur’s phonological acquisition of West Coast AAE as a D2 with East Coast AAE as his D1. An integrated approach consisting of a DST, ET, and sociolinguistic dimension is used to predict the development of his SDA process. The phonetic variable in focus is the duration of his vowels – which are longer in West Coast AAE than in East Coast AAE (Morgan 1993, 1998, 2001; Cutler, 2007; see above) – in naturalistic speech production, which is analyzed diachronically over a period of 8 years (1988-1996).

Case study subject: Tupac “2Pac” Shakur

The motivation for selecting the African American hiphop artist Tupac “2Pac” Shakur as the case study subject for the present study is multifold and strongly related to the reasons for selecting second African American English dialect acquisition as the context for developing and demonstrating the proposed integrated approach to language development. First of all, after puberty, 2Pac migrated from the East Coast of the United States to California, thus becoming exposed to a different regional variety of African American English than he was exposed to while growing up. Secondly, 2Pac played a significant role in the East Coast-West Coast hiphop rivalry during the 1990s. Considering the importance of regional identity in hiphop culture and the key role language plays in this respect (Morgan, 2001), the sociolinguistic dimension of SDA is expected to be particularly relevant for studying 2Pac’s language development over time. Thirdly, from a methodological perspective, 2Pac is an optimal candidate to be studied diachronically because there is a vast amount of speech material available from the moment he moved 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 (for a discussion on the nature of the recordings that were
used, see the Materials section below). In the following section, a brief description of 2Pac’s life is presented, focused on events and developments throughout his lifespan that may be relevant to 2Pac’s language development.

**Biography**

Tupac Amaru Shakur, more commonly known by the pseudonym 2Pac, was a highly successful and influential African American gangsta rap artist as well as an actor and civil rights activist. Born on June 16, 1971 in East Harlem, New York City as the son of a mother and father who were both active and prominent members of the militant Black Panther Party, 2Pac grew up in a context of sociopolitical activism and poverty. After moving around the East Coast of the United States multiple times during childhood and puberty – initially within the borders of New York City (e.g. Harlem and The Bronx) and then to Baltimore, Maryland at age 14 – 2Pac moved to Oakland, California in 1988 at age 17. There, he became increasingly involved with the black civil rights movement as well as African American hiphop street culture, and 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 cooperated with artists and producers from New York.

As his success and his fame grew exponentially, so did his legal problems and the controversies surrounding him. 2Pac was involved in several violent incidents such as an attempted assassination on his life that left him severely wounded right before he was incarcerated at Clinton Correctional Facility on a sexual abuse conviction in 1995. After serving 11 months there, bail of $1.4 million was posted for 2Pac by the CEO of Death Row Records, the leading West Coast gangsta rap music label at the time, on the condition that 2Pac would sign to his label. 2Pac agreed to this condition, and upon regaining his freedom moved to Los Angeles, California to work on his next album. Fueled by his new affiliation with Death Row Records and the fact that he suspected a number of New York hiphop artists – most notably Brooklyn rapper Christopher “The Notorious B.I.G.” Wallace – to be involved in the earlier attack on his life, 2Pac became increasingly hostile towards East Coast hiphop culture and more overtly affiliated himself with West Coast hiphop. As such, 2Pac, who was originally from New York, ironically became the West Coast’s leading figure in the East Coast-West Coast hiphop rivalry of the mid-1990s.

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 (see Figure 1).
Figure 1: Album cover for 2Pac’s All Eyez on Me (1996), on which he poses making the West Coast “W” hand sign while showing off a Death Row Records necklace.
2Pac’s sudden break away from East Coast hiphop culture is illustrated by a comparison of his lyrics from before and after his signing with Death Row Records. On his song “Old School” (1995), which was recorded in 1994 before he signed with Death Row Records, he overtly pays homage to New York hiphop culture. In contrast, throughout his first single released at Death Row Records, “California Love” (1995), 2Pac “represents” for California’s hiphop culture while simultaneously bashing New York’s. The contrast between these two is clear, but nevertheless, 2Pac struggled with his regional identity and allegiance ever since moving to the West Coast, which is understandable considering hiphop’s focus on regionality, authenticity, and the fact that representing another region than one is originally from is often criticized. 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. On Me Against the World, I took a whole song [“Old School”] to give it up. 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 [The Notorious B.I.G., born and raised in Brooklyn] saying “Brooklyn in the house” every fucking show he do? (...) Why is it not hiphop when I do it?

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).

On September 7, 1996, at age 25, after attending a boxing match in Las Vegas, Nevada, 2Pac became the victim of a drive-by shooting that caused him to die six days later. Although neither the shooter nor the reason for the attack were ever officially identified, it has often been speculated that the homicide was a direct consequence of the regional hiphop rivalry, especially in light of the murder of 2Pac’s adversary The Notorious B.I.G. at age 24 six months later (George, 1998; Morgan, 2001; Hess, 2009; Cramer & Hallett, 2010).

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5 The phrase “to give props” is hiphop slang for “to give credit” or “to pay respect”.

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Hypotheses

On the basis of 2Pac’s biographical information, and the proposed integrated approach’s DST (variation), ET (direction of change), and sociolinguistic perspectives (rate of change), and reported differences between East Coast AAE and West Coast AAE, the following hypotheses were made concerning the diachronic trajectory development of 2Pac’s acquisition of West Coast AAE vowel duration norms and the difference between West Coast AAE and East Coast AAE regarding vowel duration.

Hypothesis 1: Increased variability in production over time from 1988 onward

The first hypothesis originates from the DST perspective of the proposed integrated approach. DST predicts that exposure to another language variety will cause instability in a person’s language system. Recall that at the foundations of the DST approach to SLA and SDA lies the idea that a language system’s stability is inversely related to variability in production, meaning that the less stable a language system is, the more variability will be apparent in language production. In the case of 2Pac, this would entail that until 1988 – the year he moved to California – his language system would be relatively stable as it had not yet been exposed to another regional dialect of AAE. From 1988 onward, however, he became increasingly exposed to another regional dialect of AAE, causing his language system to become more unstable, and hence causing an increase in variability for his production of the vowel duration variable.

Hypothesis 2: Assimilation towards West Coast AAE norms from 1988 onward

The second hypothesis originates from the ET perspective of the proposed integrated approach. ET predicts that continued exposure to exemplars from another language variety will affect the respective individual’s exemplar cloud categories, with the new variety’s exemplars becoming more prominent and the original variety’s exemplars fading into the background. This means that in production, said individual will gradually assimilate towards the norms of the new variety. For 2Pac, this would entail that until 1988, his exemplar clouds would be shaped in accordance with East Coast AAE norms (i.e. relatively short vowels), and that from 1988 onward, as he is continuously exposed to West Coast AAE vowels, he would gradually assimilate towards West Coast AAE norms for vowel length (i.e. his vowels would gradually become longer over time).
**Hypothesis 3: Increased rate of assimilation from late 1995 onward**

The third hypothesis originates from the sociolinguistic dimension of the proposed integrated approach. This sociolinguistic dimension holds that an increased desire to belong to a certain speech community corresponds to an increased motivation to acquire the language variety spoken by that speech community and hence leads to an increased rate of acquisition. In the case of 2Pac, this notion is hypothesized to play an important role from late 1995 – when 2Pac signed to Death Row Records, hence affiliating himself more overtly with West Coast hiphop culture and distancing himself from that of the East Coast – onward; this would entail that as his desire to belong to the West Coast hiphop speech community increased, so would the rate of his hypothesized assimilation to West Coast AAE norms for vowel duration (see Hypothesis 3).

**Hypothesis 4: Incomplete acquisition of West Coast AAE norms**

The fourth hypothesis is based on 2Pac’s continuous struggle with his regional identity and affiliation, and entails that in the eight years that he lived on the West Coast, he was unable to acquire the West Coast AAE norms to such a degree that his speech would be indistinguishable from a native speaker of West Coast AAE. This incomplete acquisition could surface in two ways. Firstly, since 2Pac was torn between the two coasts, he might have held on to his original East Coast AAE exemplars too vehemently to completely assimilate to West Coast AAE norms, and his explicit alliance with the West Coast from late 1995 onward might have lasted too short for his language system to arrive at a stable, attractor state. In other words, regarding both degree of assimilation as well as degree of variability, 2Pac would be hypothesized not to have reached native speaker levels. This first kind of incomplete acquisition will henceforth be referred to as ‘Hypothesis 4a’. Secondly, it could be that in order to compensate for the fact that he was actually from the East Coast, 2Pac began overshooting the West Coast AAE norms upon allying himself more overtly with the West Coast from 1995 onward. If this were the case, 2Pac would produce even longer vowels than

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6 Recall the “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?” lyrics on the song “Thug Style” (1997).

7 Note that this hypothesis is not informed by a critical period perspective (e.g. Lenneberg, 1967) but rather by sociolinguistic and temporal factors. In other words, it does not necessarily entail that 2Pac would have been unable to ever acquire a native pronunciation; it entails that he died too soon for this goal to be accomplished, regardless of whether complete acquisition was ever possible or not.
the norms of West Coast AAE would dictate. This second kind of incomplete acquisition will henceforth be referred to as ‘Hypothesis 4b’.

