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Many Ways to Sound Diné: Linguistic Variation in Navajo

A dissertation submitted in partial satisfaction

of the requirements for the degree Doctor of Philosophy

in Linguistics

by

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June 2019

The dissertation of Kayla Pearl Palakurthy is approved.

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May 2019

Linguistic Variation in Navajo

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by

Kayla Pearl Palakurthy

For my Diné friends
sik'is Diné danilínígíí

Acknowledgements

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2019	The role of similarity in sound change: Variation and change in Diné affricates. *Penn Working Papers in Linguistics* 25(2). (Forthcoming, Fall 2019).
2019	Prosody in Diné Bizaad Narratives: A Quantitative Investigation of Acoustic Correlates. *International Journal of American Linguistics.* (Forthcoming, Fall 2019)
2019	*Variation in Diné bizaad Collection.* Archived collection at the Alaska Native Language Archive (ANLA). 46 items including audio recordings and transcriptions. Online at https://www.uaf.edu/anla/collections/search/result.xml/index.xml?collection=64.
2018	The Changing Sounds of Exceptionally Aspirated Stops in Diné bizaad (Navajo). *Penn Working Papers in Linguistics*, 24(2).
2018	Syntactic Annotation of a Hupa Text Corpus. *Proceedings of the 2017 Dene (Athabaskan) Languages Conference.* (Co-authored with Justin Spence, Zoey Liu, and Tyler Lee-Wynant).
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HONORS AND AWARDS

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            Salt Lake City, Utah. January 6.
2017   The Changing Sounds of Exceptionally Aspirated Stops in Diné bizaad
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2017   Prosody in Navajo Narratives. Paper presented at the Society for the Study of
            the Indigenous Languages of the Americas annual meeting. Austin, Texas.
            January 8.
2016   Acoustic Evidence for Prosodic Units in Navajo. Poster presented at the
            Acoustical Society of America annual meeting. Honolulu, Hawaii. January
            29.
2016   Marking the Unexpected: Evidence from Navajo to Support a Metadiscourse
            Domain. Paper presented at the Society for the Study of the Indigenous
            Languages of the Americas annual meeting. Washington DC. January 10.

| 2014 | Who authorized the Dartmouth Indian? Voices in the Construction of "Indian as Mascot". Paper presented at the American Anthropological Association annual meeting. Washington DC. December 7. |

Invited talks

| 2018 | The Role of Similarity in Sound Change: Variation and Change in Diné Affricates. Paper presented at Berkeley Phonetics and Phonology Forum. University of California, Berkeley, Berkeley, California. October 15. |
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Other presentations

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PROFESSIONAL SERVICE

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English (native), French (intermediate), Italian (intermediate), Russian (intermediate), Diné bizaad (research knowledge), Tlahuapan Mixtec (research knowledge)

Abstract

Many Ways to Sound Diné:

Linguistic Variation in Navajo

by

Kayla Pearl Palakurthy

Linguistic variation is a fundamental component of human language, and the study of how speakers and listeners ascribe subtle social meaning to linguistic variants has revealed important insights for linguistic theory. Variants also constitute the seeds of potential linguistic changes within a speech community, and patterns of the linguistic and social factors that condition contemporary variation inform what we know about the actuation and diffusion of linguistic changes. However, while sociolinguistic variation has been extensively studied in many monolingual communities speaking large global languages, it is less often studied at the same level of depth in minority languages in multilingual contexts, and relatively few studies have focused on variation and change in Native American languages.

Based on interviews with participants aged 18–75, this dissertation presents an investigation of variation in contemporary Diné bizaad (Navajo), a Southern Dene (Athabaskan) language spoken by over 100,000 speakers dispersed throughout a large area in the present-day American Southwest. Through an analysis of three variable features in the speech of the fifty-one bilingual Diné bizaad-English participants, this project quantitatively

analyzes the linguistic and social factors that condition variation and evaluates evidence for incipient or ongoing changes in these features. Alongside the quantitative analysis, I present a qualitative description of language attitudes and usage among these bilingual speakers.

Chapters 1, 2, and 3 provide the theoretical, sociocultural, and methodological context for this study. Chapter 1 puts forth my approach to analyzing variation and change and describes how I draw on work from the fields of variationist sociolinguistics, language contact, and language documentation. Chapter 1 also includes sociohistorical background on the Diné language and people. Chapter 2 presents an overview of Diné grammar, and chapter 3 an overview of the documentation methods.

Chapter 4 examines the aspiration of /tʰ/ and /kʰ/, famous for their exceptionally long and variably fricated releases. Phonetic analysis indicates that the releases of /kʰ/ have shortened, while releases of /tʰ/ remain long. I argue that the changes in /kʰ/ are motivated by phonological similarity to English [kʰ], while the salience of the stronger affrication of /tʰ/, represented in some earlier descriptions as /tx/, inhibits a similar conflation, and results in a different trajectory of change.

Chapter 5 presents an analysis of variation and change in the laterally-released affricates: unaspirated /t͡l ~ /kl/ and ejective /t͡l'/ ~ /k͡ɬ'/. Results show evidence for two changes-in-progress, of which unaspirated /kl/ is a more recent innovation, propagated by younger speakers. In contrast, the ejective variant /k͡ɬ'/ is produced by speakers of all generations including some older speakers, even those who primarily speak Diné bizaad. These changes are motivated both by phonetic similarity and a high degree of bilingualism in the speech community.

Chapter 6 investigates variation and change in the usage of the multi-functional particle *nít'ę́ę́'* in discourse. The particle functions primarily as a temporal discourse sequencer, often introducing sudden or new events, and as a marker of habitual past. Overall the functions and syntactic distribution of *nít'ę́ę́'* found in these stories are very similar to those recorded in earlier texts, suggesting that the development of these functions is not a new phenomenon. I discuss how an analysis of polygrammaticalization can account for the synchronic functions.

Chapter 7 presents an analysis of prominent contemporary language usage, attitudes, and ideologies that emerge from discussions about linguistic variation and language practices. The results show a more advanced stage of language shift than was observed in earlier studies: Diné bizaad continues to be widely associated with Elders, family, ceremonial practices, and the Navajo Nation government, while speakers of all ages report using English as their primary communicative code. At the same time, Diné bizaad continues to be valued for its expressive and complex nature, its function as a link to Diné identity, and connection to family, especially grandparents. These results are in line with earlier studies foretelling ongoing shift, but the continuity of ideological value may prove useful in ongoing maintenance and revitalization efforts. Finally, chapter 8 summarizes the results and discusses implications for these findings.

Table of Contents

List of Tables

List of Figures

Abbreviations

1	first person
2	second person
3	third person
3a	third person animate
3s	third person space
CLF	classifier
CONJ	conjunction
DEF	definite
DEM	demonstrative
DISTR	distributive
DU	dual
FUT	future
INCEP	inceptive
INDEF	indefinite
ITER	iterative
IPFV	imperfective
MIR	mirative
NEG	negation
NI.PFV	ni- perfective
OBJ	object
PFV	perfective
PL	plural
POSS	possessive
PROG	progressive
PST	past
REL	relativizer
SG	singular
SRO	solid roundish object
SUB	subordinator
THEM	thematic
USIT	usitative

Chapter 1

Introduction

1.1. Overview

Over the past several decades linguistic research has definitively demonstrated that a homogenous speech community is an idealization. Variation between individuals, as well as between sub-groups of a community, is found in all living languages. The ability to appropriately produce and interpret language that may vary in word choice, pronunciation, and grammar is a crucial aspect of linguistic proficiency, and studies continue to reveal the astonishingly detailed and structured manner in which individuals alter their speech in different linguistic or social contexts. Variation is also a necessary precursor to linguistic change, as certain variants may take hold and diffuse more broadly in a speech community. Research on linguistic variation thus provides valuable insight into how language carries social meaning and changes over time.

This dissertation analyzes variation in contemporary Diné bizaad, also known as Navajo, a Southern Dene (Athabaskan) language spoken in the present-day American Southwest. Diné bizaad retains a large and active speaker population of middle-aged and older

speakers, though like many languages indigenous to North America, it is threatened by intergenerational shift to English. In the following chapters I document three variable features in the speech of fifty-one bilingual Diné bizaad-English speakers and investigate the linguistic and social factors that condition the variation. Additionally, I describe participant perceptions of language usage, and variation in the language, and analyze prominent language ideologies that emerge in discussions about Diné bizaad and English. This dissertation brings together approaches drawn from the fields of language documentation, language contact, and sociolinguistics in order to better understand the diverse ways in which this group of Diné speakers continue to adapt and maintain their Diné language at a time of significant sociolinguistic change.

1.2. Summary of Research Goals

The goals of this project are multifold. First, given that most variationist studies are based on larger global languages such as English, this project seeks to expand the typological reach of sociolinguistics by applying quantitative methods to the study of variation and change in an under-described context. The extant vitality of the Diné-speaking community presents the opportunity to apply variationist methods in investigating ongoing changes in the speech of participants from different ages, genders, geographic regions, and sociolinguistic backgrounds. Specifically, I document three linguistic features that vary synchronically and investigate how each variant correlates with linguistic factors and is distributed across different sub-groups. The targeted features include variation in the voiceless aspirated stops /kʰ/ and /tʰ/, variation in the laterally-released alveolar affricates /t͡ɬ/ and /t͡ɬ'/, and variation in the use of the particle *nít'ę́ę́'* in discourse. Based on the distribution of these variants across

speakers of different generations, and a comparison of current patterns with earlier documentation, I evaluate the evidence for changes in these features. Furthermore, an analysis of current perceptions of variation and change provides insight into how social categories are perceived as conditioning variation.

A second goal is to empirically determine the role of language contact as a factor that influences variation in the aforementioned features. In situations of language contact, bilingual speakers often import novel variants across codes with different outcomes based on the sociohistorical context. In these data, I examine how variable patterns across bilinguals with different linguistic and social backgrounds point to evidence that contact with English, alongside internal motivators, is influencing contemporary language usage. Given the range of outcomes recorded for minority language speech communities experiencing intense contact with a socially dominant language, fine-grained studies, such as those presented here, are needed to understand the origins and patterns of diffusion of changes, alongside speakers' perceptions and attitudes towards observed changes. Moreover, analyses in chapters 4 and 5 empirically test previous predictions regarding sound change in minority languages.

Lastly, I aim for this project to constitute a meaningful contribution to the existing documentation of Diné bizaad with stories and perspectives recorded with a variety of speakers. Beyond the Diné language material, language attitude interviews provide insight into how these participants view variation and change in both structure and usage of the language. The recordings and transcripts collected for this study have been archived at the Alaska Native Language Archive and are publicly available to community members, language teachers, and researchers with the hope that this collection may enhance existing pedagogical tools used in language maintenance and revitalization.

The analyses in the forthcoming chapters uncover several findings. In chapter 4, I show that the releases of the Diné stop /kʰ/ have become shorter, while the releases of Diné /tʰ/ remain long. I argue that the changes in /kʰ/ are motivated by phonological similarity to English [kʰ], while speakers do not equate Diné /tʰ/ with English [tʰ]. In chapter 5, analysis reveals two changes in apparent-time: /t͡l/ > /kl/ and /t͡ɬʼ/ > /k͡ɬʼ/. I find that /kl/ is likely a recent substitution from English, introduced by younger speakers. In contrast, speakers of all ages produce the variant /k͡ɬʼ/, which I argue to be a phonetically-motivated change that is favored among speakers in the younger generation. In chapter 6, I propose that the contemporary particle *nít'ę́ę́'* has developed from what was previously a verb and now functions as a temporal sequencer, often introducing sudden events, and as a marker of habitual past. Lastly, in chapter 7, qualitative analysis identifies a consistent perception of regional and generational linguistic varieties, and how Diné bizaad retains prestige in certain domains despite community-wide encroachment from English.

Together, these findings inform theories of sociolinguistics and language contact, while contributing new data and analyses to be used in community efforts to support and maintain Diné bizaad. First, results show that the observed changes are linguistically motivated by language-internal factors, as well as by intense contact with English. While these changes might initially appear to be straightforward examples of Diné convergence towards sounds in English, phonetic analysis of speech produced by speakers of different backgrounds reveals multiple motivators for some innovative variants. Such an approach is rare in research on sound change in endangered languages and thus challenges assumptions about the singular role of language contact in driving change in these contexts. This project also contributes an analysis of a discourse particle, an under-described, but productive area of Diné morphology. The ongoing development of the particle reflects the continued evolution of grammar despite

the threat of language shift. Finally, this dissertation provides contemporary data on self-reported language usage and identifies generational continuity in ideologies towards variation.

In the remainder of this introduction I present the background necessary to contextualize this study. I start in §1.3 with a discussion of my overall approach to linguistic variation and change drawing on usage-based linguistic theories, variationist sociolinguistic methods (§1.3.1), research on language contact (§1.3.2), and previous work on variation in minority languages (§1.3.3). This theoretical introduction is followed in §1.4 with historical background on the Diné language and people and in §1.5 with an outline of the dissertation.

1.3. Language Variation and Change

In this dissertation, I assume a usage-based approach to analyses of linguistic structure and change (Croft 2000; Bybee 2001, 2007, 2010). Under this view, the cognitive representation of linguistic units, be they phonemes, prefixes, or larger verbal constructions, emerges through the storage of individual tokens in a network based on our lived experiences as speakers and listeners. Though there is evidence for abstract levels of storage, speakers are also highly sensitive to fine-grained linguistic and social detail, suggesting that they have access to multiple levels of stored information (Pierrehumbert 2001; Campbell-Kibler 2016). From this perspective, language is not a self-contained, stable system, and community-wide variability is inevitable because speakers will differ in their experiences and representations. Further, linguistic categories are by nature gradient, as speakers must continually accommodate new experiences that expand and blend prior representations of linguistic units (Blevins 2004; Bybee 2010).

New variants—also referred to as innovations (Croft 2000; 2010)—are thought to arise in the speech of individuals or small groups within a community motivated and constrained by cognitive, linguistic, and social factors (Weinreich et al. 1968; Milroy 1992; Labov 1994). In the case of phonetics, variation may be attributed to inter-speaker differences in physiology and articulation, as well as the effects of co-articulation and phonetic reduction that are pervasive in natural speech (Ohala 1989; Labov 1994; Foulkes and Docherty 2006). Grammatical variation may come from stylistic differences in how speakers verbalize events or gradient differences in how speakers analyze the mapping between the form and function of a construction. Additionally, in interaction, speakers may be motivated to innovate out of a desire to express their individuality or creativity, while at the same time balancing a desire to be understood and the pressure to adhere to group norms and established linguistic conventions (Croft 2000; 2010).

Sociolinguists typically consider an innovation to constitute a change once it spreads within the broader speech community or takes hold within a particular sub-group (Weinreich et al. 1968; Milroy 1992; Labov 1994; Poplack and Levy 2010). Though not all variability leads to change, variation plays a primary role in language change at all levels of linguistic structure (Ohala 1989; Labov 1994, 2001; Bybee 2001, 2002; Blevins 2004; Croft 2010). As speakers participate in diverse, interconnected speech communities, innovations may diffuse through individual interactions. Speech community here is understood as, "a grouping of individuals by their participation in a social domain. The social domain can be defined by the shared expertise of the members of the community, by virtue of which the members of the community share common ground (mutual knowledge and beliefs)" (Croft 2000: 166).

While there are many motivators for linguistic innovations, the propagation of linguistic change is primarily a social phenomenon (Croft 2000). For instance, evidence from

research on linguistic accommodation points to one such social mechanism for the spread of innovations; in many studies, individuals are observed to adjust the realization of phonetic or grammatical targets over the course of real-time interaction to align with or diverge from their interlocutors based on their perceived social characteristics (Giles and Smith 1979; Meyerhoff 1998; Hay et al. 1999). Over time the cumulative effect of linguistic alignment or divergence in individual interactions can result in shifts in community-wide language usage even as individuals may remain unaware of changes as they spread.

In the following analyses, I focus on three features with variants that analysis reveals to be sufficiently diffused to be considered changes within the speech of the fifty-one bilingual participants in this study. While the first two features reflect sound changes at both subphonemic and phonemic levels respectively, the third is a grammatical feature that has previously undergone change via grammaticalization, a specific type of change whereby over time a lexical item gradually develops a more grammatical meaning (Hopper and Traugott 2003). In order to better understand the motivations for the innovation and patterns of propagation of each change, it is necessary to closely consider the role of specific linguistic and social factors. In §1.3.1 I discuss the empirical methods used by variationist sociolinguists, and applied in this dissertation, to analyze the relevant interrelated factors.

1.3.1. Variationist Sociolinguistic Methodology

Variation conceived as a subject worthy of study owes much to the substantial variationist sociolinguistic work pioneered by William Labov (1966, 1972, 1994). Central to this approach is the notion that within a speech community, linguistic variation is structured in a way that might not be initially evident, and that through quantitative analysis, scholars can tease apart the ways in which individual linguistic (internal) and social (external) factors condition

7

linguistic variables and the diffusion of changes. While the relevance of internal factors will depend on the selected linguistic variable, research in this paradigm has repeatedly shown the degree to which variation in natural speech correlates with external factors such as socioeconomic class, age, gender, ethnic group, regional dialect, and social network (Trudgill 1983; L. Milroy 1987; Bright 1998; Labov 1994, 2001; Milroy and Gordon 2008).

In an attempt to more accurately convey the dynamicity of intraspeaker variation beyond broad demographic categories, more recent sociocultural approaches to linguistic variation have further demonstrated how speakers alter their language stylistically to index shifting characteristics based on social context (Eckert 2008, 2012), identity construction (Zhang 2005), and alignment with different communities of practice (Bucholtz 1999; Eckert 2000). These and other studies have significantly contributed to what scholars know about the social meaning of linguistic features on a more local level and underscore the prominence of contextualized social meaning in the propagation of change.

Because of the complexity of the interrelated factors conditioning variation, it has become standard practice in variationist sociolinguistics to use statistical methods, especially multivariate regression, to weigh the individual contributions of different linguistic and social factors (Labov 1994; Johnson 2009; Bayley 2013; Scrivner and Díaz-Campos 2016). In this dissertation, I apply statistical methods to investigate how produced variants correlate with social characteristics in particular linguistic environments to determine patterns of diffusion. In the following analyses, I consider the degree to which social factors—age, region, gender, and linguistic background—condition the observed variation.

While structural changes may continue throughout a person's lifetime, linguistic features frequently pattern with numerical age or generational cohort (Labov 2001; Sankoff and Blondeau 2007; Tagliamonte and D'Arcy 2007). The methodology known as the

apparent-time construct stipulates that synchronic differences in linguistic features that pattern with generation may reflect ongoing community-wide changes (Labov 1994; Bailey 2002). When sufficiently similar studies are available, researchers may also compare results to earlier work in order to make claims of real-time change. In this dissertation, I compare my results to previous studies and descriptions, while also appealing to the apparent-time construct when proposing that a change has occurred. I further pair these quantitative results with a qualitative analysis of language attitudes and ideologies in chapter 7 to investigate how speakers themselves perceive and evaluate variation and change. Chapter 3 describes these methods of analysis in greater detail.

Most variationist studies have analyzed variation and change in monolingual speech communities, but there is a growing body of literature focusing on bilingual or multilingual contexts (Ravindranath 2009; Stanford and Preston 2009; Poplack and Levy 2010; Davidson 2015; Nagy 2018). In the forthcoming chapters, I consider the high degree of Diné bizaad-English bilingualism in the community as a potential driver of innovation and change, with the prediction being that linguistic features will vary in the speech of bilinguals with different language backgrounds and attitudes. In §1.3.2 I discuss work on variation and change in multilingual speech communities, and in §1.3.3 I review significant results from studies on variation in minority languages in particular.

1.3.2. Variation and Language Contact

Similar to other kinds of variation and change, innovations that are introduced via language contact are thought to originate in the speech of an individual bilingual, or small group of bilingual speakers, who as they switch between their multiple languages, may import structures across languages (Thomason and Kaufman 1988; Thomason 2001). Given how

widespread multilingualism is across the world, "Contact may in fact be the most powerful catalyst of all in the process of the development of new linguistic variants in the speech community" (Hinton 1991: 154–55).