**Hypothesis 5: West Coast AAE vowels longer than East Coast AAE vowels**

The fifth and final hypothesis concerns the assumption that in West Coast AAE, vowel duration is generally longer than in East Coast AAE, a difference between the two dialects which, as mentioned earlier, has been reported in multiple sources (e.g. Morgan, 2001; Cutler, 2007). However, these sources’ reports were all anecdotal in nature. In other words, they did not support the reported difference regarding vowel duration between East Coast AAE and West Coast AAE with objective phonetic measurements as assessed using laboratory phonology techniques. Hypothesis 5 follows their anecdotally reported claim, as it holds that phonetic measurements will confirm West Coast AAE’s vowels are longer than those of East Coast AAE.

**Hypothesized developmental trajectory**

When combining the aforementioned hypotheses into one comprehensive prediction of the developmental trajectory of 2Pac’s SDA of West Coast AAE vowel duration – as is the aim of the proposed integrated approach – a picture as portrayed in Figure 2 emerges. It shows a stable period in terms of mean vowel length and variation in accordance with East Coast AAE norms up until 1988, increased variation from 1988 onward (Hypothesis 1), a gradual assimilation in the direction of West Coast AAE norms from 1988 until 1995 (Hypothesis 2), and an increase in the rate of assimilation from 1995 onward (Hypothesis 3). Moreover, Hypothesis 4 is reflected in the fact that the West Coast AAE norms are never fully achieved and in the fact that 2Pac’s language system is still not as stable as it was before his migration to the West Coast. Finally, Hypothesis 5 – namely that West Coast AAE indeed has longer vowels than East Coast AAE – is reflected in the fact that the hypothetical baseline for West Coast AAE is set higher than the one for East Coast AAE.
Figure 2: Predicted developmental trajectory (schematic) of 2Pac’s vowel duration (mean and range); the horizontal, dark gray dashed line indicates a hypothetical West Coast AAE baseline, and the horizontal, light gray dashed line indicates a hypothetical East Coast AAE baseline.
METHOD
Below, detailed descriptions are provided for the nature of the materials – more specifically the corpora – used in this study and how these were created, the techniques used to collect data from the corpora, and the methods of analyzing these data.

Materials

Tupac Shakur Audio Corpus
For the present study, an audio corpus of naturalistic speech by 2Pac was created. The corpus consists of eight relatively long recordings (ranging in length from approximately 19 minutes to approximately 58 minutes) of interviews with 2Pac conducted in the period from 1988 until 1996. Appropriate recordings – i.e. recordings that were of sufficient length (to contain enough tokens for analysis) and quality (to be suitable for phonetic analysis) – were found for each year in the period from 1988 until 1996 except for 1990. For this reason, the year 1990 was excluded from analysis, as no recordings could be obtained featuring enough tokens. Moreover, recordings were not selected if music was playing in the background during the interview (as is the case for many radio interviews). Since the interviews 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, however, controlled for speech rate by randomly selecting three five-second samples of uninterrupted speech by 2Pac, assessing the amount 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 (JND) in speech rate perception as reported by Eefting and Rietveld (1989) so that average speech rates were allowed to be in the range of 4.775-5.225. An overview of the details of the corpus’s recordings is presented in Table 2.

Table 2: Details on interview recordings selected for the Tupac 2Pac Audio Corpus.

<table>
<thead>
<tr>
<th>Year</th>
<th>Setting, interlocutor(s), and general impressions</th>
<th>Speech rate (syll/sec)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>Filmed interview, not for (live) television. Topics include</td>
<td>5.000</td>
<td>35:54</td>
</tr>
</tbody>
</table>
2Pac’s upbringing as the son of two Black Panther activists, his acting, and rather mundane topics (e.g. quitting from his job at a pizza place). Interviewers are two white teachers of 2Pac’s at Tamalpais High School in Marin City (Oakland), California (one male and one female). 2Pac appears to speak rather politely, stylistically accommodating to his interlocutors who are his superiors in the school. This difference in stature is also apparent from 2Pac’s comments. For example, when criticizing the school system, he jokingly says that he hopes he will not get in trouble because of his remarks.

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**1989**
Live radio interview. Interviewed by Bomani Bokari, a black radio host at the radio station WRFG (based in Atlanta, Georgia). Other interlocutors include listeners (all African American) calling in to wage in on the conversation and/or ask 2Pac questions. Conversational topics are all related to the black civil rights movement (e.g. racial profiling and police brutality, restaurants refusing to serve African Americans, changing one’s slave name into an African name) as 2Pac was invited because he was the newly elected National Chairman of the New Afrikan Panthers.

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**1991**
Interview (unclear whether for radio or different media, no footage). Interviewed by an unnamed music journalist (relatively young black male) from Oakland, California. Topics include 2Pac’s recent album *2Pacalypse Now* (1991) and upcoming movie *Juice* (1992), controversies surrounding him (being assaulted by Oakland police officers), and how 2Pac is not fond of regional divides in hiphop.

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**1992**
Interview for radio (not live; includes level checks, for instance). Interviewed by an unnamed music journalist (black male). The primary topic of conversation is 2Pac’s album *2Pacalypse Now* (1991) and his movie *Juice* (1992).

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**1993**
Interview through telephone for an article in the music
magazine Rolling Stone. Interviewed by Chuck Philips, a white, middle-aged male journalist. 2Pac appears agitated and tired, responding sarcastically to the interviewers’ questions at the beginning of the interview. As Philips states himself: “At the time of the interview, Tupac was pissed at me – due primarily to my coverage of a 19-year-old car thief named Ronald Howard, who was subsequently executed by the State of Texas for a murder that law enforcement blamed on Tupac’s ‘cop-killing’ lyrics” (2012). Later on, 2Pac appears to open up more, and the conversation continues more smoothly. Topics include 2Pac’s music, his political views, and controversies surrounding him.

Interviewed by Ed Gordon, a black, male talk show host in his thirties for BET (Black Entertainment Television). Topics include the black civil rights struggle and controversies surrounding 2Pac (e.g. being beaten by police, accusations of sexual abuse), causing 2Pac to appear quite angry throughout the interview.

1995  Filmed interview conducted at Clinton Correctional Facility while 2Pac was still incarcerated there. Interviewed by an unnamed, middle-aged, black male journalist. 2Pac appears very calm throughout the interview. Topics include 2Pac’s experiences in prison, his success as an artist and the controversies surrounding him.

1996  Filmed interview for an article in the hiphop magazine Vibe. 5.000  24:10
Interviewed by an unnamed young female journalist. Other interlocutors are members of 2Pac’s entourage present at the interview and a young friend of 2Pac’s who calls him on his phone during the recording. 2Pac appears very hyperactive and angry when answering the interviewer’s questions – at times even yelling – and joyful when interacting with his entourage in person and friend over the phone. The primary
The topic of the interview is the personal conflict between 2Pac and The Notorious B.I.G. and the East Coast-West Coast hiphop feud.

The eight audio recordings of the various interviews with 2Pac were obtained by either downloading them directly from the internet (in Wave format), or by separating the audio (in Wave format) from the footage of YouTube videos using the program Free Studio (DVDF Video Soft). Subsequently, using Audition 3.0 (Adobe Systems), the recordings were converted from stereo to mono (22.05 kHz sample rate), subjected to a restorative process (noise reduction) to enhance the quality of the recordings, and finally normalized for amplitude.

East Coast AAE/West Coast AAE Baseline Corpus

To establish East Coast AAE and West Coast AAE baselines for vowel duration, an audio corpus was created consisting of interview recordings featuring naturalistic speech from two New York rappers (Shawn “Jay-Z” Carter and Christopher “The Notorious B.I.G.” Wallace; both born and raised in Brooklyn, New York City, New York) and two Los Angeles rappers (O’Shea “Ice Cube” Jackson and Andre “Dr. Dre” Young; born and raised in respectively South Central Los Angeles, California and Compton, California). These speakers were selected on the basis of three criteria. Firstly, all of them were African American speakers of either East Coast AAE or West Coast AAE. Secondly, all four are (or were) influential hiphop artists, and, as such, all four can be considered deeply embedded in hiphop culture. Thirdly, none of them ever represented for another city than they were born. As such, they are demographically speaking very similar to 2Pac except for the fact that 2Pac moved from one dialect region to another and began representing for that new region. Therefore, the four rappers can thus be considered appropriate control subjects to base a baseline corpus on.

For each speaker, one recording was obtained, amounting to a total of four recordings (two per dialect). The recordings were selected according to the same criteria as described above for the Tupac Shakur Audio Corpus, and they were obtained, processed, and enhanced in similar fashion as the recordings for the Tupac Shakur Audio Corpus were. An overview of the details of the corpus’s recordings is presented in Table 3.
Table 3: Details on interview recordings selected for the East Coast AAE/West Coast AAE Baseline Corpus.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Setting, interlocutor(s), and general impression</th>
<th>Speech rate (syll/sec)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jay-Z (2010)</td>
<td>Live radio interview for the show Fresh Air on NPR (National Public Radio). Interviewed by white radio hostess Terry Gross (in her late fifties). Interview was conducted in a quiet setting (i.e. no other people present, no music playing, etc.) and both speakers were very calm and polite to each other throughout the interview. The topics of conversation include Jay-Z’s book <em>Decoded</em> (2010), his lyrics, music, and growing up in Brooklyn’s Marcy projects.</td>
<td>4.867</td>
<td>45:53</td>
</tr>
<tr>
<td>The Notorious B.I.G. (1995)</td>
<td>Filmed interview in a relaxed setting. Interviewed by an unnamed male interviewer. Topics include The Notorious B.I.G.’s career as a rapper, whether he views himself as a role model or not, and the state of hip hop, including his conflict with West Coast rappers such as 2Pac.</td>
<td>5.200</td>
<td>09:56</td>
</tr>
<tr>
<td>Dr. Dre (1997)</td>
<td>Filmed interview for the feature documentary <em>Rhyme &amp; Reason</em> (1997). Interviewed by Peter Spirer, a middle-aged, white, male filmmaker. Topics include Dr. Dre’s work as a producer, the record business, and rap music’s past, present and future.</td>
<td>5.200</td>
<td>30:06</td>
</tr>
<tr>
<td>Ice Cube (1991)</td>
<td>Television interview for Dutch public broadcasting (VPRO; ‘Liberal Protestant Radio Broadcasting Corporation’). Interviewed by Jaap Boots, a Dutch, white male journalist (30 years old) in the city center of Rotterdam, the Netherlands. Topics include Ice Cube’s lyrical content and views on racial injustice in America.</td>
<td>5.133</td>
<td>08:56</td>
</tr>
</tbody>
</table>
Phonetic analysis

The recordings of both the Tupac Shakur Audio Corpus and the East Coast AAE/West Coast AAE Baseline Corpus were analyzed for vowel duration in the TRAP vowel (see Wells, 1982 for a discussion of lexical sets). The motivation for selecting vowel duration as the variable of investigation was twofold. Firstly, the difference between East Coast AAE and West Coast AAE regarding the vowel duration variable is the most widely and robustly reported difference between the two dialects, hence making it a good first choice to study. Secondly, vowel duration is a one-dimensional variable in the sense that it is only governed by one parameter: time. In contrast, variables related to the spectral quality of the vowel space, for instance, are two-dimensional since they are governed by the $F_1$ and $F_2$ parameters. Therefore, diachronic development of the vowel duration variable can be more clearly visualized than the diachronic development of other two-dimensional or even three-dimensional phonetic variables. This is of vital importance to the present study, the overarching aim of which is to provide a clear demonstration of what its proposed integrated approach is able to do in practice; only with a one-dimensional variable such as vowel duration can a clear, two-dimensional visualization of development over time as in Figure 2 (see above) be created.\footnote{The idea is that although the integrated approach does allow and in fact will be very useful for the study of diachronic development in two-dimensional phonetic variables, it is better to introduce the new approach using a one-dimensional variable.}

Since the duration of vowels’ is affected by their postvocalic contexts, different analyses were done for vowels followed by voiceless consonants (hereafter: voiceless postvocalic context) (e.g. ‘black’) and vowels followed by sonorants (hereafter: sonorant postvocalic context) (e.g. ‘gang’).\footnote{Originally, a voiced obstruents postvocalic context for TRAP vowels (e.g. ‘bad’) was also planned to be incorporated in this study, but because not enough tokens could be obtained from all recordings in order to allow for reliable diachronic comparison and in order to create a representative baseline corpus, this postvocalic context was not included in the analysis.} Concerning the Tupac Shakur Audio Corpus, 20 tokens were manually (i.e. not by means of scripts) collected for each postvocalic context per year so that 40 tokens in total were analyzed per recording. Only in the case of the sonorant postvocalic context for the 1991 recording of the Tupac Shakur Audio Corpus, less than 20 tokens were collected, namely 18, and as a result, only 38 tokens in total were collected. Concerning the East Coast AAE/West Coast AAE Baseline Corpus, for each postvocalic context, 20 tokens were manually collected from one recording per speaker, resulting in 40 tokens.
TRAP vowel tokens per speaker and a 160 in total. Tokens of the TRAP vowel were only collected and included for analysis if they occurred in stressed or focused position.

Acoustic measurements were conducted using the program 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 several types of information. Firstly, vocal fold vibration was used as an indicator of starting and end points and was assessed on the basis of visual inspection of oscillograms and spectrograms as well as through the ‘show pulses’ function of PRAAT. However, since sonorants (and voiced obstruents) are, like vowels, characterized by vocal fold vibration, starting and end points of vocal fold vibration can only be considered conclusive cues of vowels’ starting and end points when vowels occur word-initially, when they are preceded by a voiceless consonant, when they are followed by a voiceless consonant, or when they occur word-finally (the latter of which is not a postvocalic context considered in this study). Therefore, information on formants as retrieved by examination of spectrograms was used to determine starting and end points of vowels that did not occur in the contexts where vocal fold vibration provided conclusive cues. For the present study, this entails contexts where vowels are preceded by a sonorant or voiced obstruent, and/or followed by a sonorant.

**Descriptive statistical analysis**

For each recording and for each postvocalic context of both corpora, descriptive statistics were assessed for the collected vowel duration data. These descriptive statistics include mean, median, minimum duration, maximum duration, range, standard deviation, and coefficient of variation (CoV). The latter is a normalized measure of dispersion of a frequency distribution that is defined as the ratio of the standard deviation to the mean (N. Segalowitz, Poulsen, & S. Segalowitz, 1999; N. Segalowitz & Hulstijn, 2005), and was assessed in order to allow for fair comparison of multiple recordings’ variation in production when these recordings’ means differ strongly in size. Aside from analyzing the raw measurements for mean, range, and CoV diachronically, these measurements were also smoothed so that outlier noise in the data was limited and general patterns of development and trends could more clearly be observed. This smoothing of the data was performed by taking the values measured for any given year and averaging it with those of the year directly preceding and the year directly following it (Lowie, p.c.).
In order to establish a baseline for East Coast AAE TRAP vowel duration, the descriptive statistics for the New York speakers (i.e. Jay-Z and The Notorious B.I.G.) were averaged. To establish such a baseline for West Coast AAE, the same was done for the Los Angeles speakers (i.e. Dr. Dre and Ice Cube).

RESULTS

In this section, results for the TRAP vowel measurements for both the Tupac Shakur Audio Corpus and the East Coast AAE/West Coast AAE Baseline Corpus are presented.

Tupac Shakur Audio Corpus

The descriptive statistics for the voiceless postvocalic context of the Tupac Shakur Audio Corpus are presented in Table 4.

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
<th>SD</th>
<th>CoV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>170.10</td>
<td>174.50</td>
<td>125</td>
<td>222</td>
<td>97</td>
<td>25.951</td>
<td>0.1525</td>
</tr>
<tr>
<td>1989</td>
<td>132.65</td>
<td>138.00</td>
<td>101</td>
<td>162</td>
<td>61</td>
<td>18.692</td>
<td>0.1409</td>
</tr>
<tr>
<td>1991</td>
<td>136.10</td>
<td>131.50</td>
<td>103</td>
<td>203</td>
<td>100</td>
<td>23.766</td>
<td>0.1746</td>
</tr>
<tr>
<td>1992</td>
<td>142.55</td>
<td>131.00</td>
<td>112</td>
<td>238</td>
<td>126</td>
<td>34.321</td>
<td>0.2386</td>
</tr>
<tr>
<td>1993</td>
<td>150.80</td>
<td>146.00</td>
<td>108</td>
<td>200</td>
<td>92</td>
<td>29.721</td>
<td>0.1970</td>
</tr>
<tr>
<td>1994</td>
<td>147.85</td>
<td>136.50</td>
<td>106</td>
<td>286</td>
<td>180</td>
<td>40.521</td>
<td>0.2740</td>
</tr>
<tr>
<td>1995</td>
<td>153.50</td>
<td>145.00</td>
<td>110</td>
<td>263</td>
<td>153</td>
<td>32.855</td>
<td>0.2140</td>
</tr>
<tr>
<td>1996</td>
<td>183.75</td>
<td>176.50</td>
<td>119</td>
<td>304</td>
<td>185</td>
<td>43.851</td>
<td>0.2386</td>
</tr>
</tbody>
</table>

The mean and range of 2Pac’s TRAP vowel duration in the voiceless postvocalic context (in ms) are presented visually in Figure 3a and Figure 3b (raw data and smoothed data respectively).\(^\text{10}\)

\(^{10}\) Note that the graphs from Figure 3a onward do include 1990 on the horizontal axis despite the fact that no data were collected for this year. The reason for doing so is that if 1990 were to be omitted from the timeline, the illusion might be created that the development from 1989 until 1991 took place in not two but in merely one year. The data points for the year 1990 are consistently the same as those for 1989.
Figure 3a: Mean and range for 2Pac’s production of vowel duration in ms – TRAP; voiceless postvocalic context (raw data).

Figure 3b: Mean and range for 2Pac’s production of vowel duration in ms – TRAP; voiceless postvocalic context (smoothed).
Regarding the development of the mean, Figure 3a shows an initial drop in vowel duration from 1988 until 1989, after which a steady growth can be observed with an increase in the rate of development in the direction of longer vowels. Regarding range, an increase over time can be observed, albeit a rather erratic pattern. In Figure 3b, this erraticness is largely removed as a result of the smoothing process, and a clearer picture of gradual increase in terms of mean and range can be observed.

The descriptive statistics for the sonorant postvocalic context of the Tupac Shakur Audio Corpus are presented in Table 5.