A prominent mechanism proposed to explain innovations introduced via borrowing is that of "interlingual identification", the process by which bilingual speakers equate units across languages, due to a high degree of perceived similarity and thus borrow structures across their different languages (Weinreich 1953). This may occur in morphological borrowing where, "one structure will more readily replace another if they already match rather closely in function" (Thomason and Kaufman 1988: 54), and also phonological borrowing, where phonetic transfer may come about when features from a speaker's L1 (first language) or primary language are carried over into their L2 (second language), often without their conscious control (Thomason 2001).[1] More precisely, phonetic transfer, "arises when a bilingual identifies a phoneme of the secondary system with one in the primary system, and in reproducing it, subjects it to the phonetic rules of the primary language" (Weinreich 1953: 14).

Experimental studies from the field of second language acquisition provide insight into how pervasive phonetic transfer is amongst bilinguals. While most research has focused on L1 influence on an L2, effects of L2 phonetic transfer on an L1 are also found, with effects identifiable after a relatively short period of exposure to a second language (Chang 2010). More specifically, researchers have proposed models of the way in which two sound systems in contact may mutually influence one another. Much of the work in this vein comes from two

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[1] I use the term "phonetic transfer" here and elsewhere in this dissertation instead of "interference" in order to avoid the negative association that Diné bizaad "interferes" with English, and therefore children should only learn English.

models: The Speech Learning Model (SLM) (Flege 1995) and the Perceptual Assimilation Model (PAM) (Best 1994). Central to both models is the idea that interlingual similarity will play a role in the production and perception of bilingual speech. These models are relevant to the present discussion because in cases of widespread bilingualism, variation introduced via phonetic transfer can result in community-wide phonetic or phonological change.

Very broadly, the PAM predicts that speakers will perceive L2 sounds based on L1 categories; if segments are perceived as different, a given contrast will be maintained, if not, the contrast will be perceived less easily, and acoustic similarities may lead to confusion (Best 1994). For instance, in an experiment with French, Hebrew, and English speakers, Hallé and Best (2007), tested how well speakers of each language could distinguish between /tl/ ~ /kl/ and /dl/ ~ /gl/. In French and English, only velar lateral sequences are permitted, while Hebrew permits both. The results reveal how the phonotactics of a speaker's native language influence and even distort perceptions of non-native input: French and English speakers categorized /tl/ as /kl/ and /dl/ as /gl/, allowable clusters in their respective languages. The acoustic and perceptual similarity between /tl/ and /kl/, and /dl/ and /gl/, facilitates the interlingual identification and impedes the accuracy of their perception. By contrast, Hebrew speakers more accurately distinguished between the /dl/-/gl/ and /tl/-/kl/ pairs.

Likewise, the SLM predicts that L1 and L2 phonetic systems will interact through category assimilation and dissimilation based largely on the concept of equivalence, whereby sounds in an L2 that are identical or similar to those in an L1 will not lead to the formation of new phonetic categories (Flege 2002). This may result in more heavily accented L2 speech, as speakers pronounce L2 sounds with phonetic characteristics of their L1. Though categorization may happen very quickly, the SLM predicts that learning can adjust throughout a lifetime and that increased experience with a second language will lead to changes over time

(Flege 1995). These predictions align with the experiences many people have when learning to speak a second language. Significant time, effort, and exposure to the sounds of the second language are typically needed for learners to more closely approximate native-like pronunciation. The SLM has been applied to describe phonetic transfer in bilingual contexts such as a study of Polish-American immigrants, who were found to voice their alveolar English stops like Polish; their L1 phonetic categories affect the realization of the similar L2 sound (Newlin-Łukowicz 2014).

While phonetic transfer is pervasive in the speech of bilinguals, the social dynamics of a bilingual community will have a significant impact on how variants are more broadly adopted. The length of bilingualism, age of the bilingual speakers, attitudes towards languages in contact, and patterns of language transmission all may significantly influence what is borrowed (Thomason and Kaufman 1988). Lexical borrowing is pervasive across a variety of language contact scenarios, but with more intensive and long-lasting bilingualism, any type of structural borrowing can occur (Thomason and Kaufman 1988). Over time, patterns of bilingualism and borrowing can result in stable bilingualism or even community-wide language shift, defined as, "the change from the habitual use of one language to that of another" (Weinreich 1953: 68).

A methodological question posed in the literature on language contact is how to establish that a particular change has come about due to contact as opposed to internal motivations with different criteria proposed for identifying contact-induced changes. Poplack and Levey (2010) advise against claims of contact-induced change without empirical evidence. They set forth guidelines for determining if something is contact-induced: it must not be present in the pre-contact variety, or if it is, it must be conditioned by different factors, it must be found in the source variety, and the adopted feature must operate in a similar fashion

to the feature in the source variety (Poplack and Levey 2010: 398). They suggest that contact-induced change may be less common than the literature represents.

Other researchers argue that there are no rigid criteria for determining if a change is contact-induced. For instance, Thomason (2008: 47) states, "Contact is a source of linguistic change if it is less likely that a given change would have occurred outside a specific contact situation". In the same vein, Mithun (2010: 674–5) says, "An important strategy for detecting contact-induced grammatical change, particularly morphological change, is the comparison of structures in genetically related languages spoken in different geographical areas. Features shared by a language with its neighbors but not with its relatives outside the area are more likely to be a result of contact." Davidson (2015) argues that contact should be considered alongside other linguistic and social factors that condition change in a variationist paradigm: contact is one potential motivator for the actuation of change, but changes can be simultaneously motivated by internal factors. Similarly, multiple motivators for changes with both internal and external motivations have been discussed by other scholars (Campbell and Muntzel 1989; Dorian 1993). Regardless of the precise origin of change in these contexts, Chirkova et al. (2018) posit that contact-induced change in minority languages is socially stratified in a way that is similar to changes found in larger monolingual language communities.

In this dissertation, I adopt the approach that contact between multiple languages is a frequent source of variation and change which can be analyzed quantitatively using variationist methods. Due to the rapidly changing sociolinguistic landscape of the Diné-speaking speech community, changes that have an English counterpart and are significantly more frequent among younger speakers are very likely to be motivated by contact with English. As a further assessment of the likelihood of contact-induced change, I investigate

how changes pattern among different types of bilingual speakers, with the prediction being that speakers who use English more regularly or who have been overall more exposed to English, will be more likely to produce innovations and adopt contact-induced changes (Backus 2005).

Lastly, as mentioned above, in chapter 7 I qualitatively analyze participant attitudes towards English and Diné bizaad in order to provide a detailed synchronic perspective on community language practices. Much of the research on language contact describes completed changes without the inclusion of speakers' reactions towards these changes, even though there is evidence that language attitudes can directly influence the spread of change (L. Milroy 2003) and even the actuation of change (L. Milroy 2003; Blust 2005 and O'Shannessy 2011). A greater understanding of current Diné language ideologies is highly relevant for language maintenance and revitalization in terms of unpacking the motivations speakers have for their linguistic choices in different domains. This discussion aims to address the local repercussions of a language experiencing intense contact in order to contribute to, "how little we yet know about the ways in which linguistic choices in multilingual contexts reflect and construct social identities and, thereby, interact with language vitality" (Di Carlo and Good 2017: e257).

1.3.2.1. Variation and Change in Endangered Languages

Within the broader field of language contact, a dedicated body of research has focused on structural changes that take place in minority languages experiencing language shift (Dorian 1973; Schmidt 1985; Campbell and Muntzel 1989; Hill 1989; Ravindranath 2009; Mansfield 2014; Matsumoto 2015). While many studies have documented an increase in variation and frequency of change in endangered language speech communities, such changes tend to be highly variable depending on the sociocultural context and the structures of the languages in

contact (Cook 1989; Wolfram 2002; Bird 2008). Some speakers show an increase in idiosyncratic variation as a language is spoken less (Cook 1989), while in other cases, community-wide patterns in variation may be maintained with less social meaning (King 1989). Speakers may also ascribe new social meaning to variants in the face of pervasive changes (Schmidt 1985), such as interpreting them as markers of ethnic identity (Haynes 2010; Newlin-Łukowicz 2014).

From this work, a typology of predicted changes has emerged. Andersen (1982) famously put forth several predictions regarding phonological changes in languages undergoing shift. He proposes that bilingual speakers will make fewer phonological distinctions than more proficient speakers, except in cases where the same distinction is found in the dominant language, or a contrast carries a high functional load. Weinreich (1953) details a similar typology of predicted phonic transfer in bilingual speakers across situations of language contact. He describes common outcomes of contact-induced phonological transfer that include the under-differentiation of phonemes leading to the merger of contrasts, the over-differentiation of phonemes resulting in the creation of additional contrasts, the re-interpretation of non-contrastive distinctions based on their importance in a primary language, and phoneme substitution. Babel (2009) proposes two additional predictions regarding sound change in endangered languages: phonologically similar segments are more likely to change via transfer, the categorical substitution of phonemes, while changes in timing are more likely to occur via approximation, or gradient phonetic merger, terms previously applied in the dialect contact literature (Trudgill and Foxcroft 1978).

Campbell and Muntzel (1989) address Andersen's predictions in a discussion of structural changes documented in language communities experiencing significant shift. They find evidence for Andersen's claims in several languages including Pipil, a Uto-Aztecan

language spoken in El Salvador. Speakers of Pipil have merged a phonemic vowel length contrast, and a distinction between affricate /ts/ and /s/, both contrasts not found in the dominant language, Spanish. Other phonological changes cited by Campbell and Muntzel include the overgeneralization or under-generalization of features, and an overall increase in variability and irregularity. Many of their documented changes are phonetically-motivated, though they find that some changes primarily driven by external motivations can lead to phonetically unnatural sound changes, such as when speakers of Pipil, substitute /ʃ/ with a trilled /r/ due to the stigma of /ʃ/ in Spanish.

Like in the literature on phonetic transfer in bilinguals, interlingual similarity is often invoked in explanations of established sound changes in endangered languages. Similarity is thought to drive segmental changes that occur via phonemic transfer (Babel 2009), and a lack of similarity is believed to lead in a minority language to the loss of phonological contrasts that are not shared by the socially dominant language (Andersen 1982). Despite its assumed relevance in such changes, the role of phonological similarity as a driver of the actuation of change has not been empirically established, and many questions arise in the literature on language contact (Babel 2009), and work on second language acquisition (Bohn 2002), regarding how similar segments need to be in order to show effects of phonetic transfer or be vulnerable to change. As an additional complication, researchers vary significantly in how they discuss phonological similarity (Chang 2015). Thus, in addition to weighing the role of language contact in ongoing changes, chapters 4 and 5 will present analyses of two sets of Diné bizaad sounds with phonologically similar counterparts in English in order to assess whether the sounds will consistently converge with English, and whether phonological contrasts that are shared across the languages are in fact preserved.

1.3.3. Documenting Variation in Minority Languages

Variationist sociolinguistic studies based on minority languages remain relatively rare, yet given that these communities often have fundamentally different social structures from the large, ethnically diverse, socio-economically stratified urban centers where most sociolinguistic research has taken place, extant studies have offered important insights about socially meaningful patterns of variation and change (Foley 1980; Romero 2006; Clarke 2009; Rau et al. 2009; Ravindranath 2009; Stanford and Preston 2009; Dorian 2010; Mansfield 2014). These studies provide an opportunity to test some of the assumptions that emerge from research conducted in the variationist tradition by applying similar methods to under-described sociolinguistic contexts with bilingual speakers, different social organizations, and typological diversity in linguistic structure. For instance, while many previous studies on larger language communities have found that variation correlates with macro-variables such as gender, ethnicity, socioeconomic class, and social network (Labov 1994, 2001; Trudgill 1972), it remains unclear how robustly variation patterns with these same or different categories in the smaller communities where minority or Indigenous languages are spoken. Existing studies have shown that socioeconomic class has proven less explanatory in studies of Indigenous languages (Stanford and Preston 2009), but gender remains a significant factor with women frequently leading change in some documented cases (Romero 2006; Ravindranath 2009; Clarke 2009; Rau et al. 2009). However, the role of gender is not always clear, and much more data are needed to confirm and understand this finding (Stanford and Preston 2009), as well as to think more critically about why local gender dynamics would account for these patterns.

As is also true in studies of larger languages, a careful consideration of the locally-relevant variables and social dynamics is essential to understanding the implications for patterns of variation and change in a given speech community (Eckert 2008). Studies on minority languages have identified local variables such as clan (Stanford 2009), township (Romero 2006), and territorial hunting group (Clarke 2009), as significantly conditioning observed variation. Future studies of this nature will continue to uncover additional variables as the field expands in typological breadth.

Given that many minority languages are increasingly in contact with larger global languages, age as a sociolinguistic variable is often closely tied to exposure to a dominant language. Therefore, in cases of variation that correlates with age, language contact effects must be considered alongside other explanations for linguistic innovation and change. Some recent studies have analyzed contact-induced sound changes using archival data compared with contemporary forms (Yu 2008; Babel 2009; Chang 2009; Harlow et al. 2009), while others have applied the apparent-time construct in analyses (Foley 1980; Romero 2006; Ravindranath 2009). A significant finding of these studies is that variation continues to be structured despite an increase in the frequency and rate of changes due to encroaching language shift.

Variationist studies on minority languages have also expanded notions of prestige that have played a central role in mainstream sociolinguistic theories. A greater awareness of the relative prestige of languages and varieties in these communities is important for understanding how changes spread, and for explaining why speakers use different varieties in particular interactions. Many sociolinguistic studies assume the existence of a standard language ideology whereby speakers accord a high-level of overt prestige to the variety associated with an educated, wealthy, or elite class. Some changes are said to occur when

community norms shift to more closely resemble prestigious variants (Labov 2001). At the same time, "covert prestige" plays a role in the diffusion of changes as non-standard variants may be viewed as markers of group solidarity or identity (Labov 1966; Trudgill 1972). This conception of prestige has been successful at explaining changes happening in many languages; however, it is not evident from work on smaller Indigenous languages that all speech communities have such a pervasive standard language ideology (Stanford and Preston 2009). For example, Foley (1980) found that Cherokee speakers did not evaluate any variety as more correct or prestigious, and Ravindranath (2009) argues that in the case of language shift in Belize, the usefulness of the language is more influential than perceived prestige. For other endangered languages, there is sometimes a high relative prestige associated with what is perceived as an older, more authentic form of the language (Holton 2009).

While minority language communities have garnered less attention from variationist sociolinguists, such languages have been the focus of significant language documentation projects with the goal being: "to provide a comprehensive record of the linguistic practices characteristic of a given speech community" (Himmelmann 1998: 166). From a language documentation perspective, the ongoing recording and analysis of language-internal variation is critical to accurately representing authentic language usage in different social and linguistic contexts (Childs et al. 2014). In ideal circumstances, a rich documentary record of a language would span different genres of speech, as well as data representing a variety of participants. In this project, I benefit from the substantial documentary record available for Diné bizaad and supplement it with contemporary data comprising speech produced by speakers of varying ages and sociolinguistic backgrounds.

1.4. Diné Background

In this section I briefly review the historical and social background relevant to understanding aspects of the contemporary Diné bizaad-speaking region and people. This section is not meant to be exhaustive or to purport to represent the experiences of all Diné speakers; the Diné people have long been a heterogenous group with significant internal diversity (Weisiger 2009).[2] This characterization also reflects my lens as a non-Native researcher, a position which I will discuss more explicitly in chapter 3.

1.4.1. Historical and Regional Overview

Diné bizaad is spoken by over 100,000 speakers predominantly in and around the Navajo Nation, a 25,000-square mile region that includes parts of Arizona, New Mexico and Utah (Census 2010). In addition to the main reservation, there are three non-contiguous regions of the Navajo Nation: Ramah, Alamo, and Tóhajileeh (Cañoncito). The traditional homeland, known to Diné people as *Diné bikéyah*, is geographically bounded in each cardinal direction by four sacred mountains. The sacred mountains play a central role in the Diné way of life, philosophy, and educational practices (Reichard 1950; Zolbrod 1988). Today the Navajo Nation is a sovereign nation governed by a president and agencies primarily located in the capital city of Window Rock, *Tségháhoodzání*, Arizona. The reservation is divided into five agencies comprised of 110 local chapters. Of the 332,129 Diné people identified by the 2010 US census, 47% or 156,823, live on the reservation (Census 2010). Figure 1 shows a map of the contemporary Navajo Nation region.

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[2] See Bailey and Bailey 1999, Iverson 2002, and Weisiger 2009 for detailed accounts of Diné history.
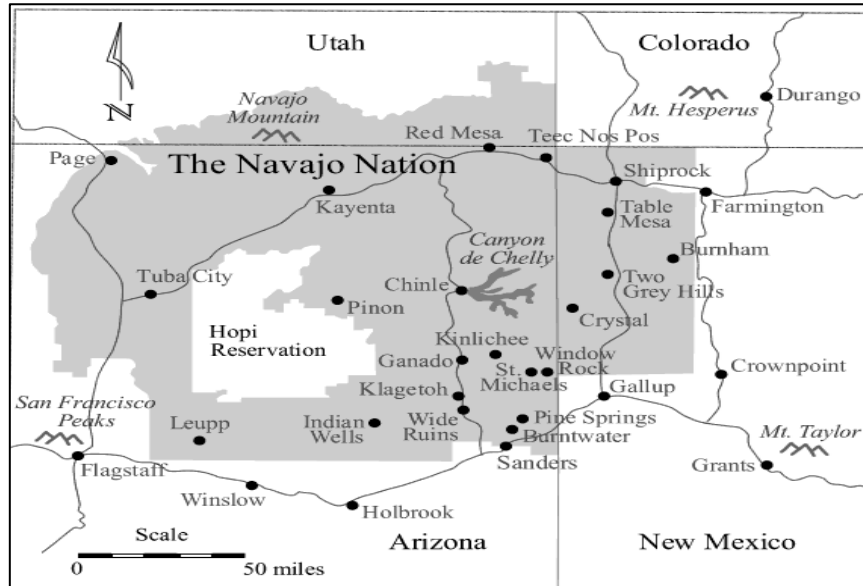
Figure 1. Map of the Navajo Nation and Surrounding Area (adapted from Hedlund 2004).

The Navajo Nation reservation was established by a treaty signed in 1868 between Diné leaders and the American government. This treaty allowed Diné people to return to their homeland after a brutal American campaign and four-year imprisonment in which around 8,500 Diné people, of a total population of around 10,000, were marched several hundred miles to Fort Sumner, New Mexico. Many did not survive the journey, and those that did were imprisoned from 1864–1868, withstanding horrible conditions including disease, starvation, and slave raids (Bailey and Bailey 1999; Iverson 2002). This forced march and ensuing imprisonment is known as The Long Walk, or *Hwéeldi,* and remains, for many people, important to contemporary Diné identity (Denetdale 2007; Lee 2013). Later executive orders expanded the Navajo Nation until 1933 when it reached its present size (Iverson 2002).

Historically, Diné people have settled in a dispersed manner rather than in concentrated centers, with a preference for local autonomy (Iverson 2002). Many Diné people, especially those who raise sheep, have long been highly mobile, with consistent seasonal

migrations in the summer and winter (Weisiger 2009; Jacobsen 2017). In the 1920s and 1930s, in response to what was perceived to be overgrazing of the land, the government initiated a disastrous policy of Livestock Reduction whereby Diné people were forced to give up designated percentages of their valuable herds. This policy had devastating effects, since at the time most people heavily relied on their livestock for economic survival, and the result was a fundamental reorganization of Diné economic and social structure (Henderson 2000; Weisiger 2009). Whereas previously Diné people moved seasonally with their flocks, without their sheep, people were less mobile, as they began farming or working in local towns or cities.