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
<th>SD</th>
<th>CoV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>153.80</td>
<td>149.50</td>
<td>118</td>
<td>192</td>
<td>74</td>
<td>24.473</td>
<td>0.1591</td>
</tr>
<tr>
<td>1989</td>
<td>144.40</td>
<td>144.50</td>
<td>100</td>
<td>181</td>
<td>81</td>
<td>22.779</td>
<td>0.1577</td>
</tr>
<tr>
<td>1991</td>
<td>154.33</td>
<td>157.50</td>
<td>118</td>
<td>196</td>
<td>78</td>
<td>26.228</td>
<td>0.1699</td>
</tr>
<tr>
<td>1992</td>
<td>162.50</td>
<td>154.50</td>
<td>108</td>
<td>238</td>
<td>130</td>
<td>39.692</td>
<td>0.2446</td>
</tr>
<tr>
<td>1993</td>
<td>178.05</td>
<td>185.50</td>
<td>106</td>
<td>252</td>
<td>146</td>
<td>41.662</td>
<td>0.2340</td>
</tr>
<tr>
<td>1994</td>
<td>161.70</td>
<td>154.00</td>
<td>127</td>
<td>245</td>
<td>118</td>
<td>33.363</td>
<td>0.2063</td>
</tr>
<tr>
<td>1995</td>
<td>164.20</td>
<td>160.00</td>
<td>116</td>
<td>243</td>
<td>127</td>
<td>37.107</td>
<td>0.2260</td>
</tr>
<tr>
<td>1996</td>
<td>194.65</td>
<td>196.00</td>
<td>111</td>
<td>307</td>
<td>196</td>
<td>47.602</td>
<td>0.2446</td>
</tr>
</tbody>
</table>

The mean and range of 2Pac’s TRAP vowel duration in the sonorant postvocalic context (in ms) are presented visually in Figure 4a and Figure 4b (raw data and smoothed data respectively).
Figure 4a: Mean and range for 2Pac’s production of vowel duration in ms – TRAP; sonorant postvocalic context (raw data).

Figure 4b: Mean and range for 2Pac’s production of vowel duration in ms – TRAP; sonorant postvocalic context (smoothed data).
Regarding the diachronic development of the mean, Figure 4a shows a steady growth with a slight decline from 1994 until 1995, after which the mean grew again to beyond pre-1994 levels. Regarding range, a steady increase over time can observed with a minor increase in the rate of change from 1995 onward. In Figure 4b, as a result of the smoothing process, this minor increase disappears, and what remains is a very stable picture of growth over time for mean as well as range.

In Figure 5a and Figure 5b (raw data and smoothed data respectively), the CoV values for the voiceless and the sonorant postvocalic contexts over time are presented together.
**Figure 5a:** CoV for 2Pac’s production of TRAP vowel duration; voiceless and sonorant postvocalic contexts (raw data).

**Figure 5b:** CoV for 2Pac’s production of TRAP vowel duration; voiceless and sonorant postvocalic contexts (smoothed data).
Figure 5a shows a general pattern of growth for both postvocalic contexts, which seem to be slightly different on the basis of the irregular patterns of the two in the period between 1992 and 1995. However, as evidenced by Figure 5b, smoothing out the CoV data for both contexts results in a picture that shows that the two contexts’ developmental trajectories are, generally speaking, very similar to each other; from 1988 until 1993, steady growth can be observed, which seems to stall from 1993 onward, remaining at nearly double the 1988 value.

East Coast AAE/West Coast AAE Baseline Corpus

The descriptive statistics for the voiceless postvocalic context of the East Coast AAE/West Coast AAE Baseline Corpus are presented in Table 6, and those for the sonorant postvocalic context are presented in Table 7.

Table 6: Descriptive statistics for the East Coast AAE/West Coast AAE Baseline Corpus in ms – TRAP; voiceless postvocalic context.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
<th>SD</th>
<th>CoV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jay-Z</td>
<td>134.35</td>
<td>132.50</td>
<td>108</td>
<td>161</td>
<td>53</td>
<td>15.059</td>
<td>0.1121</td>
</tr>
<tr>
<td>Notorious B.I.G.</td>
<td>141.75</td>
<td>136.00</td>
<td>111</td>
<td>197</td>
<td>86</td>
<td>23.416</td>
<td>0.1652</td>
</tr>
<tr>
<td>Dr. Dre</td>
<td>166.85</td>
<td>145.50</td>
<td>119</td>
<td>306</td>
<td>187</td>
<td>51.257</td>
<td>0.3072</td>
</tr>
<tr>
<td>Ice Cube</td>
<td>180.35</td>
<td>159.00</td>
<td>120</td>
<td>382</td>
<td>262</td>
<td>59.609</td>
<td>0.3305</td>
</tr>
</tbody>
</table>

Table 7: Descriptive statistics for the East Coast AAE/West Coast AAE Baseline Corpus in ms – TRAP; sonorant postvocalic context.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
<th>SD</th>
<th>CoV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jay-Z</td>
<td>153.50</td>
<td>147.50</td>
<td>112</td>
<td>200</td>
<td>88</td>
<td>27.266</td>
<td>0.1776</td>
</tr>
<tr>
<td>Notorious B.I.G.</td>
<td>155.00</td>
<td>148.00</td>
<td>108</td>
<td>258</td>
<td>150</td>
<td>34.734</td>
<td>0.2241</td>
</tr>
<tr>
<td>Dr. Dre</td>
<td>185.95</td>
<td>164.50</td>
<td>122</td>
<td>308</td>
<td>186</td>
<td>53.288</td>
<td>0.2866</td>
</tr>
<tr>
<td>Ice Cube</td>
<td>192.00</td>
<td>185.50</td>
<td>112</td>
<td>362</td>
<td>250</td>
<td>65.923</td>
<td>0.3434</td>
</tr>
</tbody>
</table>

The descriptive statistics averaged per coast are presented in Table 8 for the voiceless postvocalic context and in Table 9 for the sonorant postvocalic context.
Table 8: Descriptive statistics averaged per coast in ms – TRAP; voiceless postvocalic context.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
<th>SD</th>
<th>CoV</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Coast</td>
<td>138.05</td>
<td>134.25</td>
<td>109.50</td>
<td>179</td>
<td>69.50</td>
<td>19.237</td>
<td>0.1386</td>
</tr>
<tr>
<td>West Coast</td>
<td>173.60</td>
<td>152.25</td>
<td>119.50</td>
<td>344</td>
<td>224.50</td>
<td>55.433</td>
<td>0.3189</td>
</tr>
</tbody>
</table>

Table 9: Descriptive statistics averaged per coast in ms – TRAP; sonorant postvocalic context.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
<th>SD</th>
<th>CoV</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Coast</td>
<td>154.25</td>
<td>147.75</td>
<td>110</td>
<td>229</td>
<td>119</td>
<td>31.000</td>
<td>0.2009</td>
</tr>
<tr>
<td>West Coast</td>
<td>188.98</td>
<td>175.00</td>
<td>117</td>
<td>335</td>
<td>218</td>
<td>59.605</td>
<td>0.3150</td>
</tr>
</tbody>
</table>

From Table 8 and Table 9, two things stand out. First of all, for the voiceless postvocalic context, on average, the mean vowel duration values for the East Coast subjects ($M = 138.05$) were lower than those of the West Coast subjects ($M = 173.60$), and the same is the case for the sonorant postvocalic context, with the East Coast subjects’ mean vowel duration values on average being lower ($M = 143.25$) than the West Coast subjects’ ($M = 188.98$). Secondly, for both the voiceless and the sonorant postvocalic context, the West Coast’s CoV values ($M = 0.3189$ and $M = 0.3150$ respectively) are, on average, larger than their East Coast counterparts ($M = 0.1386$ and $M = 0.2009$ respectively).

Comparison of 2Pac and baseline corpus

The mean of 2Pac’s TRAP vowel duration in the voiceless postvocalic context (in ms) is presented visually in Figure 6a and Figure 6b (raw data and smoothed data respectively) alongside the East Coast AAE and West Coast AAE baselines for this context.
Figure 6a: Mean for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms – TRAP; voiceless postvocalic context (raw data).

Figure 6b: Mean for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms – TRAP; voiceless postvocalic context (smoothed data).
As Figure 6a shows, in 1988, the mean for 2Pac’s production of TRAP vowel duration in the voiceless postvocalic context is just below the West Coast AAE baseline, after which it decreases spectacularly to a level below the East Coast AAE baseline in 1989. From that moment onward, it increases again, thus gradually moving toward the West Coast AAE baseline until this growth stalls in the period from 1993 until 1995. From 1995 until 1996, however, a steeper climb can be observed than in the period from 1989 until 1995, with 2Pac’s mean value for 1996 even exceeding the West Coast AAE baseline. Due to the applied smoothing process, the stall in growth from 1993 until 1995 and the steeper growth from 1995 until 1996 are no longer observable in Figure 6b, which instead shows a trend of just gradual assimilation towards West Coast AAE norms.

The mean of 2Pac’s TRAP vowel duration in the sonorant postvocalic context (in ms) is presented visually in Figure 7a and Figure 7b (raw data and smoothed data respectively) alongside the East Coast AAE and West Coast AAE baselines for the sonorant postvocalic context.
Figure 7a: Mean for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms – TRAP; sonorant postvocalic context (raw data).

Figure 7b: Mean for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms – TRAP; sonorant postvocalic context (smoothed data).
Figure 7a shows that in 1988, the mean for 2Pac’s production of TRAP vowel duration in the sonorant postvocalic context is on the level of the East Coast AAE baseline, and that after a slight decrease from 1988 until 1989, gradual growth towards the West Coast AAE baseline can be observed until 1993. From 1993 until 1994, it decreases again to near-East Coast AAE levels, only to grow even slightly beyond West Coast AAE norms from 1995 until 1996 at a faster pace than the one observed between 1989 and 1993. As was the case for Figure 6b, the smoothed developmental trajectory displayed in Figure 7b does not show clear declines in duration or faster rates of change, instead showing a general, relatively stable upward trend from 1988 until 1996.

In Figure 8a and Figure 8b (raw data and smoothed data respectively), the CoV values for the voiceless postvocalic context over time are presented together with the East Coast AAE and West Coast AAE baselines for CoV in the voiceless postvocalic context.
Figure 8a: CoV for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms – TRAP; voiceless postvocalic context (raw data).

![Raw Data Graph]

Figure 8b: CoV for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms – TRAP; voiceless postvocalic context (smoothed data).

![Smoothed Data Graph]
Figure 8a and 8b, first of all, show that West Coast AAE has a greater degree of variation for vowel duration in the voiceless postvocalic context than East Coast AAE does. Secondly, they show that 2Pac’s variability regarding vowel duration begins at a level that is similar to the East Coast AAE baseline for CoV in the voiceless postvocalic context. Then, it increases over time, but never quite reaches the West Coast AAE baseline, ending up about halfway between the two baselines.

In Figure 9a and Figure 9b, the CoV values for the sonorant postvocalic context over time are presented together with the East Coast AAE and West Coast AAE baselines for CoV in the sonorant postvocalic context (raw data and smoothed data respectively).
Figure 9a: CoV for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms - TRAP; sonorant postvocalic context (raw data).

Figure 9b: CoV for 2Pac’s production of vowel duration compared to East Coast AAE and West Coast AAE baselines in ms - TRAP; sonorant postvocalic context (smoothed data).
Figure 9a and 9b show that, as was the case for the voiceless postvocalic context (see Figure 8a and Figure 8b), West Coast AAE has a greater degree of variation for vowel duration in the sonorant postvocalic context than East Coast AAE does. However, this difference is smaller than in the voiceless postvocalic context. Secondly, they show that 2Pac’s variability regarding vowel duration begins at a level that is below the East Coast AAE baseline for CoV in the voiceless sonorant context, and then increases over time, but also never reaches the West Coast AAE baseline.

**DISCUSSION**

In this section, the present thesis’s case study’s methodologies are critically evaluated and its hypotheses are discussed in relation to the results presented above. Moreover, suggestions for future research on the study of 2Pac’s second AAE dialect acquisition and matters related to second AAE dialect acquisition are made. The section concludes with a more general discussion of the proposed integrated approach, reflecting on how successful it was in predicting second AAE dialect acquisition in relation to hiphop culture as attested by this study, and how it could be improved.

**Case study**

In this subsection, various aspects of this thesis’s case study will be discussed. Firstly, the results of the study will be discussed in relation to the five hypotheses presented in the introduction. Secondly, the study’s methodology will be discussed paying detailed attention to the characteristics and flaws of both the Tupac Shakur Audio Corpus and the East Coast AAE/West Coast AAE Baseline Corpus. Finally, suggestions for future research are made on the basis of the study’s shortcomings and unsolved or inconclusive answers.

**Hypotheses**

Below, the present study’s five hypotheses on the developmental trajectory of 2Pac’s acquisition of West Coast AAE and the difference between West Coast AAE and East Coast AAE are evaluated on the basis of the data presented above in the Results section.

*Hypothesis 1: Increased variability in production over time from 1988 onward*

Hypothesis 1 is based on the DST principles that exposure to another language variety will cause instability in someone’s language system, and that a language system’s degree of
stability is inversely related to the variability someone displays in his or her language production. Since 2Pac migrated from the East Coast to the West Coast in 1988 and continued to live there and be exposed to West Coast AAE in the process for the rest of his life, it was thus hypothesized that the variability in his production would increase over time. In order to confirm or reject this hypothesis, data on range, SD, and CoV were examined for 2Pac’s vowel duration production in both the voiceless postvocalic context and the sonorant postvocalic context (see Table 4 and 5 respectively for an overview of these data).

In terms of range, i.e. the difference in ms between the shortest and the longest measurement per year, it is apparent that an increase can be observed for both the voiceless and the sonorant postvocalic context, something which is also apparent from examination of Figure 3a and Figure 3b. A clear increase of range can be observed in the voiceless postvocalic context, for it nearly doubled from 97 ms in 1988 to 185 ms in 1996 – a 90.72% increase over a period of eight years. For the sonorant postvocalic context, a similar, even more extreme pattern can be observed from Figure 4a and Figure 4b, namely from 74 ms in 1988 to 196 ms in 1996 – an increase of 164.86% or over 2.5 times larger in 1996 than in 1988.

Since the range variable does not take into account the role of possible outliers, a more robust measurement of variability is the attested SD in production. For SD, an increase is also clearly apparent for both contexts. For the voiceless postvocalic context, the SD value for 1988 is 25.951, whereas the SD value for 1996 is 43.851 – an increase of 68.98% increase. For the sonorant postvocalic context, the SD value for 1988 is 24.473, whereas the SD value for 1996 is 47.602 – with an even greater increase of 94.51% nearly double of the 1988 value.

Although the SD variable limits the effect of outliers, a comparison of multiple SD values is still imperfect for assessing actual degree of variability because the size of SD values is positively related to the size of the mean. Therefore, the CoV (ratio of the SD to the mean) for each year and each postvocalic context was assessed, as this variable does take into account the size of the mean (see Figure 5a and Figure 5b). For the voiceless postvocalic context, the CoV value for 1988 is 0.1525 and the CoV value for 1996 is 0.2386 – an increase of 56.46% over a period of eight years. For the sonorant postvocalic context, the CoV value for 1988 is 0.1591 and the CoV value for 1996 is 0.2446 – a similar increase of 53.74%.

Table 10 below provides an overview of the percentual increases from 1988 to 1996 for range, SD, and COV as reported above.
Table 10: Overview of percentual growth from 1988 until 1996 in terms of range, SD, and CoV – TRAP; voiceless and sonorant postvocalic contexts.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Voiceless</th>
<th>Sonorant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>90.72%</td>
<td>164.86%</td>
</tr>
<tr>
<td>SD</td>
<td>68.98%</td>
<td>94.51%</td>
</tr>
<tr>
<td>CoV</td>
<td>56.46%</td>
<td>53.74%</td>
</tr>
</tbody>
</table>

From examination of these data, it is evident that the data on percentual increases over time for range, SD, and CoV confirm Hypothesis 1, for 2Pac’s degree of variation regarding the vowel duration variable indeed increased for all three and in both postvocalic contexts. The data in Table 10, moreover, show the importance of using the more reliable CoV variable – which both decreases the effect of possible outliers in the data and eliminates the size of the mean as a confounding factor – for an assessment of variability as it shows both contexts to be quite similar with regards to their percentual increases over time, whereas the other two showed substantial differences between the two, thus allowing for inaccurate conclusions to be drawn.

**Hypothesis 2: Assimilation towards West Coast AAE norms from 1988 onward**

Hypothesis 2 is based on the ET principle that a person’s cloud categories will be affected by continued exposure to exemplars from another language variety in the sense that the original variety’s exemplars will fade into the background as the new variety’s exemplars become more prominent to the respective individual. In practice, this holds that in production, such an individual will gradually assimilate towards the new variety’s norms. Since 2Pac moved from the East Coast to the West Coast in 1988 and was based in California throughout the rest of his life, and since East Coast AAE is reported to have shorter vowels than West Coast AAE, it was thus hypothesized that regarding vowel duration, 2Pac would gradually adapt to the West Coast AAE norms for vowel duration, meaning that his vowels would gradually become longer from 1988 onward. In order to confirm or reject this hypothesis, data on mean vowel duration and maximum vowel duration were examined for 2Pac’s vowel duration production in both the voiceless postvocalic context and the sonorant postvocalic context (see Table 4 and 5 respectively for an overview of these data).

Regarding the development of mean vowel duration from 1988 to 1996, a small overall increase can be observed, something which can also be observed in Figure 3a and 3b (voiceless postvocalic context) and in Figure 4a and Figure 4b (sonorant postvocalic context).
For the voiceless postvocalic context, this increase is from a mean of 170.10 ms in 1988 to a mean of 183.75 ms – an increase of 8.02% – and for the sonorant postvocalic context, this increase is from 153.80 ms in 1988 to a mean of 194.65 ms – a somewhat larger increase of 26.56%. Regarding the development of maximum vowel duration from 1988 to 1996, a similar, albeit stronger, upward trend can be observed. For the voiceless postvocalic context, this increase is from a maximum duration of 222 ms in 1988 to a maximum duration of 304 ms in 1996 – an increase of 36.94% – and for the sonorant postvocalic context, this increase is from a maximum duration of 192 ms in 1988 to 307 ms in 1996 – an even more sizeable increase of 59.90%. An overview of these data is provided below in Table 11.

Table 10: Overview of relative growth (%) from 1988 until 1996 in terms of mean and maximum vowel duration – TRAP; voiceless and sonorant postvocalic contexts.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Voiceless</th>
<th>Sonorant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>8.02%</td>
<td>26.56%</td>
</tr>
<tr>
<td>Maximum</td>
<td>36.94%</td>
<td>59.90%</td>
</tr>
</tbody>
</table>

Although growth from 1988 to 1996 can technically be observed for mean vowel duration and maximum vowel duration in both the voiceless and the sonorant postvocalic context, thus confirming Hypothesis 2, it seems to be somewhat of a stretch to verify this hypothesis when over the course of eight years, mean vowel duration only increased by 8.02% for the voiceless postvocalic context. Closer examination of Figure 3a, however, shows that although overall, an increase from 1988 to 1996 can be observed for mean and maximum vowel duration, a rather steep decline going directly against the general trend of the developmental trajectory can be observed from 1988 until 1989 (namely from 170.10 ms to 132.65 ms, a 22.02% decline). Were this data point treated as an outlier and hence removed from the data set, a considerably different picture would emerge. This is reflected in Table 11, which shows an overview of percentual growth from 1989 until 1996, hence ignoring the percentual decline from 1988 to 1989.