Throughout the twentieth century, settlement patterns on and off the reservation underwent significant changes. After Livestock Reduction, some Diné farmers continued to raise sheep, goats, and cattle, and produce the famously intricate Diné rugs (Bailey and Bailey 1999; Iverson 2002), while at the same time, population centers on the reservation grew alongside the rise of industries including forestry, tourism, railroads, and mining. As more men began working as paid laborers, reliance on livestock rapidly declined (Iverson 2002; Weisiger 2009). Furthermore, since the 1960s, many Diné people have lived and worked in nearby non-reservation towns (Bailey and Bailey 1999). These migrations resulted in a split whereby, "Navajos were becoming more tightly clustered in a few areas of the reservation, leaving more remote areas to older and less educated members of the family" (Bailey and Bailey 1999: 286).

The number of Diné people living outside of the Navajo Nation has increased significantly over the last fifty years. From the 1950s through the 1970s the government implemented a policy of urban relocation in a controversial effort to integrate Native Americans living on reservations into larger cities. During this time, many Diné people moved to Los Angeles, Chicago, Oakland and Phoenix, and today 26% of the Diné population lives

in metropolitan centers, with the largest number in Phoenix and Albuquerque (Census 2010). Outside of the urban relocation programs, growth has also continued to occur in the towns and cities bordering the Navajo Nation, known colloquially as "border towns". Today 10% of the Diné population live in border towns (Census 2010).

1.4.2. Contact with Neighboring Languages

Over the past few centuries, there has been extended contact between Diné and Puebloan speakers of Zuni, Hopi, Tewa, Tiwa, Towa, and Keres languages (Bereznak 1996). As is visible from the map in figure 2, Diné speakers are surrounded by speakers of Puebloan languages to the south, west, and east, and Southern Ute (not pictured) to the north.
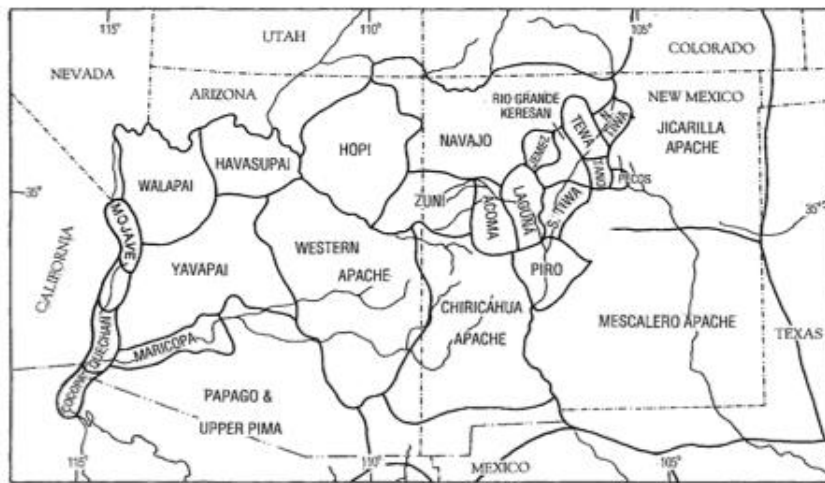
Figure 2. Languages of the Southwest (Campbell 2000: 359)

Historically, trade, intermarriage, and military alliances resulted in extensive bilingualism and cultural borrowing between Apachean, including Diné, and various Puebloan groups (Kroeber 1939; Kroskrity 1982; Bereznak 1996; Iverson 2002), but notably, "despite widespread cultural borrowing across that same span of time, the number of loan words that

23

has entered the Navajo language, historically has been very small" (Young and Morgan 1987: 7). This lack of lexical diffusion is characteristic of the Southwest, as speakers resisted lexical borrowing as part of maintaining their distinct sociolinguistic identities, while some degree of less salient grammatical transfer nevertheless took place (Kroskrity 1982). Some of the few Diné words borrowed from Spanish and English include *béeso* 'money' from *péso* and *mandagíiya* 'butter' from *mantequilla* (Young and Morgan 1987: 7). From English, Diné speakers adopted *Waashindoon* 'government' from *Washington* and *késhmish* 'Christmas' from *Christmas.*

1.4.3. Diné Social Structure

Diné social structure revolves around the clan kinship system and is governed by *k'é.* Very broadly, *k'é* is a system of reciprocity and communal responsibility that may be characterized as, "affective action and solidarity, encompassing such concepts as love, compassion, kindness, friendliness, generosity, and peacefulness" (Witherspoon 1977: 84). Within the kinship system, there are around sixty clans (Young and Morgan 1987; Iverson 2002; Jacobsen 2017).[3] Diné individuals inherit their mother's clan, while they remain connected to their father's clan and their maternal and paternal grandfathers' clans. Clan exogamy extends to all four clans (Morgan 1979). Prior to contact with the Europeans, Diné people lived in close contact with their Indigenous neighbors in the Southwest (Bereznak 1996), and the high degree of contact between the groups is evident by the incorporation of Puebloan and Utian peoples into the formal Diné clan system (Young and Morgan 1987; Iverson 2002). Though

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[3] A complete list of the sixty clans can be found in Young and Morgan 1987: 351–352.

clan is not analyzed as a social factor in this dissertation, sociolinguistic studies have demonstrated its relevance to linguistic variation in other languages (Stanford 2009).

Previous research describes linguistic variation that patterns geographically with a Western/Eastern dialect boundary aligning with the Chuska Mountains on the border between New Mexico and Arizona (Reichard 1945, 1951; Saville-Troike and McCreedy 1980). This linguistic variation also aligns with regional variation in oral traditions (Weisiger 2009), rug weaving designs (James 2004), and differences in economic histories (Weisiger 2009). The degree of regional diversity has reportedly decreased over the years as the region has become increasingly connected and affected by similar economic developments (Henderson 2000). Based on earlier reports of regional patterns in variation, as well as a high level of ideological perception of regional dialects, in the forthcoming analyses, I include region as a potential external factor in the observed variation. Attitudes towards regional variation are discussed in chapter 7.

Gender plays a distinct role in Diné society, most importantly the fact that the Diné clan system is matrilineal with matrilocal marriage practices. Women have historically owned property and livestock and have had substantial economic freedom in Diné society (Lee 2004; Weisiger 2009).[4] In terms of linguistic history, based on historical accounts of the Diné people throughout the twentieth century, women have been in direct contact with English speakers for a shorter period of time than men because men have typically held the role of communicating with government officials and were more likely to take wage jobs off the reservation (Weisiger 2009; Lee 2013).[5] In contemporary Diné society, many women, as well

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[4] See Denetdale 2001 for a discussion of Diné women and their representation in the anthropological record.
[5] Women did communicate directly with non-Diné people, especially traders, with whom they have long been in contact in order to barter rugs for food or other goods (Weisiger 2009).

as men, work in off-reservation jobs, and more Diné women than men attend college (Lee 2013). Language teachers are also more likely to be women, a trend reflected in this pool of speakers (Austin-Garrison et al. 1996). In the following analyses, I consider the role of gender as a social predictor of variation.

Due to the many sociolinguistic changes taking place in the Diné-speaking community, age is hypothesized to be an especially important social variable with regards to variation and change. While Diné bizaad retains a large and active speaker population of middle-aged and older speakers, like many of the world's Indigenous and minority languages, it is threatened by intergenerational shift to English (Lee and McLaughlin 2001; House 2002; Spolsky 2002; Benally and Viri 2005). Language proficiency is thus highly correlated with age; older speakers are more likely to be bilingual, while the younger generation is increasingly monolingual in English (Field 1998, 2009; House 2002; Lee 2007). More specifically, speakers older than 65 tend to be bilingual with Diné bizaad dominance, speakers 40–55 tend to be bilingual, and speakers under 40 often understand, but do not speak much Diné bizaad (Jacobsen 2017: 19). Among younger speakers, codeswitching is common, and a distinct "Bilingual Navajo" variety, a combination of English and Diné bizaad, has developed (Schaengold 2004). Furthermore, Diné people are a fairly young population: 53% of the total population are younger than 30 years old (Census 2010). In terms of social status, Elders— those older than 70 by some accounts (Lee 2013)—are an esteemed group within the Diné community. Based on this social context, both age and language background of different bilinguals are considered as social factors in the following chapters.

1.4.4. Diné Bizaad-English Bilingualism

Though the number of Diné speakers is higher than the number of speakers of most Indigenous North American communities, few children are growing up speaking the Diné language. Since World War II, English usage has rapidly increased, and bilingualism is widespread. In addition to the lack of intergenerational transmission, in the past few decades contact with the English-speaking world has increased dramatically with the rise of cellular and internet connectivity. Data from 1970 revealed that around 90% of Diné children entering preschool at that time had no knowledge of English, but in a sharp reversal, by 1990 most preschool children had no knowledge of Diné bizaad (Spolsky 2002).

There are many factors that contribute to language shift, but compulsory English-education policies have been particularly detrimental for North American languages by disrupting patterns of intergenerational transmission.[6] In the Diné-speaking community, policies that dictated that children must attend school have been efficient: in 1930 only 32% of Diné children attended school, while by 1958 that percentage had increased to 89% (Bailey and Bailey 1999; Henderson 2000). Initially many children were sent away to distant boarding schools in places such as Carlisle, Pennsylvania and the Sherman Indian school in Riverside, California, but eventually government schools were established on the reservation. Since the 1960s, most Diné children have been enrolled in day schools on or near the reservation (Henderson 2000). While all the participants in this study received at least some formal education, many were raised by parents or grandparents who did not.

In attempts to curb language shift, the Diné community has responded by implementing many language programs ranging from the pre-school to the college level.

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[6] See House 2002 for a thorough discussion of the dynamics of Diné bizaad language shift.

There are currently immersion, dual language, and foreign language programs that offer Diné bizaad throughout the Navajo Nation and neighboring border towns. Additionally, there are two Tribal Colleges, Diné College and Navajo Technical University, which offer advanced courses on the Diné language and culture. Outside of the Navajo Nation, the language is taught at several universities in the Southwest. Many of these programs have produced impressive all-around academic and social results for Diné students (Reyhner 1990; McCarty 2002). Contemporary domains of language usage and attitudes towards English and Diné bizaad will be discussed more extensively in chapter 7.

1.5. Dissertation Outline

Given this theoretical and social background, the forthcoming chapters will focus on linguistic descriptions of three variables and an analysis of language ideologies among this group of Diné bizaad-English bilinguals. Before presenting the results, chapter 2 provides an overview of the linguistic structure of the Diné language and chapter 3 a description of the documentary methods. In chapter 4, I present a phonetic analysis of variation in the release of the voiceless stops, in chapter 5 an analysis of variation in the onset place of articulation in the lateral affricates, and in chapter 6 an analysis of the variable usage of the particle *nít'ę́ę́'*. Chapter 7 is a qualitative analysis of language usage and contemporary attitudes based on discussions in English. Finally, chapter 8 concludes with the implications of this work.

Chapter 2

An Overview of Diné Linguistics

Diné bizaad, typically referred to in the academic literature as Navajo, is one of the most documented languages indigenous to America, and numerous books and dissertations cover various topics in history, linguistics, and anthropology.[7] In particular much linguistic research has focused on the Diné verb due to its intricacies and some typologically unusual features.

Early notable documentation of Diné bizaad includes a grammar by Haile (1926), work on phonology, morphology, and textual narratives by Sapir and Hoijer (1942, 1967), and a grammar by Reichard (1951). Most remarkable is the grammar and dictionary by Young and Morgan first published in its entirety in 1980 with a revised edition appearing in 1987. The opus comprises 437 pages of grammatical description combined with 1069 pages of bilingual dictionary entries. This massive undertaking was then followed up with an extensive analytical stem lexicon in Young, Morgan, and Midgette 1992.

Other research includes, but is not limited to, work in phonology (Kari 1976; McDonough 1990), phonetics (McDonough 2003a), language learning (Goosen 1995; Wilson 1995; Faltz 1998), philosophy (Witherspoon 1977), sociolinguistics (Schaengold 2004), socialization and acquisition (Field 1998; Chee 2007), syntax (Landar 1963; Perkins 1974, 1978; Schauber 1975; Platero 1978; Willie 1991), semantics (Fernald 2000), discourse

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[7] Due to the significant amount of research focusing on Diné bizaad, I will not provide an exhaustive list of work on the language. See Mithun 1999 and Williams 2009 for more thorough overviews of previous research.

(McCreedy 1983; Mithun 2008; Kiser 2014), and morphology (Smith 1996; Young 2000). These studies provide essential groundwork for the present analysis of synchronic variation. This chapter will provide an overview of pertinent topics in Diné linguistics with a focus on the genetic classification (§2.1), the phonology (§2.2), and the morphosyntax (§2.3). This brief introduction to Diné grammar will be supplemented accordingly in subsequent chapters.

2.1. Genetic Classification

Diné bizaad is part of the Southern Dene branch (Powell 1891) of the larger Na-Dene family (Sapir 1915; Krauss 1964, 1979; Hoijer 1971; Cook 1981). The list in figure 3 outlines the genetic classification of Diné bizaad, with a focus on the Southern branch.

Na-Dene
  I.   Tlingit
  II. Eyak-Dene
       A. Eyak
       B. Dene
             i.   Northern Dene
             ii. Pacific Coast Dene
             iii. Southern Dene/Apachean
                   1. Western Apachean
                         a. Chiracahua Apache
                         b. Diné bizaad
                         c. Mescalero Apache
                         d. Western Apache: San Carlos, White River, Cibecue, Tonto
                   2. Eastern Apachean
                         a. Jicarilla
                         b. Lipan
                         c. Plains Apache

Figure 3. Na-Dene Languages (Adapted from Campbell 2000: 111; Mithun 2001: 346)

2.2. Diné Bizaad Phonology

Diné bizaad has four vowels: /i e o a/ with phonemic nasality, tone, and length (Young and Morgan 1987; McDonough 2003a), as well as diphthongs /ei ai oi/ (Young and Morgan 1987: xii). Diné bizaad has one tone target, high or low, per syllable, and two possible tone contours, restricted to long vowels, include rising and falling tones (Young and Morgan 1987; McDonough 1999; Zhang 2002). The default low tone, unmarked in the Diné orthography, is much more frequent than the high tone, marked with an acute accent (McDonough 1999). Though tone is lexically contrastive, there are few minimal pairs, and tonal contrasts are restricted to particular morphological domains (McDonough 1999). Examples (1) and (2) show a minimal pair with contrasting tone on the long vowel.

(1)   'azéé' 'mouth, throat, neck, death'

(2)   'azee' 'medicine, drug, herb'

(Young and Morgan 1987: 143)

The Diné consonant inventory includes 32 phonemes, and closely resembles those of other Dene languages (McDonough 2003a). More details about specific consonants will be presented in the context of the analyses in chapters 4 and 5. Specifically, chapter 4 reports an analysis of the voiceless coronal and velar obstruents /t tʰ k kʰ/, and the voiceless velar fricative /x/. Chapter 5 includes an analysis of the ejective laterally-released obstruents /t͡ɬ t͡ɬ'/. Table 1 presents the Diné bizaad consonant inventory adapted from Iskarous et al. 2012: 197.

Table 1. Diné bizaad consonants in IPA

		Labial	Coronal		Lateral	Palatal	Velar		Glottal
Obstruents	unaspirated	p	t	ts	tl	tʃ	k	gʷ	ʔ
	aspirated		tʰ	tsʰ	tɬʰ	tʃʰ	kʰ	kʰʷ	
	ejective		t'	ts'	tɬ'	tʃʼ	k'		
Fricatives	voiceless		s		ɬ	ʃ	x		h
	voiced		z			ʒ	ɣ		
Approximants		w			l	j			
Nasals		m	n						

The Diné orthography, as it appears in the Young and Morgan grammar and dictionary (1980, 1987), was first developed in the 1940s in response to a request for standardization by the Office of Indian Affairs (Williams 2009). The orthography is widely used by Navajo language teachers and students, though overall Diné bizaad literacy has never been very pervasive; most Diné speakers read and write in English, but not in Diné bizaad (Spolsky and Irvine 1982; McLaughlin 1989; Jacobsen 2017). More recently, Diné bizaad keyboards have been developed for typing and texting in the language. The majority of the examples in this dissertation will be written in the Diné orthography. Table 2 presents the consonant inventory in the Diné orthography (adapted from Young and Morgan 1987: xiii).

Table 2. Diné consonants in Diné orthography

		Labial	Coronal		Lateral	Palatal	Velar		Glottal
Obstruents	unaspirated	b	d	dz	dl	j	g	gw	'
	aspirated		t	ts	tł	ch	k	kw	
	ejective		t'	ts'	tł'	ch'	k'		
Fricatives	voiceless		s		ł	sh	x		h
	voiced		z			zh	gh		
Approximants		w			l	y			
Nasals		m	n						

2.3. Diné Morphosyntax

Diné bizaad is a polysynthetic language with individual verbs often constituting entire clauses. Lexical classes include nouns, pronouns, particles, enclitics, postpositions, and verbs (Young and Morgan 1987).[8]

2.3.1. Nouns and Pronouns

Diné nouns include monosyllabic stems, possessed nouns, compound nouns, and various types of derived nominalizations (Young and Morgan 1987). Nouns may be inflected with a possessive prefix, which tends to be obligatory for body parts and kinship terms (Reichard 1951). Most nouns are not inflected for plural number, but some kinship terms take a plural suffix *-ké,* while other nouns derived from verbs take the prefix *da-* (Young and Morgan 1987: 7). Plurality can also be expressed with or without the *-ké* suffix through the use of the distributive *-da-* verbal prefix, shown in examples (3) and (4) (Lorene Legah p.c.).

(3)   *Shádí **'ádaat'é.***
        shi–ádí   'á–da–t'é
        1SG.POSS–older.sister   THEMATIC–DISTRIBUTIVE–be.IPFV
        'They are my older sisters.'

(4)   *'At'ééké **nidaané.***
        'at'eed–ké   na–da–né
        girl–PL   THEMATIC–DISTRIBUTIVE–play.IPFV
        'The girls are playing.'

Full noun phrases and independent pronouns are rare in Diné narratives; several pronominal subject prefixes are available for speakers to simultaneously track multiple

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[8] Descriptions vary in what constitutes the major Diné lexical classes. Reichard (1951) includes nouns, verbs, adjectives, pronouns, and postpositions, while Sapir and Hoijer (1967) describe prefixes, stems, and enclitics.

participants within a story (McCreedy 1983). When used, independent personal pronouns tend to contribute a meaning of emphasis (Young and Morgan 1987).

2.3.2. Particles and Enclitics

Diné bizaad contains many productive particles and enclitics, which carry a high functional load, especially in conversation wherein speakers use them to express modality and affect, among other pragmatic meanings (Young and Morgan 1987, 2000; Willie 1996; Palakurthy 2017). The historical and contemporary functions of the particle *nít'ę́ę́'* will be thoroughly discussed and analyzed in chapter 6. Young and Morgan (1987) list several adverbial, locative, conjunctive, and interrogative particles, as well as relative, postpositional, temporal-modal, and adjectival enclitics. Example (5) shows the enclitic *=dę́ę́'* 'from' in a sample sentence.

(5) *Shighan**dę́ę́'** łid halchin.*
     shi–ghan=dę́ę́'   łid   ha–l–chin
     1SG.POSS–house=from   smoke   3s–CLF–smell.IPFV
     'There is the smell of smoke (coming) from my hogan.'

                                                              (Young and Morgan 1987: 17)

2.3.3. Postpositions

Postpositions in Diné bizaad function to mark locative, directional, or other adverbial relationships between parts of a clause. Postpositional stems typically attach to pronominal prefixes functioning as objects and sometimes directly to nouns (Young and Morgan 1987: 26). Examples (6) and (7) show the postpositional stem *-iih* 'into, entering' attached to the pronominal prefix *bi-* 'it' and the noun *tsé* 'rock'.

(6)   *Chidí **biih** yí'ą́.*
       chidí   b–iih   yí–'ą́
       car   it–into 1SG.PFV–SRO.PRV
       'I put the solid roundish object into the car.'