Table 11: Overview of relative growth (%) from 1989 until 1996 in terms of mean and maximum vowel duration – TRAP; voiceless and sonorant postvocalic contexts.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Voiceless</th>
<th>Sonorant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>38.52%</td>
<td>34.80%</td>
</tr>
</tbody>
</table>
Especially for mean TRAP vowel duration in the voiceless postvocalic context, this makes a great difference, for from 1989 to 1996, the percentual growth is not 8.02% but rather 38.52%, hence providing a stronger basis for verifying Hypothesis 2. Of course, following the philosophy of the integrated approach that is proposed in this thesis, it should be noted here that the decline from 1988 until 1989 might not actually be an accidental outlier but rather a meaningful token that may provide crucial insights on a particular detail in the developmental trajectory of 2Pac’s vowel duration acquisition. However, as can be observed from the ‘Setting, interlocutor(s), and general impressions’ column’s entry for 1988 in Table 2, 2Pac appeared to speak rather polite during the recording as he was being interviewed by his teachers, who also happened to be white. He appeared to accommodate his speech towards the interlocutors’ standard variety of American English, and, hence, there is some evidence that this recording may not be entirely representative of the way 2Pac spoke AAE in 1988. However, this evidence is not conclusive, and the case therefore has to be further examined in order to make sure that removing it from the dataset would be a justified decision. Nevertheless, as stated above, growth was observed for all contexts even when including the 1988-1989 data point, and, as such, the data do support Hypothesis 2 either way.

**Hypothesis 3: Increased rate of assimilation from late 1995 onward**

Hypothesis 3 stems from the sociolinguistic dimension of the proposed integrated approach, which holds that an increased desire to belong to a particular speech community corresponds to an increased motivation to acquire that speech community’s language variety, which in its turn leads to an increased rate of acquisition of the new variety’s norms. 2Pac signed to Death Row Records in late 1995, affiliating himself more strongly with West Coast hiphop culture than before and, unlike before, explicitly distancing himself from East Coast hiphop culture. Therefore, it is hypothesized that 2Pac’s motivation to acquire the language variety of the speech community he now more closely affiliated himself with – West Coast AAE – increased from late 1995 onward, thus affecting the rate of assimilation in the direction of West Coast AAE norms (see discussion of Hypothesis 2 above) from that point onward. In order to confirm or reject this hypothesis, data on mean vowel duration were examined for 2Pac’s vowel duration production in both the voiceless postvocalic context and the sonorant postvocalic context (see Table 4 and 5 respectively for an overview of these data).
On the basis of the mean vowel duration data presented in Table 4 and Table 5, percentual growth from each year to the next was calculated for both postvocalic contexts, the results of which are presented in Table 12 and Figure 10 below.

Table 12: Overview of relative growth (%) per year from 1988 until 1996 in terms of mean vowel duration – TRAP; voiceless and sonorant postvocalic contexts.

<table>
<thead>
<tr>
<th>Period</th>
<th>Voiceless</th>
<th>Sonorant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988-1989</td>
<td>-22.02%</td>
<td>-6.11%</td>
</tr>
<tr>
<td>1989-1990</td>
<td>+1.29%</td>
<td>+3.38%</td>
</tr>
<tr>
<td>1990-1991</td>
<td>+1.29%</td>
<td>+3.38%</td>
</tr>
<tr>
<td>1991-1992</td>
<td>+4.74%</td>
<td>+5.29%</td>
</tr>
<tr>
<td>1992-1993</td>
<td>+5.97%</td>
<td>+9.57%</td>
</tr>
<tr>
<td>1993-1994</td>
<td>-1.96%</td>
<td>-9.18%</td>
</tr>
<tr>
<td>1994-1995</td>
<td>+3.82%</td>
<td>+1.55%</td>
</tr>
<tr>
<td>1995-1996</td>
<td>+19.71%</td>
<td>+18.54%</td>
</tr>
</tbody>
</table>
Figure 10:Relative growth (%) for 2Pac’s production of TRAP vowel duration over time; voiceless and sonorant postvocalic contexts (raw data).
Aside from the unexpected 22.02% decline between 1988 and 1989 for the voiceless postvocalic context (see discussion of Hypothesis 2), the most noticeable changes are from 1995 until 1996 in both contexts, for with a 19.71% increase for the voiceless and an 18.54% increase for the sonorant postvocalic context, these are by far the largest yearly increases. Table 13, which presents the yearly averages of relative growth for several periods, shows that when comparing the 1995-1996 growth with the average yearly growth from the period between 1989 and 1995, it can be said that the 1995-1996 growth is almost eight times as large for the voiceless postvocalic context and nearly nine times as large for the sonorant one.

<table>
<thead>
<tr>
<th>Period</th>
<th>Voiceless</th>
<th>Sonorant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988-1996</td>
<td>+0.97%</td>
<td>+2.99%</td>
</tr>
<tr>
<td>1989-1996</td>
<td>+4.77%</td>
<td>+4.36%</td>
</tr>
<tr>
<td>1989-1995</td>
<td>+2.46%</td>
<td>+2.16%</td>
</tr>
<tr>
<td>1995-1996</td>
<td>+19.17%</td>
<td>+18.54%</td>
</tr>
</tbody>
</table>

These data hence support Hypothesis 3. However, it should be noted that the hypothesized post-1995 increase in the rate of assimilation can only be verified on the basis of one data point, which may not be entirely representative of what was going on from 1995 onward. Therefore, Hypothesis 3 can be considered tentatively verified by the results until further examination of 2Pac’s language development can offer a more conclusive answer.

**Hypothesis 4: Incomplete acquisition of West Coast AAE norms**

Hypothesis 4 holds that because of 2Pac’s constant struggle with his regional identity and affiliation, he was unable to become indistinguishable from a native speaker of West Coast AAE. It was, furthermore, hypothesized that this incomplete acquisition of West Coast AAE could surface in two different ways. The first of these options was that by the end of his life, 2Pac’s production of TRAP vowel duration was somewhere between the norms of East Coast AAE and West Coast AAE; this first option was dubbed Hypothesis 4a. The second hypothesized option was that by the end of his life, 2Pac was overcompensating for his East Coast origins by ‘overshooting’ West Coast AAE targets, i.e. produce even longer vowels than the West Coast AAE norms dictate; this second option was dubbed Hypothesis 4b. In order to confirm or reject this hypothesis and its subsidiary hypotheses, data on mean vowel
duration and CoV were examined for 2Pac’s vowel duration production for both postvocalic contexts (see Table 4 and 5 respectively for an overview of these data).

Examination of the raw data graphs featuring a comparison of East Coast AAE and West Coast AAE baselines for mean vowel duration and the developmental trajectory of 2Pac’s mean vowel duration (Figure 6a for the voiceless and Figure 7a for the sonorant postvocalic context) show that in 1996, 2Pac’s mean vowel duration was above the West Coast AAE baseline, thus confirming that he did not perform nativelike, as he overshot the target. Hence, the results support Hypothesis 4, more specifically Hypothesis 4b. It has to be noted here that this overshooting effect is rather small, can only be observed in the 1996 recording, and is no longer apparent in the smoothed graphs (Figure 6b and Figure 7b). As such, it might well be that 2Pac was actually much closer to sounding like a native West Coast AAE speaker than this one data point suggests. Moreover, the West Coast AAE baseline might not be entirely representative of actual West Coast AAE norms, for it is only based on the speech of two people.

Examination of the graphs featuring a comparison of East Coast AAE and West Coast AAE baselines for CoV and the developmental trajectory of 2Pac’s CoV over time (Figure 8a and 8b for the voiceless and Figure 9a and 9b for the sonorant postvocalic context) show that 2Pac’s CoV levels ended up about halfway the East Coast AAE and West Coast AAE CoV norms. In other words, he did not achieve native West Coast AAE levels, and as a result, these data confirm Hypothesis 4, more specifically Hypothesis 4a. However, this result is interesting and potentially problematic for the hypothesis evaluations so far. For one, it was not expected that there would be different CoV norms for East Coast and West Coast AAE (see the suggestions for future research below for a more elaborate discussion on this issue). Secondly, 2Pac’s increased variability as assessed on the basis of an increased CoV over time was assumed to be the result of an increasingly unstable language system, following the DST perspective of the proposed integrated approach (see Hypothesis 1). However, if the CoV norms for East Coast and West Coast AAE are indeed different, this increased variability observed in 2Pac’s speech could be argued not to be the result of an unstable language system, but rather of an (incomplete) acquisition to West Coast AAE norms of variability. This issue needs to be further analyzed in order to find a conclusive answer to this question.

**Hypothesis 5: West Coast AAE vowels longer than East Coast AAE vowels**

Hypothesis 5 originates from the anecdotally reported claim that in West Coast AAE, vowel duration is generally longer than in East Coast AAE (e.g. Morgan, 2001; Cutler, 2007).
Hypothesis 5 follows their assumption, holding that it will be confirmed by phonetic measurements. In order to confirm or reject this hypothesis, data on average mean vowel duration for East Coast AAE (Table 8) and West Coast AAE (Table 9) – which are based on mean vowel duration assessments for Jay-Z and The Notorious B.I.G. (East Coast AAE), and Dr. Dre and Ice Cube (West Coast AAE) (see Table 6 and Table 7 respectively) – were examined.