                                     (Young and Morgan 1987: 30)

(7)   *tsééh*
       tsé–iih
       rock–into
       'into the rock'

                                     (Young and Morgan 1987: 26)

Diné bizaad clauses are basically predicate-final, so the postpositions typically precede the verb, and the boundary between the postposition and the verb is not always distinct. Of the 77 postpositional stems, 40 only occur independently, 7 occur primarily independently, 17 occur only as bound elements, and 12 occur both as bound and independent elements (Young and Morgan 1987: 27). Some bound postpositions function synchronically as applicative prefixes (Mithun 2002). For instance, example (8) shows the postpositional stem *-k'i* 'on' functioning as an applicative prefix *bik'éé-* 'off him'.

(8)   *Bich'ah **bik'éé**yol.*
       bi–ch'ah   bi–k'i–yí–yol
       3.POSS–hat   it–off–3PFV–fly.PFV
       'His hat blew off of him.'

                                   (Young and Morgan 1987: 27)

2.3.4. Verbs

There has been abundant focus on the Diné bizaad and Dene verb, and models and research span many theories and approaches. The best-known diagram of the Diné verb is the template published in Young and Morgan's (1987) seminal grammar and dictionary, though other relevant works include, but are not limited to approaches from the perspective of phonology

(Hargus 1988; Kari 1989; McDonough 1999), semantics (Rice 2000) and historical linguistics (Givón 1999; Mithun 2011). The Young and Morgan template describes the linear surface structure of a verbal construction (Young and Morgan 1987; Rice 2000).

In the template, pictured in table 3, there are ten positions associated with different derivational and inflectional morphemes, grouped into what are referred to as disjunct and conjunct domains in the Dene literature, primarily due to phonological patterning (Young and Morgan 1987; McDonough 2003a). As shown below, the stem occurs in position X, while positions 0-IX reflect the relative ordering of the different verbal prefixes.

Table 3. Diné verb template (based on Young and Morgan 1987: 37–38)[9]

Disjunct	0	Object of Postposition
	I	Postposition, Adverbial-Thematic, Reflexive, Aspectual
	II	Iterative
	III	Distributive
Conjunct	IV	Direct Object
	V	Deictic Subject
	VI	Adverbial, Thematic
	VII	Modal, Aspectual Conjugation
	VIII	Subject
	IX	Classifier
	X	Stem

In the template model of the Diné verb, not all slots must be filled, but verbs must contain at least two syllables and usually occur clause-finally (Young and Morgan 1987).[10] Diné verbs vary in semantic specificity and morphological complexity, as seen in the

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[9] Young and Morgan further divide positions I and VI into Ia, Ib, Ic, and Id and likewise VIa, VIb, and VIc, due to the possibility of morphemes in sub-positions. For ease of presentation, I combine these into one position and the corresponding meanings.

[10] An exception to this is the frequent verb of reported speech: *ní* 3SG.say.IPFV

examples below: example (9) shows a verb with one prefix, while example (10) presents a verb with six.

(9)   *nicha*
        ni–cha
        you–cry.IPFV
        'You are crying.'

(10)   *bik'iideeshwoł*
        bi–k'i–yi–di–ee–sh–woł
        it–on–TRANSITIONAL–INCEPTIVE–PROG–1SG–fight.FUT
        'I will fight.'

                                                    (Young and Morgan 1987: 210)

In order to exemplify some verbs from contemporary, naturally-occurring discourse, examples (11) through (15) include verbs containing different verbal prefixes. The verbs come from the personal narrative portion of the interviews.

(11)   *Nít'ę́ę́' silaoyę́ę **ch'ídeedlo'**.*
        nít'ę́ę́' silao=yę́ę   ch'í–di–ee–dlo'
        then   policeman=aforementioned   out.horizontally–oral–3SG–laugh.PFV
        'The police officer just laughed.'
                                        (18106-35 Joan Cooley Interview 00:14:59.000)

(12)   *'Áádóó la' bits'éé' **k'íinígizh**.*
        'áádóó ła'   bits'éé'   k'í–ni–gizh
        then   a   umbilical.cord   in.two–PFV–cut.PFV
        'And then his umbilical cord was cut off.'

                                        (18106-10 Frank Lujan Interview 00:17:05.705)

(13)   *Tsé'naa **nida'diilkǫ́ǫ́ł** 'áádóó,*
        tsé'naa na–da–'–di–iid–ł–kǫ́ǫ́ł   'áádóó
        across around–DISTRIBUTIVE–something–INCEPTIVE–1PL–CLF–swim.FUT   then
        'We will swim across and then,'
                                        (18106-38 Johnny Harvey Interview 00:22:05.890)

(14) *Daane'é da **bee nidei'née** łeh nídę́ę́'.*
daane'é   da   b–ee   na–da–iid–né   łeh   nít'ę́ę́'
playthings   some   it–with THEMATIC–DISTR–1PL–play.IPFV   usually PAST
'We used to play with things.'

(18106-40 Leroy Morgan Interview 00:27:40.030)

(15) *Diné bizaadígíí **yínídahwiidooł'ááł.***
Diné   bizaad=ígíí   yíní–da–hwi–di–ooł–ááł
Navajo language=DEF   directed.at–DISTRIBUTIVE–space–INCEPTIVE–3PL–learn.FUT
'They will learn the Navajo Language again.'

(18106-29 Mary Whitehair Frazier Interview 00:23:30.260)

The verb stem is the final element in the verb word and carries the main semantic content. Phonotactic constraints on the prefixes render the stem phonetically prominent: only in the stem does the full consonant inventory appear, and the stem syllable is significantly longer than other morphemes in the verb (McDonough et al. 1993; McDonough 2003b). The stem is fundamental to a Diné verb, but the language, like many polysynthetic languages, has a relatively small inventory of verb stems (Dorais 2017). There are 550 Diné stems to which speakers may add 253 prefixes in 16 different positions and sub-positions (Kari 1989: 426). Semantically, stems express an abstract meaning, made specific by combinations of verbal prefixes (Young and Morgan 1987). Though synchronically unanalyzable, the stem represents a diachronically fused root and aspect marker (Mithun 2011).

All Diné verbs are inflected for what are termed in the literature as mode and aspect, with each mode requiring a particular set of pronominal subject prefixes. The seven modes include Imperfective, Perfective, Iterative, Usitative, Future, Progressive, and Optative, though not all verbs can be conjugated in every mode (Young and Morgan 1987). Though called mode in Dene descriptions, in more general linguistic terminology these are aspect (Imperfective, Perfective, Iterative, Usitative, and Progressive); tense (Future); and mood

38

(Optative) markers (Williams 2009). The examples listed in (16) display the stem alternations for one verb inflected for first person singular (Young and Morgan 1987: 781).

(16)   Stem alternations for 'drink'

Imperfective:	yishdlá̜	'I drink it'
Iterative:	náshdlį́į́h	'I regularly drink it'
Usitative	yishdlį́į́h	'I customarily drink it
Perfective:	yishdlá̜á̜'	'I drank it'
Future:	deeshdlį́į́ł	'I will drink it'
Optative:	wóshdlá̜á̜'	'Would that I drink'

Additional aspectual distinctions are derived through the use of a particular stem, an aspectual prefix, or a combination of the stem with aspectual prefixes in positions I, III or VI (Young and Morgan 1987). The eleven aspects crosscut the modes and include Momentaneous, Continuative, Durative, Conclusive, Repetitive, Semelfactive, Distributive, Diversative, Reversionary, Conative, Transitional, and Cursive (Young and Morgan 1987: 164). Ten further sub-aspects are defined by prefix combinations in position I, VI, or VII. These include: Inceptive, Inchoative, Stative, Semeliterative, Seriative, Completive, Terminative, Terminal, Prolongative, Revisionary (Young 2000). Together, these mode and aspect conjugations form the basis of the Diné verb paradigm (Young 2000; Williams 2009).

The Diné verb is often noted as being typologically unique in its interweaving of inflectional and derivational morphemes in the verbal positions (Rice 2000). The derivational prefixes may be found in positions 0, I, II, and VI, while the inflectional prefixes occur in III, IV, V, and VII. Another unusual facet of the Diné verb is its propensity for discontinuous morphology, also called "interrupted synthesis" by Sapir (Kari 1989; Rice 2000). In this way, verbal meaning in Diné bizaad is composite, with verb bases often consisting of discontinuous morphemes in the form of thematic prefixes in nonadjacent positions in the verbal template (Young and Morgan 1987; McDonough 2000). However, the complexity of verbal derivation

39

does not likely reflect how speakers synchronically form and use verbs. Evidence suggests that polysynthetic verbs may be learned as full constructions (Mithun 1989), and it can be difficult to define the meaning conveyed by individual morphemes; the presence of other prefixes or stems may effectively determine the meaning of prefixes in a given verb. In a preliminary experimental investigation, researchers have confirmed the intuition that meanings of individual prefixes are not always transparent to speakers (McDonough and Sussman 2006).

To illustrate how a single Diné speaker uses verbs with different prefixes, as well as the other parts of speech, in a slightly longer stretch of spontaneous discourse, example (17) presents the beginning of a story told by one of the participants in this study: Ernest Harry Begay from Rock Point, Arizona. In particular, the final three lines of this example show how Mr. Begay produces three verbs with slightly different meanings through his use of different combinations of prefixes with the same perfective verb stem *-ną'* 'crawl'.

(17)　　*'Akódzaa*
　　　　'a–hwí–dzaa
　　　　THEMATIC–3SG–do.PFV
　　　　'This is what happened.'

　　　　'Ałk'idą́ą́',
　　　　'ałk'idą́ą́'
　　　　'Long ago,'

　　　　Díkwíí shį́į́ shinááhaigo 'éí shį́į́ yá ni'.
　　　　díkwíí　　　　shį́į́　　　　　shi–nááhai=go　　　　　'éí　　　shį́į́　　　　yá ni'
　　　　how.many　　DUBIATIVE　　my–year=SUB　　　　　DEM　　DUBIATIVE　　PAST
　　　　'I don't recall how old I was back then.'

　　　　*Níléí nástł'ahdi 'áádi tsé bąąh **nidei'na'**.*
　　　　níléí　　nástł'ah=di　　'áádi　　tsé　　　b–ąąh　　ni–da–iid–d–na'
　　　　there　　corner=at　　　there　　rock　　it–on　　NI.PFV–DISTR–1PL–CLF–crawl.PFV
　　　　'Way in the corner there we climbed the rocks.'

　　　　*Níléí gódei tsé bikáá' **hasis'ną'**,*
　　　　níléí　　gódei　　tsé　　bi–káá'　　　　　ha–sis–d–na'
　　　　there　　up　　　rock　　it–on　　　　　　up–1SG.PFV–CLF–crawl.PFV
　　　　'Way up there I climbed on top of the rock,'

　　　　*nít'ę́ę́' **nidinish'ną'**.*
　　　　nít'ę́ę́'　　　　ni–dini–sh–d–na'
　　　　then　　　　　NI.PFV–PROLONGATIVE–1SG–CLF–crawl.PFV
　　　　'but then I got stuck.'
　　　　　　　　　　　　　　　(18106-18 Ernest Harry Begay Interview 00:11:44.605)

2.4. Summary

This chapter presented an overview of the phonological and grammatical structure of Diné

bizaad. More details will be provided for each examined variable in the following chapters,

but first in chapter 3, I present the documentation methods.

41

Chapter 3

Methods of Documentation

In this dissertation, I apply methods of variationist sociolinguistics and language documentation to analyze targeted variables in speech production and language attitudes. The following sections detail the selection of variables (§3.1), the interview process (§3.2), the transcription methods (§3.3), and the data management plan (§3.4).

3.1. Selection of Variables

Based on earlier studies that cite variation in Diné bizaad (Reichard 1945, 1951; Kari 1976; Saville-Troike and McCreedy 1980; Young and Morgan 1987; Holm 1996; McDonough 2003a; Chee et al. 2004; Field 2009), my own observations of the Diné language, as well as many conversations with native speakers, I identified several variables for in-depth investigation.[11] The targeted linguistic variables include the release of the voiceless aspirated stops: /tʰ/ /kʰ/, the place of articulation of the lateral affricates: /t͡ɬ/ ~ /kɬ/ and /t͡ɬʼ/ ~ /k͡ɬʼ/, and the discourse use of the particle *nít'ę́ę́'*.[12] These three variables were selected due to their high frequency in produced speech and their potential to inform issues of interest in linguistic theory and pedagogical application. I hypothesize that results will identify areas of socially-

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[11] I am very grateful to the members of the Navajo Language Academy for sharing their expertise and insights with me during the 2015–2018 annual summer workshops.

[12] I do not analyze lexical variation in this project, though in the appendix, I provide a list of variants that participants mentioned during their interviews. Lexical variation is very salient to several participants.

meaningful variation and ongoing changes where greater linguistic knowledge and description can be helpful to language teachers and learners.

The targeted social factors for this project include *age*, *gender*, *region*, and self-identified *language background*, and I actively recruited participants in an attempt at attaining a balanced distribution of speakers among these factors. I operationalized the factor *region* by asking participants about their linguistic background in a series of ethnographic questions. If participants reported that they grew up primarily in New Mexico, they were classified as Eastern speakers; speakers from Arizona were classified as Western. *Gender* was determined by what I perceived to be the overt gender presentation, and *age* was recorded as year of birth and also divided into three groups representing twenty-year generations: young speakers were 18–38 at the time of the recordings, middle-aged speakers were 39–58, and older speakers were 59–78.

Lastly, I based the *language background* classification on self-reported first language and current language usage. Heritage language speakers are those who grew up hearing and speaking Diné bizaad, but now primarily use English. Simultaneous bilinguals are those who have spoken both languages since birth. L1 Diné bizaad sequential bilinguals grew up with Diné bizaad as a first language and learned English later, while L1 English sequential bilinguals first acquired English and later Diné bizaad. Table 4 displays the distribution of the participants by the targeted social factors. Tables 5 and 6 show the distribution of the participants organized by gender and region respectively.

Table 4. Background of Participants

Factor	Levels	Number of Participants
Region	Western (Arizona)	29
	Eastern (New Mexico)	22
Gender	Men	20
	Women	31
Age	Younger speakers (18–38)	14
	Middle-aged speakers (39–58)	22
	Older speakers (59–78)	15
Language background	Heritage language speakers	9
	L1 English bilinguals	2
	L1 Diné bizaad bilinguals	36
	Simultaneous bilinguals	4

Table 5. Background of Participants by Gender

Factor	Levels	Number of Women	Number of Men
Region	Western (Arizona)	20	9
	Eastern (New Mexico)	11	11
Age	Younger speakers (18–38)	8	6
	Middle-aged speakers (39–58)	14	8
	Older speakers (59–78)	9	6
Language background	Heritage language speakers	6	3
	L1 English bilinguals	1	1
	L1 Diné bizaad bilinguals	22	14
	Simultaneous bilinguals	3	1

Table 6. Background of Participants by Region

Factor	Levels	Number of Eastern Speakers	Number of Western Speakers
Gender	Men	11	9
	Women	11	20
Age	Younger speakers (18–38)	4	10
	Middle-aged speakers (39–58)	10	12
	Older speakers (59–78)	8	7
Language background	Heritage language speakers	3	6
	L1 English bilinguals	1	1
	L1 Diné bizaad bilinguals	15	21
	Simultaneous bilinguals	2	2

Due to my personal background as a former teacher in the area and my involvement in workshops with language teachers and linguists, the number of teachers and participants with advanced degrees is highly represented in this study. As a result, the participants in this study may be more educated, and interested in language, than the broader Diné-speaking population. I did not attempt to determine the socioeconomic status of participants, though information about education levels and occupation were shared by many participants over the course of the interviews.

Given the range of sociolinguistic practices within the Diné community, I anticipated a wide range in language proficiency levels and did not attempt to evaluate participants' language abilities. When recruiting participants, I asked that they be able to comfortably recount a story in Diné bizaad, and most participants met that criterion. Though differences in language proficiency likely explain some observed variation, I found that focusing on *language background* was more explanatory than attempting to post-hoc operationalize for language proficiency. In line with goals articulated by Vallejos (2016) and others, I believe that even less-proficient speakers should be well represented in the documentary record in

order to better understand how language is used by speakers with different sociolinguistic backgrounds.

3.2. Interviews

In order to amass sufficient representative speech from a diversity of speakers, I conducted and audio-recorded interviews with fifty-one self-identified bilingual Diné bizaad-English participants. I first conducted nine interviews in Fall 2016 during a small-scale pilot study, a well-established practice in the field of sociolinguistics (Feagin 2013). I then adjusted and extended those preliminary interviews to include additional participants, who more accurately represented the diverse linguistic and social background of the Diné bizaad-speaking community. The interviews lasted 45–60 minutes and were conducted in towns and cities bordering the Navajo Nation including Gallup, New Mexico; Farmington, New Mexico; Flagstaff, Arizona; Cortez, Colorado; Blanding, Utah; and Albuquerque, New Mexico. Interviews typically took place in public places such as libraries, offices, or coffee shops. The geographic distribution of the participants is shown in figure 4. This map is of the Navajo Nation region in the Southwest with each pin representing the hometown of one of the participants.
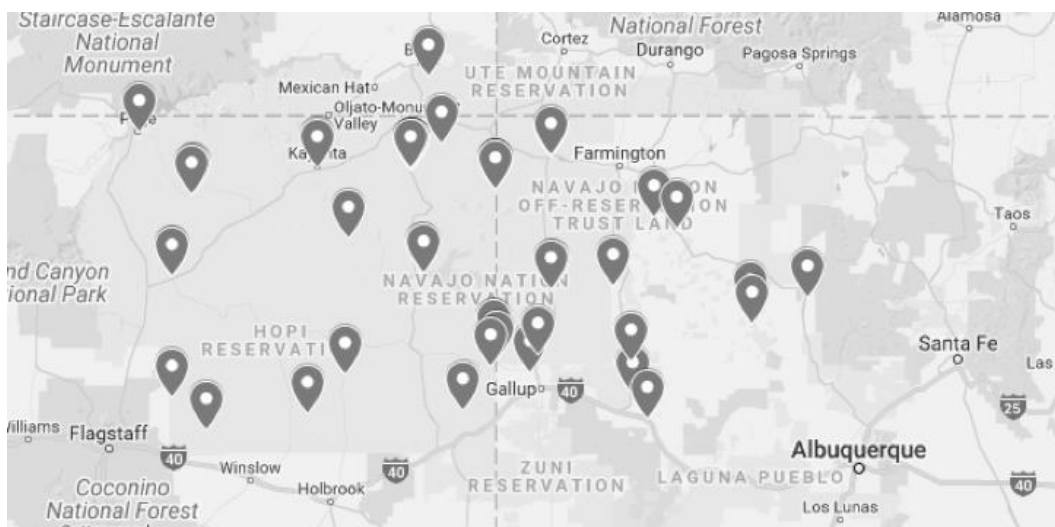
Figure 4. Distribution of Participants by Hometown

3.2.1. Researcher Positionality

My positionality as a non-Diné, non-Native linguist conducting and recording the interviews certainly influenced the results of this study. Given the intrusions of the recording equipment, and the fact that I provided payment to each participant, there was a level of formality and power imbalance in the interviewer-interviewee setting that likely resulted in less casual and more monitored speech than would arise in natural conversation between Diné-speaking interlocutors. Furthermore, as a non-Diné researcher, my positionality and ideologies shaped the questions I asked, the answers I received, and the perspective I take in organizing, analyzing and interpreting these data. However, these limitations do not necessarily impede the ability to obtain meaningful results, as has been demonstrated by other carefully designed studies conducted by outsider interviewers (cf. Hill and Hill 1986; Drager 2015). Though the focus here is on empirical analysis, my perspective on these data is likewise informed by my ethnographic observations first as a middle school teacher in a Navajo Nation town, and later a linguist and researcher.

Given the troubling legacy of research in Native communities, questions of ethics and transparency were constantly considered and revisited throughout the research and analysis process. With regards to these topics, this project benefited from discussions from 2015–2018 with language activists and teachers especially at the Navajo Language Academy. Before beginning the project, I also received a letter of support from the Navajo Nation Historic Preservation Department. Given that all interviews were conducted off the reservation, no permit was required. When contacting participants, I attempted to be very transparent about the goals, outputs, and potential benefits of this study for me as the researcher, as well as to the Diné community. This information was explicitly outlined on a written consent form—available in the appendix—that was also presented orally to each participant before the interview began. All participants consented to the interview, though some chose to keep their data anonymous or not to archive their recorded materials. I have continued to contact all participants with periodic updates on the project, summaries of the results, and copies of their transcribed and translated personal narratives.