The results showed that for both postvocalic contexts, West Coast AAE TRAP vowels were found to be longer on average than their East Coast AAE counterparts. The results hence support Hypothesis 5 as they are in line with the anecdotal claims discussed above. It should be noted here, however, that the West Coast AAE and East Coast AAE baselines are of course based on only two speakers each. Although these speakers are prominent leaders of their respective coastal hiphop communities, it is unclear how representative their vowel productions are; the particular recordings used for analysis might be atypical for the speakers’ regular way of speaking (cf. the possible 1988 outlier for 2Pac discussed above), or their regular way of speaking may not actually be typical of that of their broader speech communities. Sample sizes as small as this one do not allow for reliable statistical analysis, and hence no truly meaningful claims can be made yet for the community on the basis of these data. They merely show a trend of West Coast AAE vowels being longer than those of East Coast AAE.

**Methodology**

From a methodological point of view, it can be said that most of the present case study’s flaws are the negative byproducts of the study’s greatest methodological strengths. One of these strengths is the fact that only actual, naturalistic speech data are analyzed in this case study as opposed to speech data that were elicited in a laboratory setting (which can never truly be considered entirely naturalistic). On the one hand, this is arguably the only way to assess what is actually going on in a person’s language system, but on the other hand, it brings a number of issues along with it as well. For instance, one of the downsides of using several (as was the case for this study) existing interview recordings featuring naturalistic speech is that it makes it impossible to control for factors such as interlocutor effects (e.g. ethnicity effects, social hierarchy effects, the effect of the interlocutor’s native language or dialect), setting effects (e.g. in a live radio show, recorded interview for a magazine article), or even effects of the topics being discussed (e.g. controversies, racism, love). Such factors could not and hence were by no means controlled for when selecting recordings for the Tupac Shakur
Audio Corpus and the East Coast AAE/West Coast AAE Baseline Corpus. However, to somewhat counterbalance this flaw, for each recording, some light was shed on potential factors affecting the case study subject’s language production (see Table 2 and Table 3). This proved fairly effective, as it, for instance, provided some clues as to why 2Pac’s production of the vowel duration variable in the 1988 recording was so dissimilar from the way it was expected to be. In this light, it is perhaps interesting to note that in the field of sociolinguistics, an increasing amount of attention is being paid to stylistic variation when studying diachronic language development, with for instance Rickford and Price (2013) stressing the importance of incorporating stylistic variation in an analysis of diachronic language development after they serendipitously noticed their case study subject was a “stylistic chameleon, capable since her teenage years of varying copula absence rates depending on addressee, topic, and projected persona” (p. 143).

Another clear strength of this thesis’s case study is that it considers several data points (eight to be exact) rather than merely two in order to assess development over time. This choice for multiple data points is supported by Rickford and Price (2013), who, in line with the DST tradition of analyzing multiple data points, argue for the inclusion of more than two data points in diachronic language development studies. In light of the sociolinguistic dimension of the proposed integrated approach, the main advantage of incorporating multiple data points is that hypotheses regarding different rates of change at different moments of language development (see Hypothesis 3) can be tested this way, whereas with only two data points, this is per definition impossible. The results of the present study show the value of this, for merely comparing 2Pac’s production of TRAP vowel duration in 1988 and in 1996 would have resulted in a rather skewed view of what was going on with his language system during the period of eight years in between.

A few other methodological issues and/or flaws can be recognized. For one, since vowel duration is dependent on time and hence dependent on speech rate, speech rate has to be controlled for to be able to fairly compare different recordings to each other. From the literature, it is clear that speech rate is related to segment and hence vowel duration, but this is unlikely to be a proportionate relationship, and as such, normalizing vowel duration measurements according to speech rate assessments was impossible. In order to reduce the effects of speech rate on vowel duration, speech rate was controlled for in accordance with the JND principles as formulated by Eefting and Rietveld (1989), but this still leaves relatively sizeable differences between the speech rates of the recordings included in both corpora.
Another methodological issue lies in the fact that the TRAP vowel tokens included for analysis, although all controlled for postvocalic context and in the sense that they were required to occur in stressed or focused position, were not controlled for on lexical grounds. In other words, which word they were a part of was not taken into account. The reason why this is potentially problematic can be found in Pierrehumbert et al. (2000), who explain diachronic processes of lenition in languages to be the result of word frequency: the more frequent a word is, the more susceptible its segments will be to reduction in production (e.g. spectrally and in terms of duration). For the present study, this means that the TRAP vowel tokens collected from highly frequent words (e.g. ‘black’, ‘rap’, ‘gangsta’) might have been structurally shorter than those collected from relatively less frequent words (e.g. ‘yank’, ‘exam’). Given the different recordings’ topics of conversation (see Table 2 and Table 3), highly frequent words such as ‘rap’ and ‘black’ occurred more often in certain recordings than in others, and as such, the mean vowel durations assessed for the recordings may not be equally representative of their respective years’ mean vowel duration values.

A flaw in the case study presented in this thesis that can be solved relatively straightforwardly is the fact that the East Coast AAE/West Coast AAE Baseline Corpus consists of too few speakers per coast and, as such, cannot be considered fully representative of East Coast AAE and West Coast AAE norms. Adding more speakers to the corpus, however, could solve this, as will be elaborated on below.

**Suggestions for future research**

As is evident from the hypothesis evaluations above, the present case study’s results support (in different degrees of certainty) the hypotheses formed using the proposed integrated approach. Despite the fact that it provides many insights into 2Pac’s phonological acquisition of West Coast AAE, however, the case study is still rather limited in scope; it only analyzes the developmental trajectory of one individual’s second AAE dialect acquisition in terms of one variable (for one vowel), and compares this developmental trajectory to the speech of just four control speakers. The case study reported on in this thesis should hence not be considered a complete study on its own, but rather a promising pilot study for a larger research project on second AAE dialect acquisition in the context of hiphop culture on the basis of the proposed integrated approach.

For such a larger project, the case study can and should be expanded in several ways. First of all, not all the reported differences in pronunciation between East Coast AAE and West Coast AAE have been investigated in this case study yet. Vowel duration, for example,
has so far only been studied in multiple postvocalic contexts for the TRAP vowel. This proved a good starting point for investigation, but in order to get a more comprehensive picture of 2Pac’s diachronic development regarding this variable, vowel duration should also be assessed for other AAE vowels such as FLEECE, GOOSE, KIT, DRESS, and LOT. Only this way can it be made sure for the vowel duration variable whether exposure to a new dialect affects all vowels similarly or whether different developmental trajectories can be observed between vowels. Moreover, the literature on dialectal differences for AAE reports on other variables than vowel duration as being distinct for East Coast and West Coast AAE too. 2Pac’s production of these variables, which include the realization of intervocalic /t/ (glottalized in East Coast AAE and flapped in West Coast AAE), should therefore also be investigated diachronically.

Secondly, exhausting the known differences between East Coast AAE and West Coast AAE does not mean that no variables remain for investigation anymore. Recall that only quite recently, linguists became aware of the fact that regional dialects of AAE exist, and that as a result, very little research has been conducted investigating differences in pronunciation between any regional dialects of AAE, let alone differences between West Coast and East Coast AAE. Therefore, using the East Coast AAE/West Coast AAE Baseline Corpus, a wide array of other phonetic variables need to be exploratively investigated to see whether there are other variables for which the dialects differ from each other. Variables to be investigated range from other one-dimensional variables (e.g. voice onset time) to multi-dimensional variables (e.g. the sizes and spectral locations of the vowel exemplar cloud categories in the AAE vowel space). When such differences are found, the Tupac Shakur Audio Corpus can be analyzed for 2Pac’s diachronic development regarding the respective variables.

The suggestions made in the previous paragraph lead to another important suggestion for future research, namely expanding the East Coast AAE/West Coast AAE Baseline Corpus so that it will allow for the creation of more reliable pronunciation norms, i.e. norms that can be statistically extrapolated to the rest of the West Coast AAE and East Coast AAE populations. Recall that in its current form, the baseline corpus consists of merely four speakers (two per coast), and that as a result, no reliable statistics can be run on the data generated by the corpus. Expanding the corpus to include a greater amount of speakers from both coasts (all of which should comply with the standards for inclusion in the baseline corpus as defined above) will eliminate this problem of relatively low representativity.

Considering the importance attached to hiphop in the acquisition of a second AAE dialect – something which appears to be justified judging from the tentative evaluations of
Hypothesis 3 – another feature may be specifically interesting to study. This feature is a suprasegmental one, namely prosody. The concept of prosody – the interaction of rhythm, stress, and intonation in speech – is strongly related to the hiphop concept of “flow” – the way rhythm, pitch, timbre, amplitude, and speech sounds interact in the delivery of rap lyrics. Because rappers are in principle limited in terms of flow by the prosody of the language variety they rap in, distinct flows are often associated with specific countries or regions. For instance, since French is a syllable-timed language, the typical French rap flow is very different from the flows in, say, English or Dutch rap. Considering the fact that, generally speaking, East Coast rappers use a different flow than West Coast rappers do, it may be interesting to see how the different regions’ flows are exactly related to the prosody of their respective AAE regional varieties, and, for the present purposes, how this relationship affected 2Pac’s acquisition of West Coast AAE prosody and the diachronic development of the flow he used in his music. The proposed integrated approach – with its focus on variability, direction of change, and rate of change on the basis of DST, ET, and sociolinguistics respectively – is expected to be highly suitable for predicting diachronic developments in flow as well, as flow operates according to the same principles as prosody.

Both the present case study and all aforementioned suggestions for future research have revolved around 2Pac’s speech behavior as objectively assessed through phonetic measurements. However, in line with the vision that informs the proposed integrated approach – the idea that incorporating as many different perspectives as possible to study a problem allows for more comprehensive and more reliable conclusions to be formed – another perspective needs to be taken into account, namely a perceptual one. Experimental studies such as accent rating experiments (see Schmid & Hopp, 2014) with native AAE speakers from the West Coast and the East Coast should be conducted to investigate whether 2Pac ever managed to come across as a native speaker of his second dialect, and, if so, at which point in his development this occurred. Incorporating such a perspective in the diachronic analysis of 2Pac’s SDA would extend the comprehensiveness of the study as well as make it possible to analyze the relation between 2Pac’s speech production as assessed phonetically and how this speech production is perceived.

**Integrated approach**

In this subsection, the proposed integrated approach is reflected upon in light of its application in the current thesis’s case study on 2Pac’s acquisition of West Coast AAE as a second
dialect. First, the proposed approach’s three dimensions and the motivations for incorporating them in the approach are discussed individually in relation to the findings of the 2Pac case study. Subsequently, an evaluation of the integrated approach in its entirety is presented.

**The integrated approach’s three dimensions**

At the core of the proposed integrated approach lies the DST approach, as some of its fundamental features cause it to be very suitable for studying language development diachronically and in great detail. DST on its own offers a unique way of viewing language development diachronically, especially regarding intraindividual variability in production over time. This is nicely illustrated by the data from the 2Pac case study, which show a structural increase in variability as time progressed. Nevertheless, the 2Pac case study shows that the DST approach on its own is incapable of giving a complete account of language development; had only a DST approach been employed for this case study, the hypotheses and conclusions of the case study would have been less comprehensive and hence less insightful. First of all, because DST is based on the notion that language development is principally unpredictable, a DST-only approach would not have predicted 2Pac’s attested assimilation in the direction of the West Coast AAE pronunciation norms for TRAP vowel duration, nor would it have predicted the observed changes in rate of assimilation towards those norms.11 Descriptively speaking, a DST-only approach would have been fully capable of bringing such assimilation patterns to light, but it would not have been able to offer a thorough explanation as to why these patterns were found, nor would it have predicted them in the first place.

The second pillar of the proposed integrated approach is the ET approach. The reason for incorporating an ET perspective in the proposed approach is that it offers arguably the most elegant account of speech sound category dispersal across the cognitive landscape and how this may shift diachronically. As a result, in contrast to a DST-only approach to the study of 2Pac’s SDA, applying an ET-only approach would have definitely caused for the prediction and confirmation of 2Pac’s assimilation towards the West Coast AAE norms for TRAP vowel duration. However, as would have been the case with taking a DST-only approach for the present thesis’s case study, an ET-only approach would have been limited in several ways as well. Firstly, it would not have taken into account intraindividual variability

11 Note that it did correctly predict the later attested increase in variability over time as resulting from a decrease in stability of 2Pac’s language system.
over time, hence ignoring surface signs of 2Pac’s language system’s instability. Secondly, a continuous, gradual assimilation towards West Coast AAE norms would have been hypothesized with no attention being paid to the possibility of different rates of change throughout 2Pac’s period of acquisition.

Finally, the third pillar of the proposed integrated approach is the sociolinguistic dimension, which was included in the proposed approach because it factors in social human agency in the study of SDA and SLA. It is this social perspective that causes the sociolinguistic dimension to be the missing link for the study of 2Pac’s developmental trajectory; without it, the change in 2Pac’s rate of assimilation towards West Coast AAE norms from 1995 onwards due to an increased motivation to sound like a native speaker of West Coast AAE – a motivation that was hypothesized to increase because 2Pac became the leader of West Coast hiphop – could neither have been predicted nor explained. Unlike the DST and ET perspectives, however, the purely sociolinguistic perspective does not consider any purely cognitive processes involved. In the case of the 2Pac case study, a sociolinguistics-only approach thus would have merely facilitated the prediction of fluctuations in the rate of this assimilation towards West Coast AAE norms. Therefore, it can be said that the sociolinguistic dimension on its own can offer perhaps the least complete account of developmental trajectories for phonological SDA and SLA out of the three approaches here discussed, but that it does make for an invaluable part of the integrated approach here proposed, for without it, markedly simplified and less accurate developmental trajectory would be predicted and reported.

**Evaluation of the integrated approach in its entirety**

In this thesis’s first paragraph, it was stated that the thesis’s main aim was to demonstrate that developmental trajectories of individuals’ phonological SDA (and SLA) can only be accurately and satisfactorily described, explained, and predicted by means of an integrated approach as opposed to an approach involving only a single perspective. As the subsection above makes clear, the hypothesized developmental trajectory portrayed in Figure 2, which was largely confirmed by the 2Pac case study’s results, indeed could only have been predicted, described, and explained using a combination of approaches and not solely on the basis of either a DST, ET, or sociolinguistic approach. The case study results support the notion that the individual strengths of the three subapproaches can neutralize the others’ weaknesses. Hence, the 2Pac case study indeed demonstrates the value of an integrated approach, and the thesis’s main aim can thus be considered accomplished.
It is important to note here that the proposed integrated approach, of course, was not created for the sole purpose of studying 2Pac’s acquisition of West Coast AAE as a second dialect, and that this topic of investigation was merely chosen because it was expected to be suitable for demonstrating the possibilities of the proposed approach, especially concerning the sociolinguistic dimension. The ultimate goal is to construct an integrated approach to studying SDA and SLA that is optimized for all contexts of language development and all individual second dialect or second language learners. The first steps towards achieving this goal have been taken in this thesis, which serves as a first test or a pilot study of the proposed approach. The foundations for making and testing predictions regarding developmental trajectories over time have been laid, but there is no question that the integrated approach will need to be expanded at some point by incorporating insights from other frameworks than already incorporated. For example, theories on style shifting are likely to be required for further analysis as already evidenced by the fact that the 1988 recording for the Tupac Shakur Audio Corpus appeared to differ substantially from the corpus’s other recordings in terms of language style.

Aside from adding more perspectives to the approach in order to expand its comprehensiveness, it is also necessary to examine possible implications that the integrated approach as a whole may have for the theoretical foundations of its individual dimensions. Although the integrated approach combines multiple approaches to phonological SDA and SLA, the approach as it is proposed in this thesis arguably is not truly integrated yet. This is because as of now, the three dimensions cooperate to facilitate prediction, description, and explanation of developmental trajectories, but they do not affect each other yet. The dimensions’ individual strengths are used to counterbalance the others’ weaknesses, but this in itself does not solve the other approaches’ weaknesses; the subapproaches’ combined strength merely masks the individual dimensions’ flaws. The integrated approach in its current state combines the compatible elements of its subapproaches while ignoring the ways in which they contradict each other. For example, the problem of DST’s supposition that language development is inherently unpredictable is solved by adding the predictive components of ET and the sociolinguistic dimension. However, in effect, this brings about a problematic contradiction, namely that the confirmedly predictive integrated approach consists of a theory which principally holds that prediction is impossible. Moreover, ET holds that it is principally impossible for individuals to (structurally) overshoot in their second language or dialect. This causes for a problematic contradiction as well, for the integrated approach’s sociolinguistic dimension holds that overshooting is possible, a position which is
also held by the integrated approach as a whole. The main objective for the future, therefore, is to interweave the various subapproaches into one truly integrated approach by finding ways to solve the contradictions between them and refining the integrated approach’s theoretical foundations.

**CONCLUSION**

Essentially, the present thesis intended to answer two research questions. The first of these was a lower level research question, solely related to the topic of the case study, namely how the second AAE dialect acquisition of a prominent member of the hiphop community who migrates from one region to another would be impacted by hiphop’s strong focus on regionality. Regarding this research question, it can be stated that regional hiphop identity indeed seems to have a substantial effect on the lives of hiphop community members migrating from one region to another, and that, since language plays a vital role in the manifestation of regional hiphop identity, regional hiphop identity may actually affect people’s language development over time: in the case study on 2Pac, it was found that someone’s rate of assimilation towards the pronunciation norms of another region’s AAE variety might be directly related to the degree to which a learner desires to socially assimilate to that region’s hiphop culture.

The second, more overarching, research question of the thesis was related to its ultimate goal – demonstrating the effectiveness of the proposed integrated approach for the description, explanation, and prediction of developmental trajectories of people’s phonological SDA (and SLA) – namely whether developmental trajectories of people’s phonological SDA (and SLA) can be adequately and comprehensively described, explained, and predicted by means of an integrated approach, and if so, whether it would be sufficient if such an approach consisted of only a DST, an ET, and a sociolinguistic dimension. Regarding this research question, it can be concluded that the results from the 2Pac case study confirm that an integrated approach is indeed preferable to isolated approaches for comprehensive description, explanation, and prediction of developmental trajectories: it was shown that neither a DST-only, ET-only, or a sociolinguistics-only approach could have predicted and explained developmental trajectories as accurately as a combination of these three approaches could. However, it was also shown that the proposed integrated approach needs to be expanded; with its three different pillars of DST, ET, and the sociolinguistic dimension, it is capable of bringing to light what happens when people are in the process of acquiring a
second language or dialect better than previous, non-integrated approaches have, but there are a number of factors and phenomena playing a role in SDA and SLA that the integrated approach currently cannot account for yet. Conclusively, it can therefore be stated that this thesis’s results indicate the proposed integrated approach to be promising but requiring of further development.
REFERENCES