3.2.2. Recruitment

I utilized multiple strategies in recruiting participants for this project. First, I reached out to Diné speakers who I knew personally and asked if they, or someone they knew, was interested in participating. Next, I used publicly available contact information to reach out to the many Navajo language teachers throughout the region. Third, several of my Diné friends and colleagues generously connected me with additional participants who they thought would like to participate. Beyond these recruitment strategies, I also pursued what has been referred to as the "snowball sampling technique" (Milroy and Gordon 2008): after every interview, I asked participants if they knew anyone else who might be interested in participating. This

strategy proved very fruitful in scheduling future interviews. The use of this methodology meant that I knew some of the participants beforehand, but many were new acquaintances. Participants were compensated for their time with cash payment and were offered either a CD or a MP3 file of their interview.

3.2.3. Interview Recordings

The interview consisted of five parts and was recorded using a Tascam DR-100 MK II digital audio recorder at a sampling rate of 44.1 Hz and a depth of 24 bits. Participants wore a Shure SM35-XLR head-worn microphone to ensure high-quality phonetic data, and I held a Røde omnidirectional interview microphone. First, the participants were asked a series of demographic questions, which they answered in English. Then, participants were asked to read a list of sixteen words in English. This provided a basis of comparison for an analysis of sibilant harmony which is not included in this dissertation. Then participants were asked to provide the Diné bizaad equivalent of around eighty-two English words or phrases collected through the use of an oral translation task. The words were repeated twice by each participant. The words were chosen to target phonetic and phonological features for structured comparison across speakers. In many cases the elicited words were the same or very similar to those listed in McDonough 2003a in order to facilitate real-time comparison with earlier phonetic data. The words were verified by Lorene Legah, a native speaker and longtime language instructor, prior to beginning the interviews. The tokens from each speaker vary because participants did not always know the targeted word and at times provided an alternative. A list of the elicited words is presented in the appendix.

Next, participants were shown a six-minute silent movie called *The Pear Film,* which was created for use in elicitation of discourse across languages (Chafe 1980). After watching

the film on a laptop computer, participants were asked to narrate what happened in Diné

bizaad. The film strategically includes different kinds of action in order to elicit a variety of

constructions related to referent tracking, topic marking, verbs of motion, simultaneous and

sequential action, clause linking, prosodic phrasing, and information structure, among others.

The use of this methodology allows for comparison between speakers to identify individual

and dialectal variation, and also for cross-linguistic comparison with the many narratives that

have already been collected. Towards the end of the interview, when participants were more

comfortable with the format, participants were asked to recount a short narrative in Diné

bizaad about a non-sensitive topic of their choosing. Most participants recounted a childhood

event or family memory. In one case, two participants, a married couple, told a story together.

Lastly, participants answered a series of questions in English about their observations of

language variation and contemporary usage. Table 7 includes the total number of minutes in

the recorded corpus of connected speech, as well as the means per speaker.

Table 7. Summary of Connected Speech in the Interview Corpus

	Pear Film Narratives	Personal Narratives
Total	2 h, 36 min.	3 h, 6 min.
Mean	3 min.	3.5 min.

3.3. Transcription

Upon completion of the interviews, I transcribed the English sections of the recordings with

the help of two undergraduate research assistants at the University of California, Santa

Barbara: Steven Castro and Mikaela Moore. I segmented the elicited words for acoustic

analysis using Praat textgrids, and ethnographic meta-data were entered into a spreadsheet

with social factors coded for each participant. The Diné bizaad connected speech data were

primarily transcribed and translated by Kendralyn Begay. Ms. Begay was recruited based on her interest in the project and her prior experience transcribing Diné language data. I trained Ms. Begay on using the Elan software, and over the course of around six months she transcribed and translated most of the Diné connected speech data. Dr. Ellavina Perkins, a native speaker and linguist, also contributed one Pear Film transcript.

3.4. Data Management

Data comprising digital audio files in an uncompressed .wav format, time-aligned transcription Elan .eaf files, and plain text files of the transcribed and translated interviews, have been archived at the Alaska Native Language Archive in Fairbanks, Alaska. Materials will be available indefinitely with digital open access for researchers, community members, and language teachers. The archived collection is titled "Variation in Diné bizaad". In the forthcoming examples, citations will refer to these archived data by the archive identifier number for that resource and the cited time within the interview recording.

3.5. Summary

This chapter provided an overview of the documentary methods. Because of the range of investigated variables, a more detailed description of particular methods for each analyzed variable will be included in the forthcoming chapters.

Chapter 4

Variation and Change in the Aspirated Stops

4.1. Introduction

The first variable under investigation is the aspiration of the voiceless stops, /t^h/ and /k^h/, known cross-linguistically for their exceptionally long release periods measured in voice-onset time (Cho and Ladefoged 1999) and the strength of their aspirated releases, as evidenced by statements such as: "The most striking properties (of Navajo) are the strength of the frication; this includes the aspiration period of aspirated stops" (McDonough 2003a: 5). These distinct characteristics have led some researchers to analyze the stops as complex affricates /tx/ and /kx/ (McDonough 2003a; McDonough and Wood 2008), though other descriptions cite differences between the sounds, suggesting that only /tx/ is truly an affricate (Young and Morgan 1987). Additionally, scholars have long noted inter-speaker variation in the aspirated releases, whereby stronger or weaker aspiration is reported to be salient and socially meaningful to Diné speakers as a marker of region (Reichard 1945, 1951; Saville-Troike and McCreedy 1980).

Given this background, this chapter describes a sociophonetic study of the variable release of the voiceless stops, /tʰ/ and /kʰ/, measured acoustically with voice-onset time (VOT) and center of gravity (CoG), or spectral mean, to compare the frication in the releases. Through quantitative analysis, this chapter:

i.   provides synchronic phonetic documentation of the Diné voiceless stops,

ii.   analyzes how social and linguistic factors condition variation in the length and spectral characteristics of the release periods,

iii. evaluates results from statistical models for evidence of changes-in-progress motivated by internal and external factors.

These sounds were selected for analysis because based on earlier descriptions, they are hypothesized to carry social meaning. Additionally, given the frequency of VOT as a site of contact-induced phonetic change (see §4.3) and the phonological similarity between Diné bizaad and English aspirated stops, it is hypothesized that the exceptionally long release periods of /tʰ/ and /kʰ/ will be shorter than earlier measurements and perhaps be undergoing changes in spectral frication due to contact with English. Because English makes a similar phonological distinction in VOT between (voiced) unaspirated stops and voiceless aspirated stops, a second prediction, in line with Andersen (1982), is that Diné speakers will maintain the phonological contrast in VOT between aspirated and unaspirated stops. Younger speakers and those who use more English, are predicted to show more evidence of contact-induced changes.

4.2. Variation in Diné Stops

The Diné phoneme inventory includes labial, alveolar, and velar stops with a three-way laryngeal distinction for the alveolar and velar stops between voiceless unaspirated, voiceless aspirated, and voiceless aspirated ejectives (McDonough 2003a).[13] An earlier phonetic study based on data from 7 speakers reports a mean VOT value of 154ms for aspirated /k^h/ and 130ms for aspirated /t^h/ (McDonough and Ladefoged 1993). Furthermore, some researchers analyze the stops as affricates /tx/ and /kx/ due to the timing of segmental gestures, with release periods that are phonetically similar to the plain velar fricative /x/ (McDonough and Wood 2008).

Diné language resources reflect this variation in descriptions of /k^h/ and /t^h/. As mentioned, in their presentation of the consonant inventory, Young and Morgan list Diné <t> as /tx/: "a strongly aspirated phoneme produced by placing the tip of the tongue in a t-position, followed by raising the back portion of the tongue to a point of near contact with the velar area to thus produce the spirant described under syllable-initial h" (Young and Morgan 1987: xv).[14] In contrast, they describe /k/ as an "aspirated back palatal stop comparable to the k of English *kill*" (Young and Morgan 1987: xiv). Young and Morgan describe palatal allophones of /t^h/ and /x/ before front vowels and of /k^h/ before /e/. The sounds /k^h/, /t^h/, and /x/ are realized with labialized allophones before /o/ (Young and Morgan 1987: xv).

Other language resources provide variable descriptions of /k^h/ and /t^h/. Goosen (1995) describes the pronunciation of /t/ "with a slight /x/ sound /tx/" versus /k/ "with a slight /h/

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[13] In the Diné orthography, the unaspirated stops are written as <b d g> even though they are phonetically voiceless. The voiceless aspirated stops are written <t k> and voiceless ejectives <t' k'>.

[14] Young and Morgan describe the pronunciation of syllable-initial <h> as, "The air, forced through the narrowed passage, produces a "hissing sound" comparable to that represented by the <u>ch</u> of German ich" (Young and Morgan 1987: xiv).

sound /kh/" (Goosen 1995: xiii). However, the textbook *Dine' bizaad bo'hoo'aah* describes stronger aspiration with /k/ than /t/: "(k) is similar to English k but is more strongly aspirated" (Navajo Language Institute 1986: 43), and "(t) is similar to English t in tin" (Navajo Language Institute 1986: 45). Other sources do not distinguish between the aspiration in /k^h/ and /t^h/, but still point out the affrication or aspiration to English-speaking readers. Williams (2009) describes the pronunciation of /k^h/ and /t^h/ in words like *bikáá'* 'on it' and *táá'* 'three' as having "raspiness pronounced near the back of the throat" (Williams 2009: 44). In his introductory book focusing on Navajo verbs, Faltz states that /k/ is pronounced, "like "k" in English, but with heavier breathing" (Faltz 1998: 4). He provides a similar description for /t/.

In addition to differences between /k^h/ and /t^h/, the supralaryngeal constriction of the aspirated stops is said to vary across speakers: "consonants are aspirated, by some speakers very weakly, by others so strongly as to form consonant clusters—tx, kx" (Reichard 1951: 19). Diné speakers are reportedly aware of the variation: "Navaho who do not emphasize the breathiness refer to those who do as x-speakers and mimic them by articulating the affected sounds almost as if they were coughed" (Reichard 1945: 160). In other descriptions, stronger aspiration has been associated with Diné speakers from the Western region in Arizona, who are described as sounding "harsher than in New Mexico" on account of the force of their aspiration (Saville-Troike and McCreedy 1980: 33). Other studies report that some speakers spirantize k > x (Reichard 1948; Kari 1976).

Strong aspiration has even been the focus of comedic imitation in performances of the Diné comedian, Vincent Craig, known for his portrayal of an exaggerated Navajo accent (Jacobsen 2017). In a clip of one of his performances from 1994, he introduces his song *Rita* this way:

"Please remember this song is sung with an accent okay, so it's not really me singing. Because I went to college. You know you get anybody else you know like non-Indians, they always come up and say, "Mr. Craig, would y'all sing that song Rita?" And I said "No, no, no it's not Rita, it's Rithaaa." I said. "You got to add that little last push that's the way we say it, Rithaaa."
(retrieved from https://www.youtube.com/watch?v=8YxeJ8HD-FU)

This quote illustrates the degree to which aspiration is a noticeable feature of Navajo-accented English. At the same time, Craig contrasts this accent with that of someone with a college education, alluding to the ideological dichotomy between uneducated Diné speakers with heavy Navajo English accents and educated Diné people with a greater command of English.

4.3. Voice-onset Time

Aspiration in this analysis is acoustically measured first using voice-onset time (VOT). VOT is an important cross-linguistic cue for categorizing stops, and languages vary in the number and type of stop categories, typically divided into three ranges: negative or lead VOT with voicing that precedes the stop burst (-125ms to -75ms), short-lag or voicing that begins soon after the burst (0 to 25ms), and long-lag delayed voicing and aspiration after the stop burst (60 to 100ms) (Lisker and Abramson 1964: 403). Table 8 displays the phonemic categories for velar stops including the category of highly aspirated stops, found only in Tlingit and Diné bizaad.

Table 8. Cross-linguistic VOT categories for velar stops (Cho and Ladefoged 1999: 223)

	Unaspirated	Slightly aspirated	Aspirated	Highly aspirated
VOT	30ms	50ms	90ms	>120ms

Previous research on variation in VOT has identified several linguistic and social factors that influence its realization (Flege 1991; Yao 2007; Nagy and Kochetov 2013).[15] The most important phonetic factor affecting VOT is place of articulation; cross-linguistically velar voiceless stops tend to have a longer VOT than alveolar or bilabial stops (Cho and Ladefoged 1999; Byrd 1993). Relevant exceptions include Tlingit (Maddieson et al. 2001), and Northern Dene Beaver (Schwiertz 2009), in which stops do not differ significantly based on place of articulation. Likewise, in Dahalo, a Cushitic language spoken in Kenya, alveolar stops are found to be much longer than dentals or velars (Maddieson et al. 1993). This unexpected result is explained with the statement: "It is likely that their relatively long friction and aspiration duration could serve as a significant cue distinguishing alveolar plosives from the others" (Maddieson et al. 1993: 29). Other linguistic factors that significantly influence VOT are prosody (Keating et al. 2003), following vowel (Klatt 1975), speech rate (Allen et al. 2003), morphology (Schwiertz 2009), and word frequency (Yao 2007). Variation in VOT has also been attributed to social factors such as gender (Swartz 1992; Whiteside et al. 1998; Koenig 2000; Whiteside et al. 2004; Robb and Lerman 2005; Oh 2011; Michnowicz and Carpenter 2013), age (Raphael et al. 1995; Koenig 2000; Whiteside et al. 2004), regional dialect (Scobbie 2006; Takada and Tomimori 2006; Michnowicz and Carpenter 2013; Stanford and Pan 2013), and language background (Nagy and Kochetov 2013). However, despite significant progress in identifying factors, especially social ones, that influence VOT, the amount of explained variance often remains quite low (Allen et al. 2003; Yao 2007; Schwiertz 2009); this suggests that there is still much to be understood about VOT and its variable realization.

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[15] See Yao 2007 for a very thorough overview of factors that affect VOT.

Studies of bilingual speech production frequently analyze VOT as a locus of phonetic transfer (Maclagan et al. 2009; Nagy and Kochetov 2013; Michnowicz and Carpenter 2013). Since many languages use VOT as a cue to different stop categories, studies often compare VOT values of phonologically similar segments in the speech of monolinguals and bilinguals who speak languages that utilize the cue of VOT differently (Flege 1991; Flege at al. 1996; Fowler et al. 2008; Lamy 2012; Nagy and Kochetov 2013; Michnowicz and Carpenter 2013). For instance, bilingual speakers of French and American English were found to produce /t/ in both French and English with a VOT of ~55ms, an intermediate value between the longer VOT found in English and the shorter VOT in French (Flege and Hillenbrand 1984). The authors of this study concluded that bilingual speakers had perceived French and English /t/ to be equivalent, and an intermediate value arose due to the development of a merged category influenced by both languages.

However, apparent segmental similarity does not always lead to a merged VOT target. A study of bilingual speakers of Dutch and English found that the more proficient speakers were in English, the shorter their VOT became for Dutch /t/. These data indicate that speakers established a distinct phonetic category for English /t/ and used VOT to dissimilate between English and Dutch categories (Flege and Eefting 1987). Levels of phonetic transfer in VOT may vary by the age at which speakers learn the second language (Flege 1991; Flege et al. 1996), the salience of VOT as an ethnic marker (Newlin-Łukowicz 2014), the relative order of language acquisition (Fowler et al. 2008), where they learn the second language (Sleeper 2015), and other factors related to attitude and identity (Flege et al. 1996). Together these studies show that VOT values in both a speaker's first and second languages may be influenced by the experience of speaking languages where VOT values align with different phonological categories.

In the case of Diné bizaad and English, the languages use VOT as a cue to distinguish between similar categories. Both English and Diné bizaad distinguish between unaspirated stops with a short-lag VOT and aspirated stops with a long-lag VOT, though the famously long Diné stops are beyond the typical range for long-lag aspiration (Cho and Ladefoged 1999). In particular, at the beginning of a stressed syllable, the English aspirated allophones [tʰ] and [kʰ] are similar to the pronunciation of Diné /tʰ kʰ/. Likewise, in initial position, the English voiced stops /d g/ have voiceless unaspirated allophones [t] and [k] which resemble the pronunciation of Diné /t k/. To facilitate inter-lingual comparison, table 9 displays mean VOT values of the alveolar and velar stops from earlier studies of Diné bizaad (McDonough and Ladefoged 1993) and English (Lisker and Abramson 1964). While English stops /p t k/ and /b d g/ also differ in voicing, the primary distinction, as shown in table 9, is aspiration (Lisker and Abramson 1964). The Diné measurements, recorded in Shiprock, New Mexico in 1992, come from five women and two men. The participants are described as, "educated native speakers of Navajo, who live on the reservation and use Navajo daily" (McDonough and Ladefoged 1993: 153). The ages of the speakers are not reported.

Table 9. Mean VOT in ms of Diné bizaad and English Alveolar and Velar Stops.

	Unaspirated	Aspirated	Ejective
Diné bizaad	/t/ 6	/tʰ/ 130	/t'/ 108
	/k/ 45	/kʰ/ 154	/k'/ 94
English	/d/ [t] 5	/t/ [tʰ] 70	
	/g/ [k] 21	/k/ [kʰ] 80	

These Diné bizaad VOT measurements were recorded twenty-five years ago, and an increase in English usage among Diné speakers has since ensued. Given this sociolinguistic context, some phonetic transfer is predicted in the speech of bilinguals. Based on the previous

studies reviewed in chapter 1 describing observed structural changes in endangered languages, Diné speakers are expected to retain contrasts shared with English, thus speakers here are hypothesized to maintain the VOT contrast between unaspirated and aspirated stops. Furthermore, if speakers equate Diné and English segments based on their similarity in place of articulation or phonemic category, subphonemic convergence towards English is expected, resulting in shortening of the release periods of /kʰ/ and /tʰ/.

4.4. Center of Gravity

The aspirated stops were also analyzed using center of gravity (CoG), a measurement of the average frequencies in a spectrum recorded in Hertz. CoG serves as an acoustic correlate to articulatory constriction whereby sounds with a more anterior articulation have more energy at higher frequencies and a higher CoG (Gordon et al. 2002). In Diné bizaad, previous CoG measurements of the velar fricative /x/ are reported to be similar to the velarized release of /kʰ/ and /tʰ/ (McDonough and Wood 2008: 400) with extensive co-articulation effects from the following vowel, especially in the case of /tʰ/ (McDonough 2003a). Analyses of CoG in other Dene languages show that the CoG of the release period of /kʰ/ differs significantly from /tʰ/; the release of /kʰ/ has a lower CoG in most of the examined languages (McDonough and Wood 2008).

The spectrograms below illustrate some of the variation present in the visible frication of the stop release periods. The spectrograms show a y-axis frequency range of 0–10,000Hz. The first two spectrograms display tokens of *tádiin* 'thirty' with */tʰ/*, spoken by Sylvia Jackson and Annie Walker respectively. Mrs. Jackson is a middle-aged woman from Arizona. Her release of /tʰ/ is 131ms with a CoG of 947Hz (18106-01 Sylvia Jackson Interview 00:19:04).

Mrs. Walker is an older woman from Arizona. Her release of /tʰ/ is 91ms with CoG of 5016Hz. (18106-16 Annie Walker Interview 00:14:21). Both release periods show frication throughout the release, but in figure 6, darker bands of energy are visible at higher frequencies. Mrs. Walker has a much higher CoG value in her release of /tʰ/, while Mrs. Jackson's release has a longer VOT.

The second set of spectrograms shows tokens of the word *ké* 'shoes' containing the sound /kʰ/, as spoken by Vincent Werito, and then Lemuel Harvey. Mr. Werito is a middle-aged man from New Mexico. His release of /kʰ/ is 135ms with a CoG of 4819Hz (18106-26 Vincent Werito 00:12:38). Mr. Harvey is a middle-aged man from Arizona. His release of /kʰ/ is 71ms with a CoG of 2495Hz (18106-13 Lemuel Harvey Interview 00:06:07). Again, both spectrograms show energy throughout the release, but Mr. Werito's release in figure 7, contains darker bands at higher frequencies, signaling a higher CoG. He also has a much longer VOT for /kʰ/ than Mr. Harvey in figure 8.
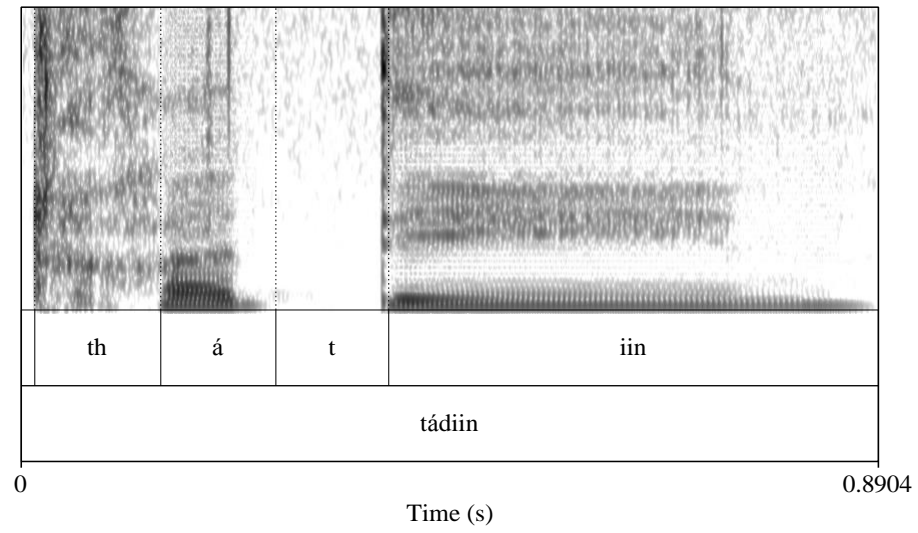
Figure 5. Token of *tádiin* [tʰatiːn] from Sylvia Jackson
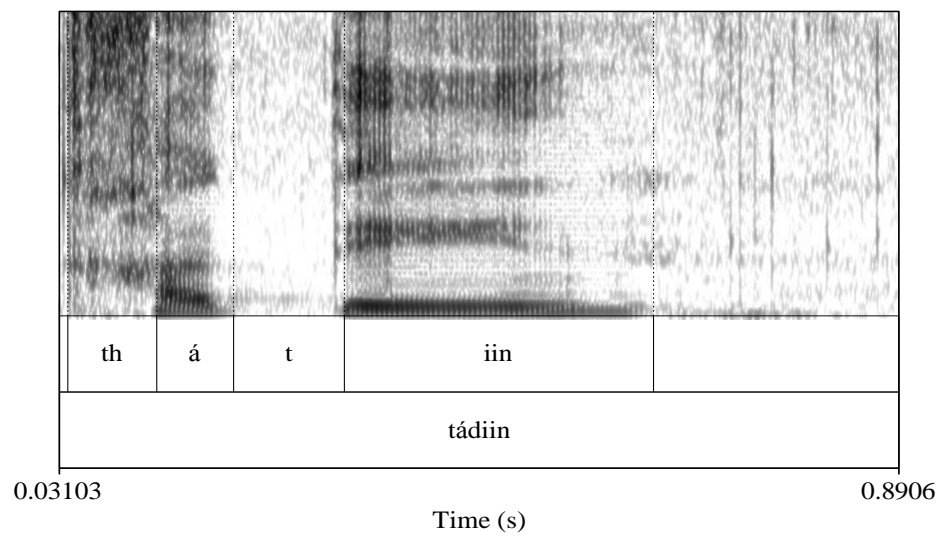
Figure 6. Token of *tádiin* [tʰatiːn] from Annie Walker
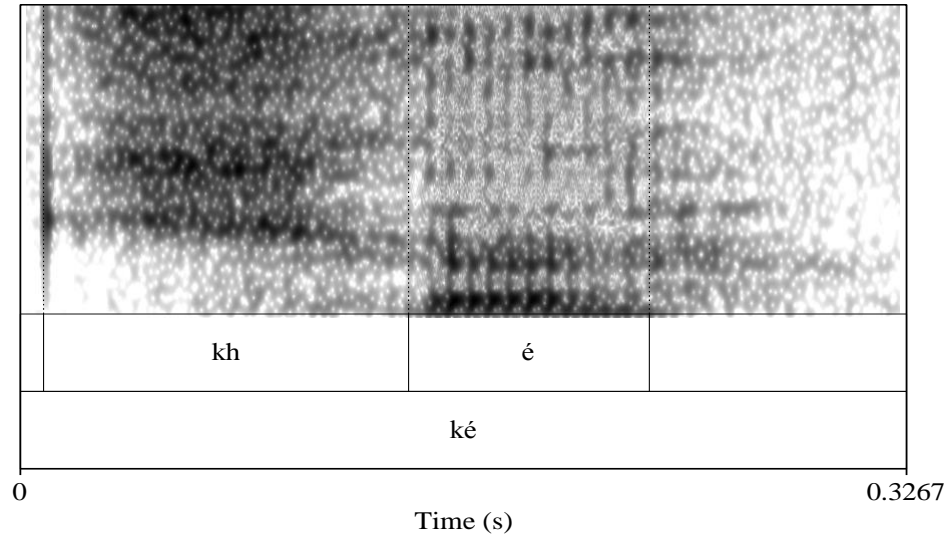
Figure 7. Token of *ké* [kʰɛ́] from Vincent Werito
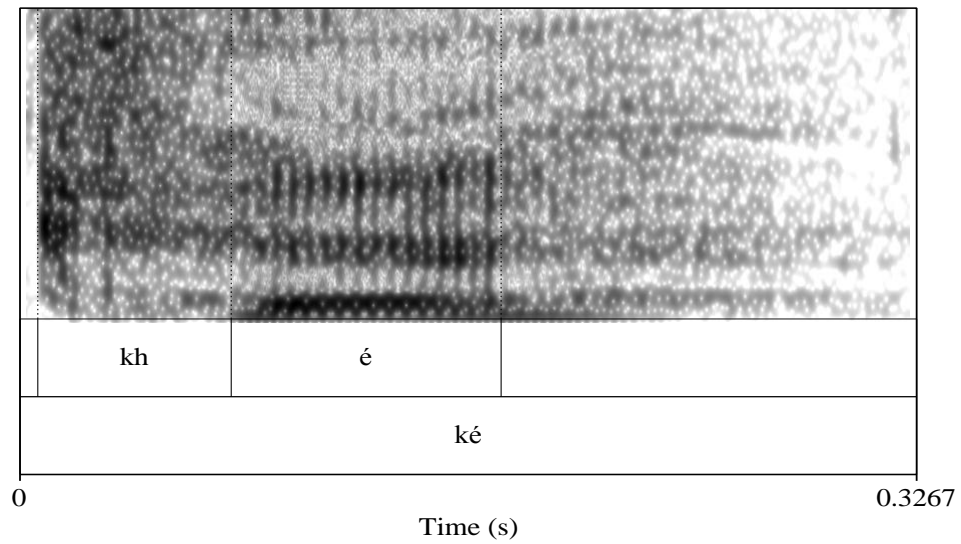
Figure 8. Token of *ké* [kʰɛ́] from Lemuel Harvey

4.5. Methodology

Following methods outlined in Cho and Ladefoged 1999 and McDonough 2003a, I used an

oral translation task to elicit tokens of targeted phonemes /kʰ/, /tʰ/, and /x/ in stem-initial

position, distributed before different vowels. Participants repeated each word twice. Wordlist prompts for /kʰ/, /tʰ/, and /x/ are listed in the appendix. Additional tokens were extracted from the pear film stories and personal narratives. In total, VOT measurements were recorded from 1125 tokens of /kʰ/ and 1775 tokens of /tʰ/. Of these, 623 occur in the connected speech data. In order to analyze the synchronic status of the phonological contrast between unaspirated and aspirated stops, 133 elicited tokens of the unaspirated stop /k/ and 181 tokens of unaspirated /t/ were also included. The measured tokens of the unaspirated stops were not restricted to stem-initial segments. Finally, a comparison of 513 VOT measurements of English aspirated [tʰ] and [kʰ] was conducted with the English connected speech portions of the same interviews.

The VOT of the unaspirated and aspirated stops was segmented and measured as, "the interval between the release of the articulatory stop closure and the onset of the voicing of the following vowel" (McDonough and Ladefoged 1993: 153). I first segmented the release periods using the visual waveform and wide-band spectrogram in Praat (Boersma and Weenink 2017), and then used automated scripts to compile the measurements.[16] In the case of multiple bursts, VOT was measured from the first burst, and 26 statistical outliers with a VOT greater than 200ms were removed. In order to facilitate comparison with earlier measurements taken of stem-initial segments (McDonough and Ladefoged 1993), and due to noted prosodically and morphologically-conditioned duration effects (McDonough 2003a), only stem-initial tokens of the aspirated stops were included in the analysis: these include nominal, verbal, and postpositional stems. The small number of tokens after nasals had much

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[16] I modified a version of a Praat script generously shared with me by Lal Zimman. His script in turn is based on one written by Will Styler and available at https://github.com/stylerw/styler_praat_scripts.

longer VOT values than tokens in other phonetic environments, so I excluded those 55 tokens from the analysis.[17]

CoG was measured with a power spectrum weighting of two using the release period as the window of measurement. Following Sundara 2005, a 200Hz high-pass filter was applied with a 100Hz smoother in order to remove effects of voicing, and a 12,000Hz low-pass filter to remove higher frequencies irrelevant for audible cueing (Thomas 2011). The CoG measurements come from 1086 tokens of Diné bizaad /kʰ/ and 1736 tokens of /tʰ/; 617 tokens come from connected speech. A total of 71 tokens were removed due to background noise.

After compiling the acoustic measurements, each observation was annotated for the linguistic and social predictors shown in table 10. These predictors and levels were then tested with linear mixed-effects models fit to values of VOT and CoG using the *lme4* package (Bates et al. 2015) in R (R Core Team 2017). Models included random intercepts for SPEAKER and WORD and the independent predictors as tested fixed effects. The maximal models for CoG and VOT are the same with the exception that the VOT model includes PHONETIC ENVIRONMENT. Post-hoc testing was conducted using the *multcomp* (Hothorn et al. 2008) and *lsmeans* packages with Bonferroni adjustments (Lenth 2016). In this analysis and that discussed in chapter 5, I used the R packages: *dplyr* (Wickham et al. 2018) and *ggplot2* (Wickham 2009) for data exploration and visualization.

Following Zuur et al. 2009, the fixed effects structure was determined by starting with a maximal model containing all main effects and interactions calculated with maximum likelihood estimation and applying a backwards selection process in which non-significant

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[17] This included only the second /tʰ/ in *tónteel* 'ocean'.

interactions and predictors were individually removed.[18] The final model was computed with

restricted maximum likelihood estimation.

Table 10. Distribution of Observations by Independent Predictors.

Independent Predictors	Levels	VOT n	CoG n
SEGMENT	k^h	1125	1086
	t^h	1775	1736
SOURCE	Wordlist	2277	2205
	Discourse	623	617
FOLLOWING VOWEL	a	779	771
	e	731	693
	i	685	664
	o	705	694
PHONETIC ENVIRONMENT	Word-initial	833	800
	V_V	1041	1021
	C_	1026	1001
AGE GROUP	Younger (18-38)	808	769
	Middle-aged (39-58)	1187	1157
	Older (59-78)	905	896
GENDER	Man	1123	1112
	Woman	1777	1710
REGION	East (New Mexico)	1271	1234
	West (Arizona)	1629	1588
LANGUAGE BACKGROUND	Heritage Language Speaker	401	379
	L1 both bilingual	202	194
	L1 English bilingual	135	127
	L1 Diné bizaad bilingual	2162	2122

4.6. Results

The presented results begin with updated phonetic documentation of the aspirated and

unaspirated stops followed by results from the models fit to VOT and CoG for the aspirated

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[18] LANGUAGE BACKGROUND was tested as an additive effect.

stops. Finally, CoG values for the aspirated stops will be compared to CoG of the velar fricative /x/.

4.6.1. Observed Results

As predicted, results show that the VOT contrast between Diné bizaad unaspirated and aspirated stops is robustly maintained in these data. Since previous measurements mainly targeted intervocalic segments, a comparison limited to this environment reveals that the VOT of intervocalic /k^h/ (mean=103; sd=31) is 51ms shorter than earlier measurements, while the VOT of /t^h/ (mean= 126ms; sd=25) is only 4ms shorter. For the unaspirated stops, the VOT of /k/ (mean=24ms; sd=9) is 21ms shorter, while the VOT of /t/ (mean=13ms; sd=5) is 7ms longer. Table 11 displays the means and standard deviations organized by phonetic environment compared with values from the earlier study. The observed data shown here include measurements of the sounds in elicited words; these same values are displayed in figure 9.[19]

Table 11. VOT by phonetic environment of aspirated stops in elicited words

	/k^h/	n	/t^h/	n
Word-initial	83 (26)	351	109 (23)	390
C_	90 (23)	279	110 (24)	293
V_V (2017)	103 (31)	235	126 (26)	575
V_V (1992)	154 (43)[20]	-	130 (29)	-

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[19] Two exceptionally long outliers with VOT>400ms are not shown in this figure.

[20] These data came from 119 words, mostly monosyllabic nouns, but some verbs (McDonough and Ladefoged 1992: 153).
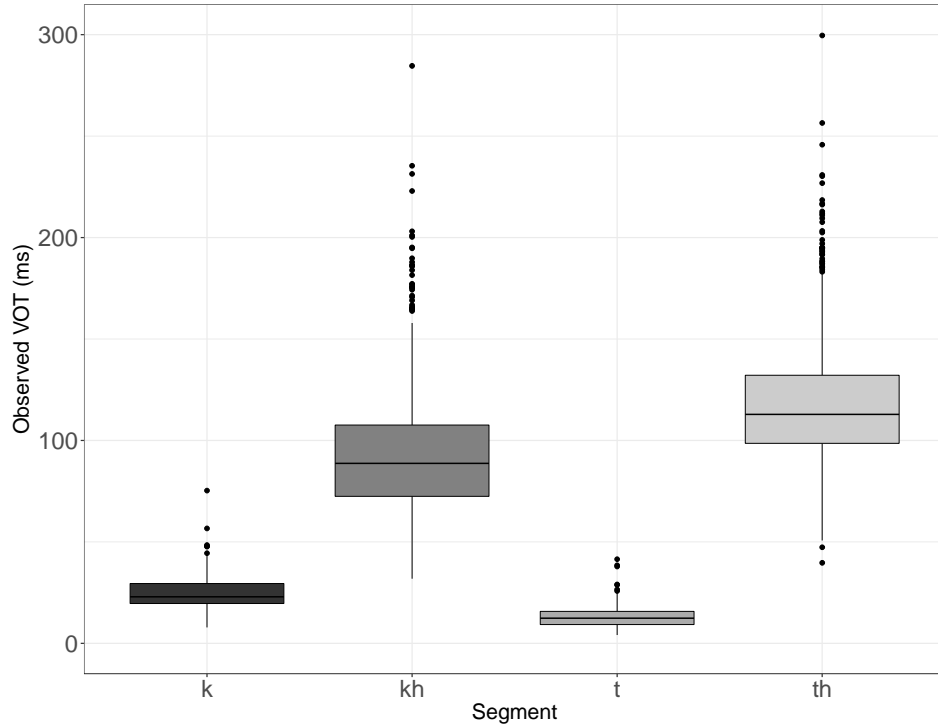
Figure 9. Observed VOT by Segment

There is a significant difference in VOT between alveolar and velar unaspirated stops (p<0.001*)* and aspirated stops (p<0.001).[21] Across all phonetic environments, participants produce longer VOT values for aspirated /tʰ/ (mean=117ms; sd=26) than /kʰ/ (mean=93ms; sd=28), a result that contradicts typological patterns and earlier results. As mentioned above, I conducted a comparison of the VOT of English aspirated [tʰ] and [kʰ] using discourse data from the same speakers (n=513); comparable English words were not elicited. Figure 10 displays the VOT of these English aspirated stops alongside the Diné bizaad aspirated stops.

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[21] In order to control for multiple repeated measures, statistical differences in the raw data here and elsewhere were calculated using *lme4* (Bates et al. 2015) and *afex* (Singmann et al. 2018) packages in R

Figure 10 shows that the VOT values for Diné /kʰ/ and English [kʰ] are more similar than the corresponding values for /tʰ/ and [tʰ]. These results will be discussed in more detail in §4.7.
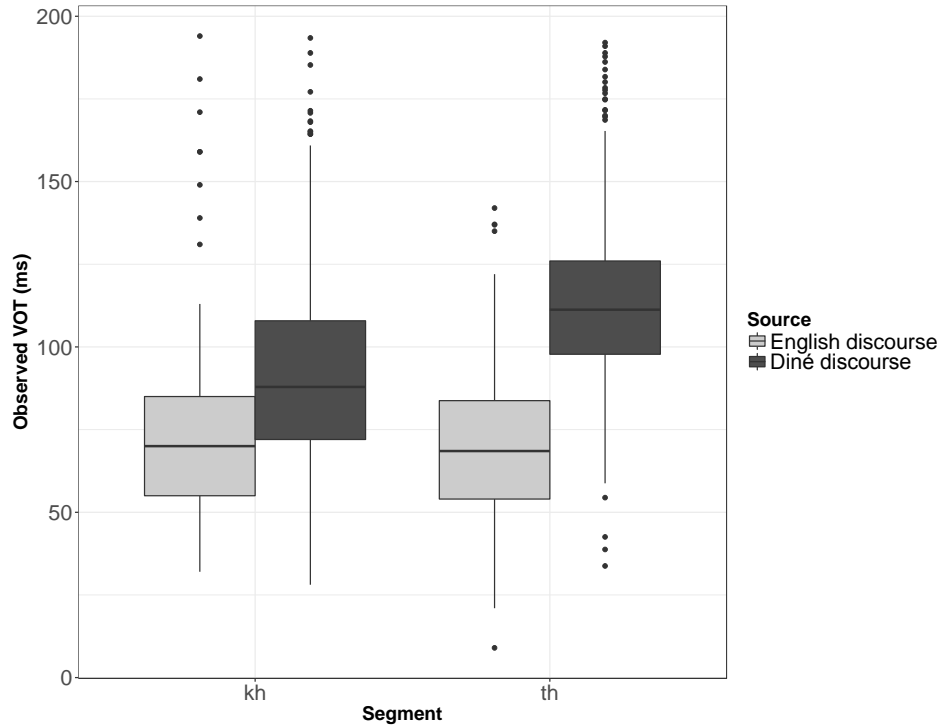
Figure 10. Observed Diné bizaad and English VOT by Segment

In these data the mean CoG value for /kʰ/ is 3401 (sd=1459) and for /tʰ/ is 3757 (sd=1679), a significant difference (p<0.001) with a higher CoG reflecting a more anterior place of articulation for /tʰ/. Figure 11 presents boxplots of the CoG values for Diné aspirated /kʰ/ and /tʰ/. The range of measurements for CoG is notably wider than that for VOT; much of this variation arises from co-articulation with the following vowel.
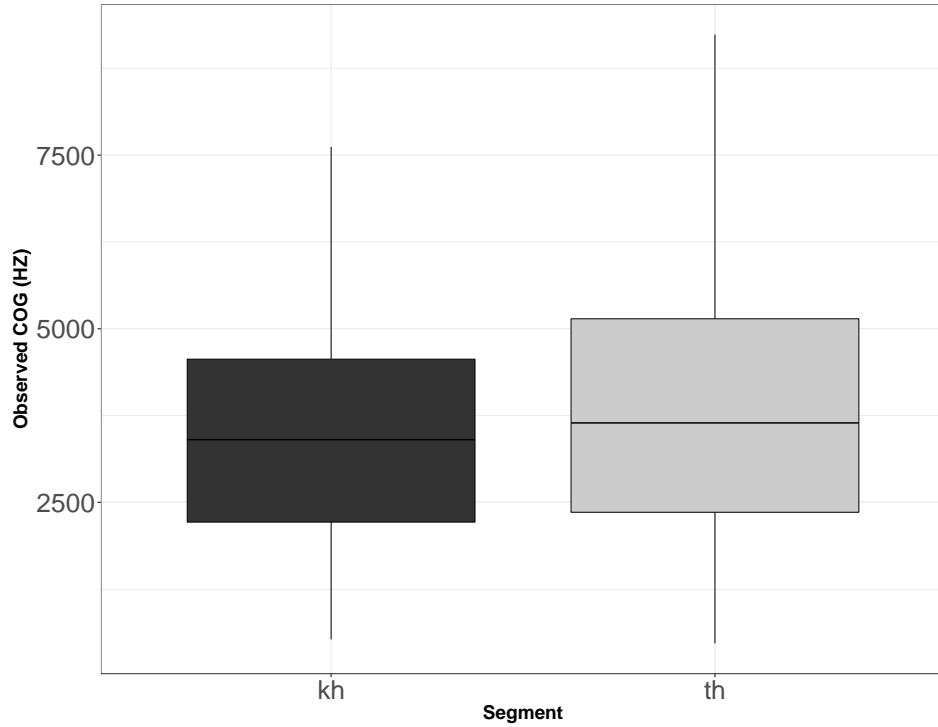
Figure 11. Observed CoG by Segment

4.6.2. VOT Statistical Results

In order to further analyze the linguistic and social factors conditioning VOT, a mixed-effects regression model was fit to VOT. The final model included seven significant interactions presented in table 12 *($R^2=25\%$; $cR^2=60\%$)*. Four interactions from the model will be discussed, while results of the three remaining interactions: AGE and FOLLOWING VOWEL, GENDER and FOLLOWING VOWEL, PHONETIC ENVIRONMENT and GENDER are presented in the model output with graphs available in the appendix along with the random effects output. Significant effects are bolded in table 12.

Table 12. Fixed effects coefficients for model fit to VOT values

		Estimate	t-value	n	Mean VOT
INTERCEPT	/kʰ/	109.90	17.99	1125	93
	C_			1026	105
	Following vowel			779	110
	/a/			1187	111
	Middle-aged			1123	111
	Men				
SEGMENT	/tʰ/	16.90	5.28	1775	117
AGE	Older	-11.38	-1.43	905	106
	Young	-18.82	-3.91	808	104
PHONETIC ENVIRONMENT	**Word-initial**	-13.51	-5.89	833	105
	Intervocalic	6.18	3.26	1041	118
GENDER	**Women**	-13.64	-2.14	1777	105
FOLLOWING VOWEL	/e/	0.45	0.11	731	101
	/i/	5.28	1.18	685	105
	/o/	2.44	0.54	705	114
SEGMENT: AGE	/tʰ/: Older	-1.45	-0.77	512	115
	/tʰ/: Younger	6.20	3.15	512	115
SEGMENT: GENDER	**/tʰ/: Women**	7.23	4.40	1107	116
PHONETIC ENVIRONMENT: GENDER	**Word initial: Women**	8.77	4.10	513	96
	V_V: Women	-1.08	-0.56	613	116
AGE: FOLLOWING VOWEL	Older: /e/	2.30	0.93	221	99
	Younger: /e/	5.95	2.22	199	97
	Older: /i/	1.56	0.61	183	103
	Younger: /i/	8.12	3.03	226	104
	Older: /o/	1.62	0.65	224	109
	Younger: /o/	11.67	4.32	203	114
GENDER: FOLLOWING VOWEL	**Women: /e/**	-7.85	-3.50	434	96
	Women: /i/	-5.22	-2.25	445	102
	Women: /o/	0.70	0.30	421	114
AGE: GENDER	Older: Women	10.96	1.07	565	104
	Younger: Women	17.75	2.39	484	102
AGE: REGION	Older: West	-2.77	-0.28	458	101
	Younger: West	-17.97	-3.04	487	102

Figure 12 displays the model predictions for VOT given the significant interaction between SEGMENT and AGE.[22] With respect to the VOT of /kʰ/, younger speakers are predicted to have a shorter VOT for /kʰ/ than middle-aged speakers ($p<0.05$), while the VOT of /tʰ/ remains fairly stable across generations. Speakers of all age groups have much lower VOT values for /kʰ/ than the earlier reported measurements, and speakers of all age groups distinguish between /kʰ/ and /tʰ/ in VOT with higher values associated with /tʰ/.
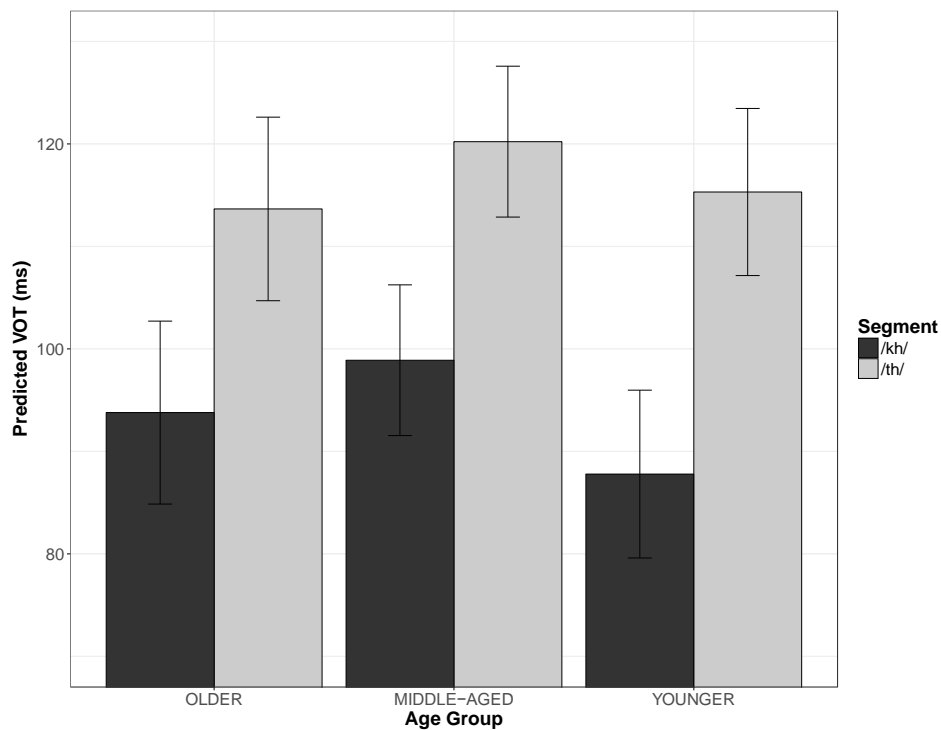
Figure 12. VOT by Segment and Age

Figure 13 displays the model predictions for VOT given the significant interaction between SEGMENT and GENDER. There is no significant difference between the genders; both men and women favor higher VOT values for /tʰ/ than /kʰ/, though women have a shorter

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[22] Error bars here, and in all graphs, reflect 95% confidence intervals.

VOT for /kʰ/ than men. These results show that speakers have consistently longer VOT values for /tʰ/ than /kʰ/ across age groups and genders.
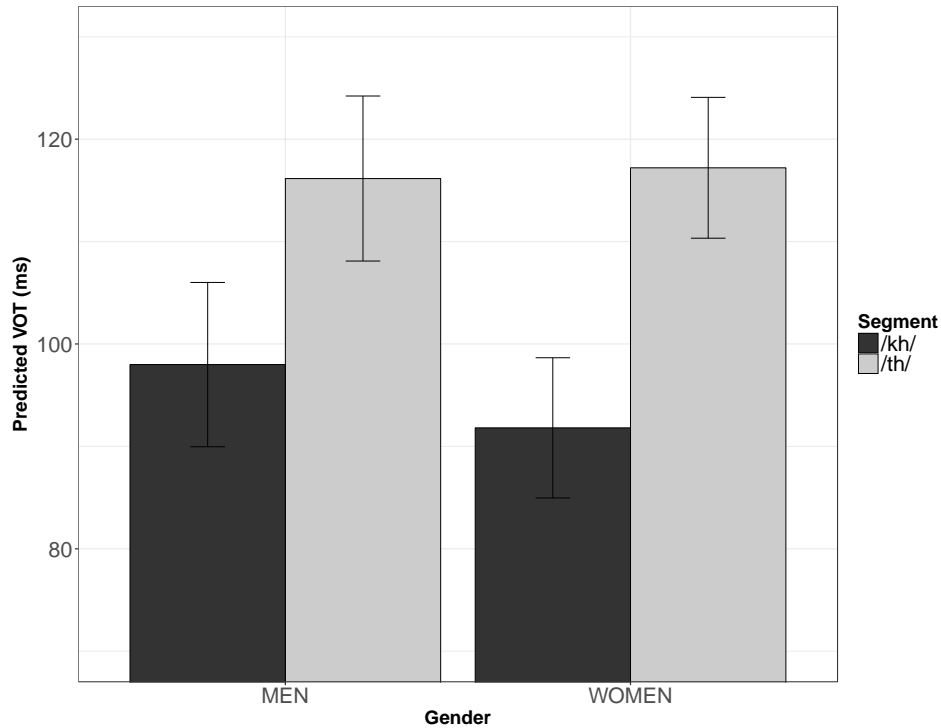
Figure 13. VOT by Segment and Gender

Figures 14 and 15 show the model predictions for VOT given significant interactions between AGE and REGION and AGE and GENDER. With respect to regional variation, there is a significant difference among the younger speakers (p<0.001): younger participants from the Eastern region in New Mexico favor higher VOT values than younger speakers from Arizona. As for gender, younger men are predicted to have a significantly lower VOT than middle-aged men (p<0.001). There are no significant differences between men and women of any age group.
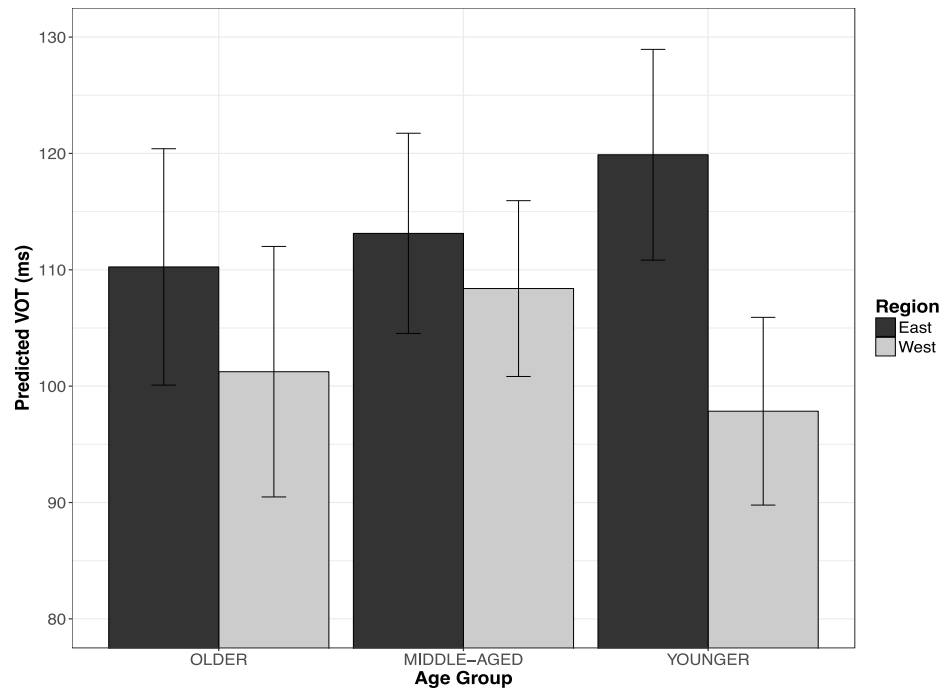
Figure 14. VOT by Age and Region
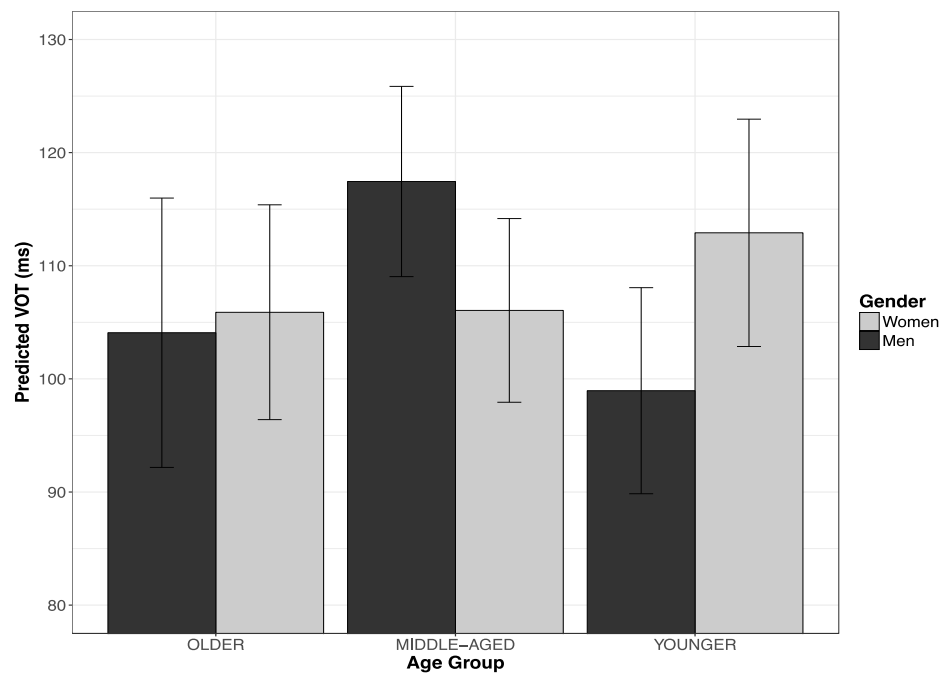
Figure 15. VOT by Age and Gender

4.6.3. CoG Statistical Results

The maximal model fit to CoG included the same independent predictors listed in table 10, along with their interactions. LANGUAGE BACKGROUND and VOWEL LENGTH were assessed as additive effects. The final model contained five significant interactions; three will be discussed in this chapter, while the remaining interactions are included in the appendix. The model output for the random effects can also be found in the appendix. The output for the final model (R^2=50%; cR^2=64%) is presented as square root transformed CoG values in table 13. The transformation was done to create more normal distributions in the raw Hertz measurements. Significant effects are again bolded in table 13.

Table 13. Fixed effects coefficients for model fit to CoG values

		Estimate	t-value	n	Mean CoG sq
INTERCEPT	**/kʰ/**	48.63	20.98	1086	56.8
	Following vowel /a/			771	54.5
	Older			896	57.8
	Eastern			1234	57.4
	Men			1112	55.2
	Long vowel			1134	60.4
SEGMENT	/tʰ/	0.71	0.79	1736	59.9
AGE	Middle-aged	2.65	0.98	1157	58.8
	Younger	2.60	0.93	769	59.6
GENDER	**Women**	9.18	3.32	1710	60.9
REGION	West	-1.16	-0.81	1588	59.7
FOLLOWING VOWEL	**/e/**	8.62	7.79	693	64.8
	/i/	10.49	8.85	664	69.6
	/o/	-9.07	-7.62	694	46.8
VOWEL LENGTH	**Short**	-1.08	-2.17	1688	57.6
SEGMENT: AGE	**/tʰ/: Middle-aged**	3.30	4.16	701	60.0
	/tʰ/: Younger	4.05	4.55	488	61.1
SEGMENT: GENDER	**/tʰ/: Women**	3.92	5.77	443	62.4
AGE: FOLLOWING VOWEL	Middle-aged: /e/	0.86	0.83	299	65.5
	Younger: /e/	0.56	0.47	180	63.5
	Middle-aged: /i/	3.08	2.84	266	69.7
	Younger: /i/	5.25	4.35	217	71.0
	Middle-aged: /o/	-0.56	-0.53	274	45.8
	Younger: /o/	4.06	3.45	196	49.0
REGION: FOLLOWING VOWEL	**West: /e/**	2.35	2.61	381	66.2
	West: /i/	1.85	1.99	398	70.7
	West: /o/	-0.96	-1.06	379	47.0
AGE: GENDER	**Middle-aged: Women**	-9.45	-2.77	691	59.5
	Women	-9.29	-2.58	458	61.0
	Younger: Women				

Figures 16 and 17 display the model predictions for CoG given the significant interactions between AGE and SEGMENT and GENDER and SEGMENT. The CoG values in figure 16 reflect a non-significant change-in-apparent-time effect of increasing CoG for /tʰ/ and decreasing CoG for /kʰ/. The segments are predicted to be most distinct in CoG among younger speakers. In the CoG model output in figure 17, women are predicted to have

significantly higher CoG values than men for /t^h/ (p<0.001) and slightly higher values for /k^h/.
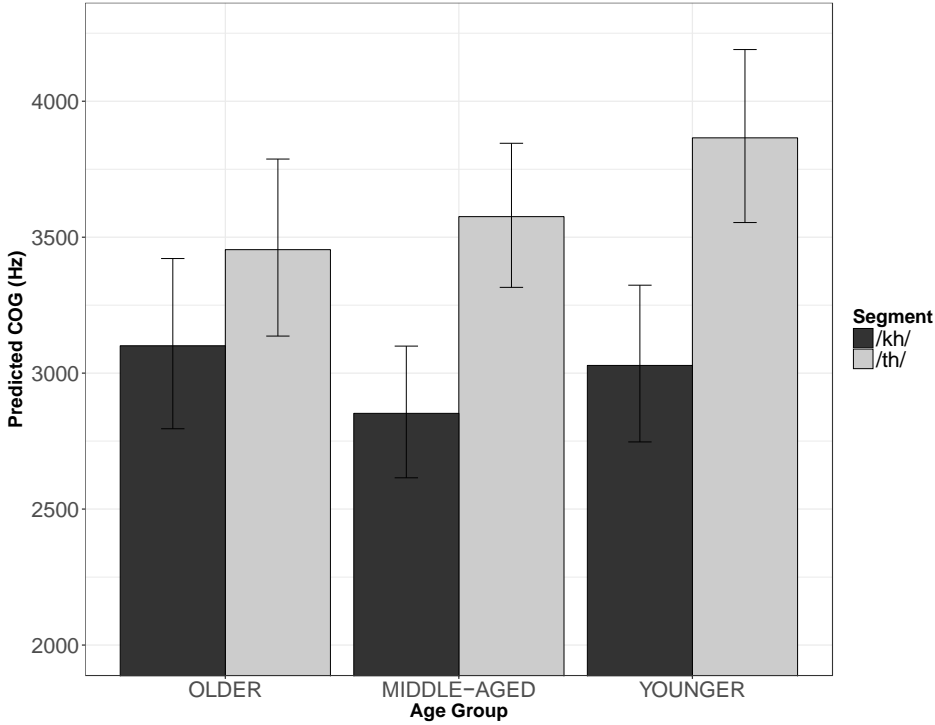
Figure 16. CoG by Age and Segment
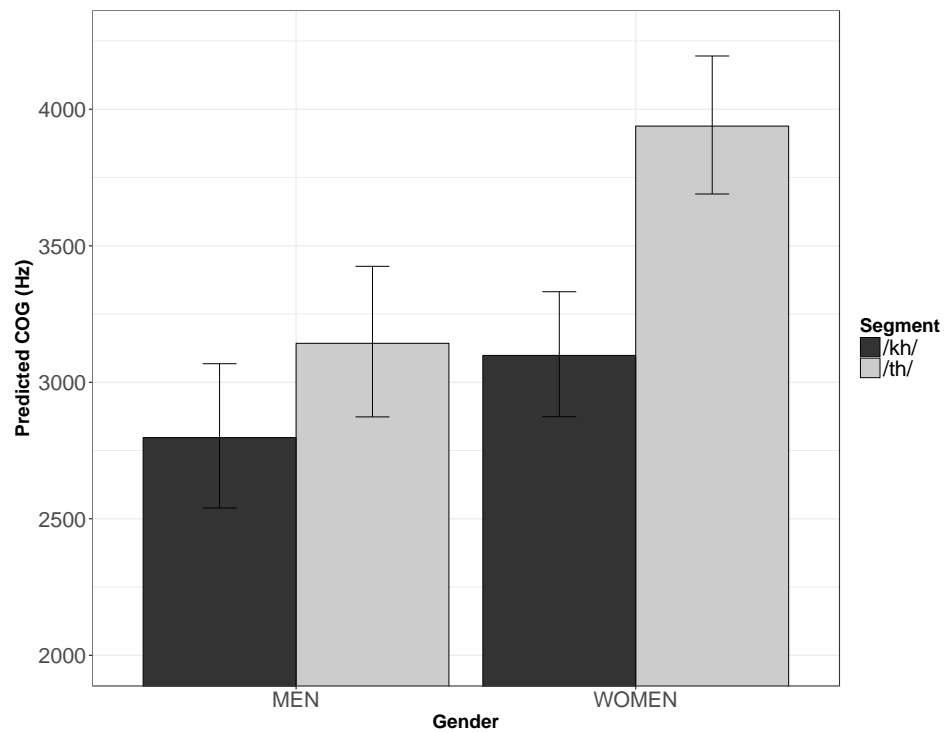
Figure 17. CoG by Gender and Segment

Figure 18 shows the model predictions for the significant interaction between AGE and GENDER. These results show that older women are predicted to have an overall significantly higher CoG than men (p<0.01). Gender differences within other age groups are non-significant.
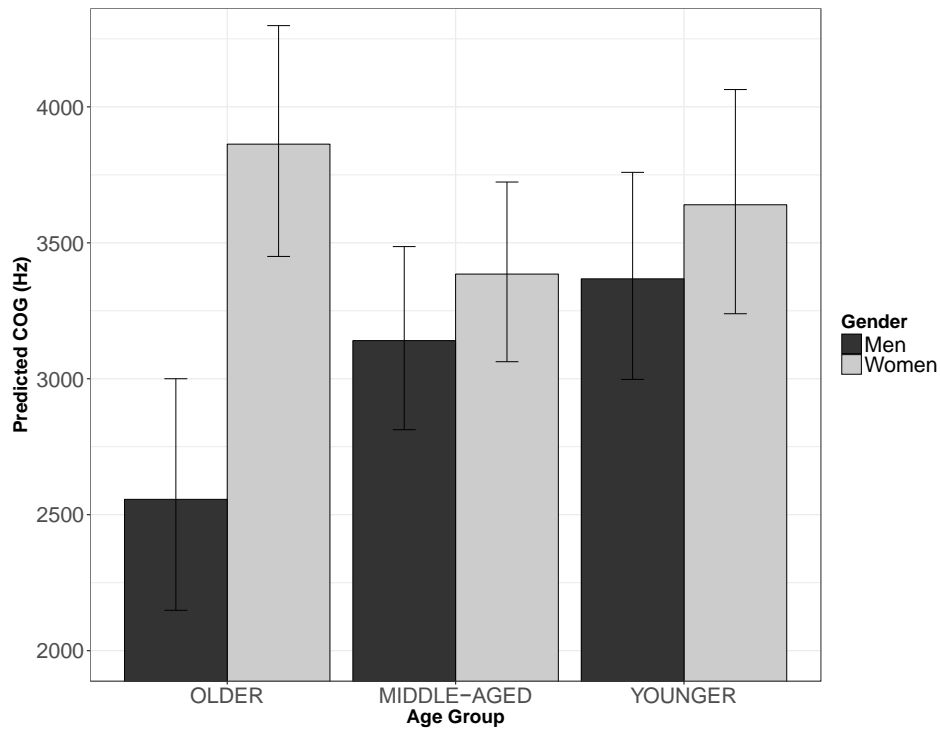
Figure 18. CoG by Age and Gender

As mentioned, there are additional significant effects for each model. For the model fit to VOT, the interactions between GENDER and PHONETIC ENVIRONMENT and GENDER and FOLLOWING VOWEL are each significant. These interactions indicate that women are predicted to show less variation in VOT by phonetic environment than men, while the interaction with FOLLOWING VOWEL could be a sign of gender-correlated variation in the vowel space, especially for the vowel /ɛ/. In the model fit to CoG, there are significant interactions between REGION and FOLLOWING VOWEL and AGE and FOLLOWING VOWEL. The model predictions for CoG are significantly different for all of the vowels (p<0.001), consistent with phonetic descriptions noting

different reflexes of the velar fricative release in different vowel contexts: [tç] before front vowels, [tx] before low vowels, and txʷ before [o] (McDonough 2003a: 156).

4.6.4. Diné Plain Velar Fricative

As a final comparison, results for the CoG of the release of /tʰ/ and /kʰ/ were analyzed alongside CoG values for the plain voiceless velar fricative /x/. The Diné velar fricatives are known to be variable, and different phonetic reflexes of /x/ are described as appearing before different vowels: the velar fricative is phonetically realized as the voiceless palatal fricative [ç] before front vowels, [x] before the low vowel, and [xʷ] before the round vowel (McDonough 2003a). Based on the patterns of these reflexes, it is clear that, "the vowel context has a very significant effect on both constriction location and degree" (Iskarous et al. 2012). Given this variation, the CoG of /x/ are expected to vary substantially depending on the following vowel.

Table 14 presents the mean CoG values for /x/, /tʰ/ and /kʰ/, along with measurements from an earlier phonetic study of /x/ (McDonough 2003a: 151). Standard deviations are shown in parentheses. It remains unclear why the current measurements for the CoG of /x/ are much higher than the earlier measurements, though possible explanations for these differences include changes in the articulation of the fricative, changes in the vowel space, or differences between the studies in terms of acoustic measurement procedures. The current values all have very wide standard deviations, evidence of significant variation within this group of speakers.

Table 14. Mean CoG by following vowel

	/ɪ/	/ɛ/	/a/	/o/
/x/	2779	1915	1368	482
(McDonough 2003a)	(1095)	(1344)	(552)	(417)
/x/	5408	4950	1907	1835
Current study	(2241)	(2204)	(1482)	(2179)
/kʰ/	4452	3795	2614	1681
Current study	(2211)	(2242)	(2127)	(1744)
/tʰ/	5046	4500	3015	2358
Current study	(2358)	(2356)	(2444)	(2405)

The spectrograms in figure 19 illustrate these differences in the realization of the velar fricative before each vowel. The first two spectrograms come from Gerald Pierce (pseudonym), an older man from New Mexico. The latter two spectrograms come from Jessica Dodson, a younger woman from Arizona. The spectrograms show how for both speakers, when /x/ occurs before front vowels as the voiceless palatal fricative [ç], the visible energy is much darker, evidence of more frication in the release. The high degree of labialization before [o] is evident in the approximant-like formant structure for [xʷo].

Gerald *hastiin* 'man'

Gerald *hééł* 'pack'

[x a s tʰ iːn]

[ç ɛː ł]
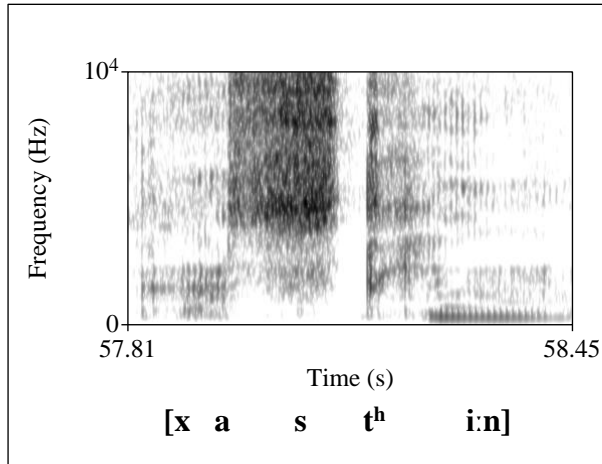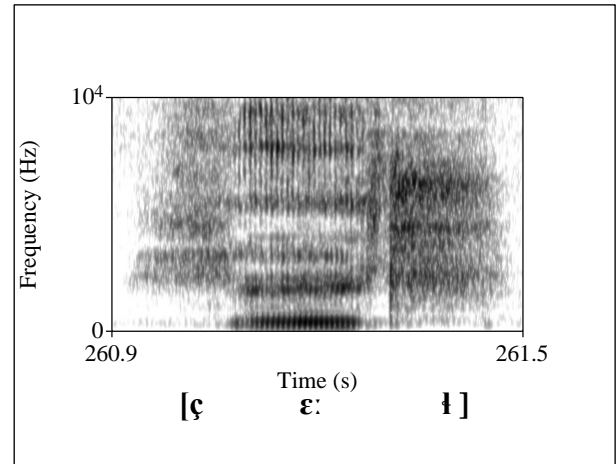
Jessica *hosh* 'cactus'

Jessica *his* 'pus'

[xʷ o ʃ]
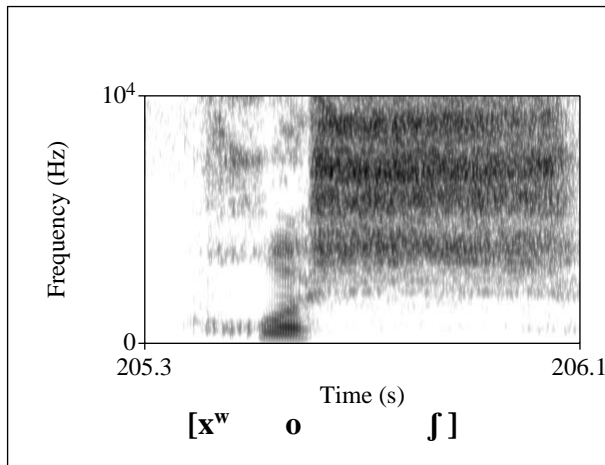
[ç ɪ s]
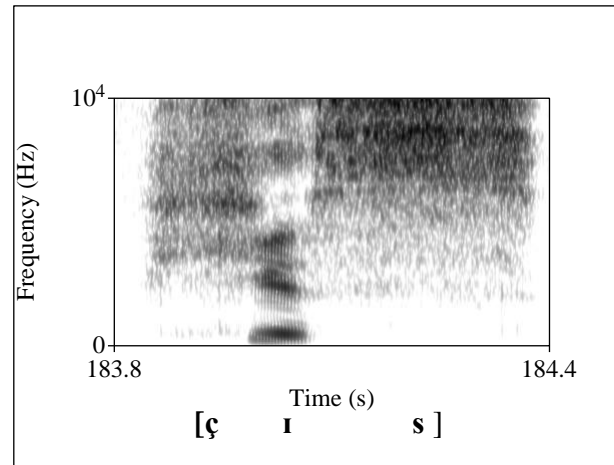
Figure 19. Spectrograms of words containing /x/ before different vowel

A model was fit to CoG following the same procedure outlined above, but this model also included the velar fricative /x/ as a SEGMENT level. The CoG values of /x/ were measured in Praat and similarly filtered from 200–12,000Hz. A total of 346 tokens of /x/ were included in the model, along with 827 tokens of /kʰ/, and 1280 tokens of /tʰ/ all from the elicited word list. The distribution of /x/ before different vowels is: 158 tokens before /a/, 66

before /ɛ/, 48 before /ɪ/, and 74 before /o/. The final model (R^2= 60%; cR^2= 70%) included WORD and SPEAKER as random effects and FOLLOWING VOWEL, AGE, REGION, SEGMENT, GENDER as fixed effects. Significant interactions included AGE and SEGMENT, FOLLOWING VOWEL and SEGMENT, AGE and REGION, FOLLOWING VOWEL and AGE, AGE and GENDER, FOLLOWING VOWEL and REGION, GENDER and FOLLOWING VOWEL, and REGION and SEGMENT. Discussion here will focus on the four interactions including SEGMENT, since I am most interested in comparing the CoG predictions for /x/ with those for /tʰ/ and /kʰ/. The full output from this model, along with graphs of the remaining interactions, is in the appendix.

Figure 20 displays the model predictions for CoG given the interaction between AGE and SEGMENT. Age groups are not significantly different from each other in CoG values, but the CoG of the segments do differ: the CoG of /tʰ/ is predicted to be significantly higher that the CoG of /x/ among the middle-aged (p<0.05) and younger speakers (p<0.001), the CoG of /tʰ/ is predicted to be significantly higher that the CoG of /kʰ/ among the middle-aged speakers (p<0.001) and younger speakers (p<0.001), but /kʰ/ is not predicted to be significantly different from /x/. Speakers of all ages have the highest predicted CoG values for /tʰ/.
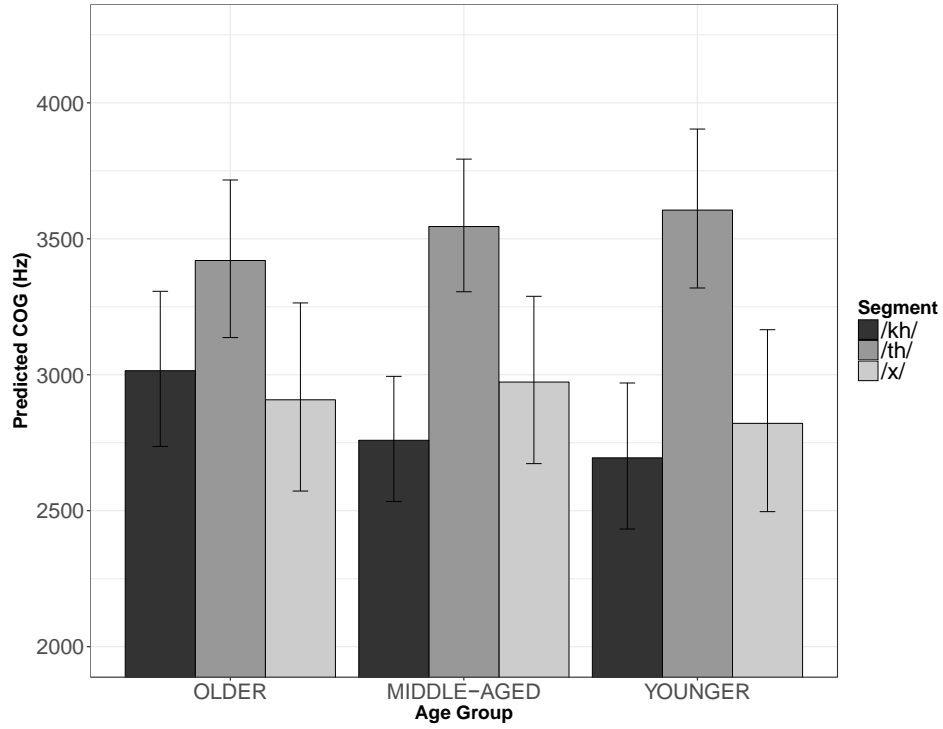
Figure 20. CoG by Segment and Age

Figure 21 shows the model predictions for CoG given the interaction FOLLOWING

VOWEL and SEGMENT. All three segments follow similar patterns whereby the CoG values

are significantly higher before front vowels than they are before back vowels (p<0.001).
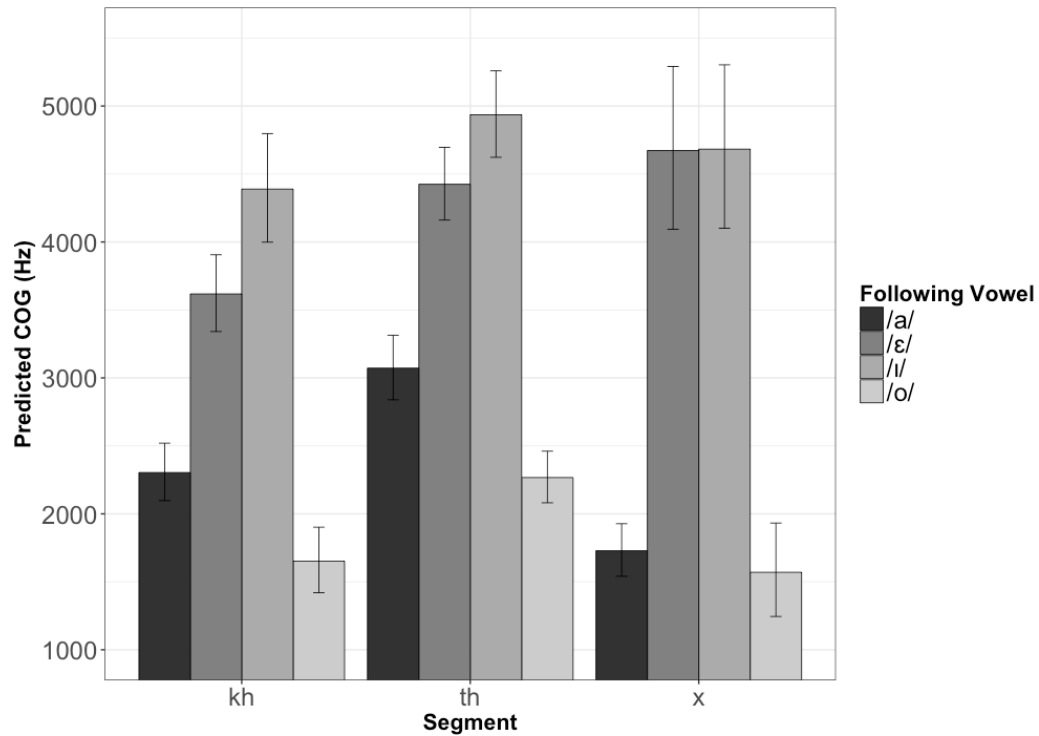
Figure 21. CoG by Segment and Following Vowel

Figures 22 and 23 show the model predictions for the significant interactions between GENDER and SEGMENT and REGION and SEGMENT respectively. Women are predicted to have significantly higher CoG values for /tʰ/ (p<0.01) and for /x/ (p<0.05). There are no significant differences in CoG values between speakers from the Eastern region and speakers from the Western region; speakers from both regions show similar patterns.
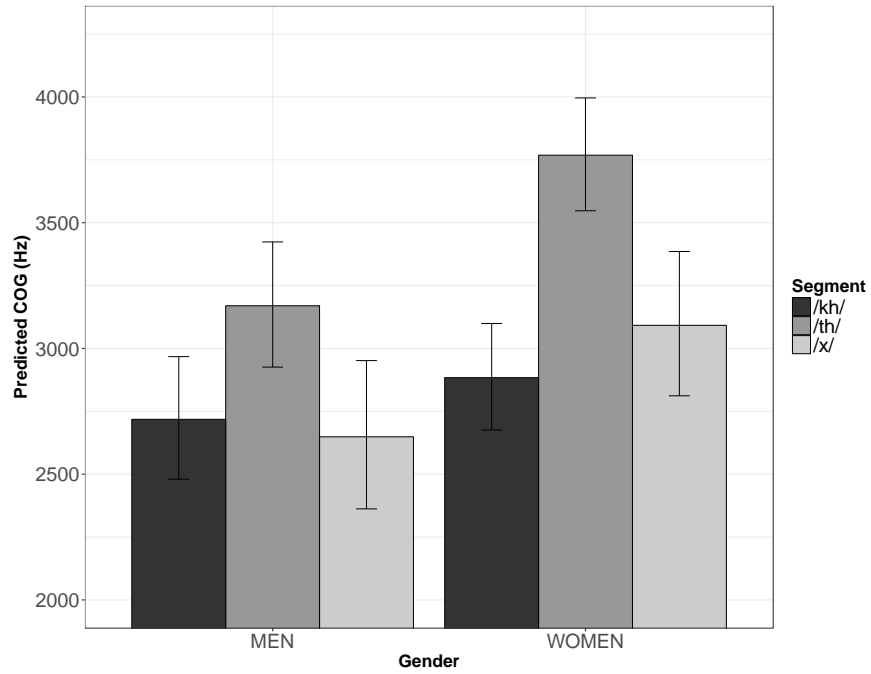
Figure 22. CoG by Gender and Segment
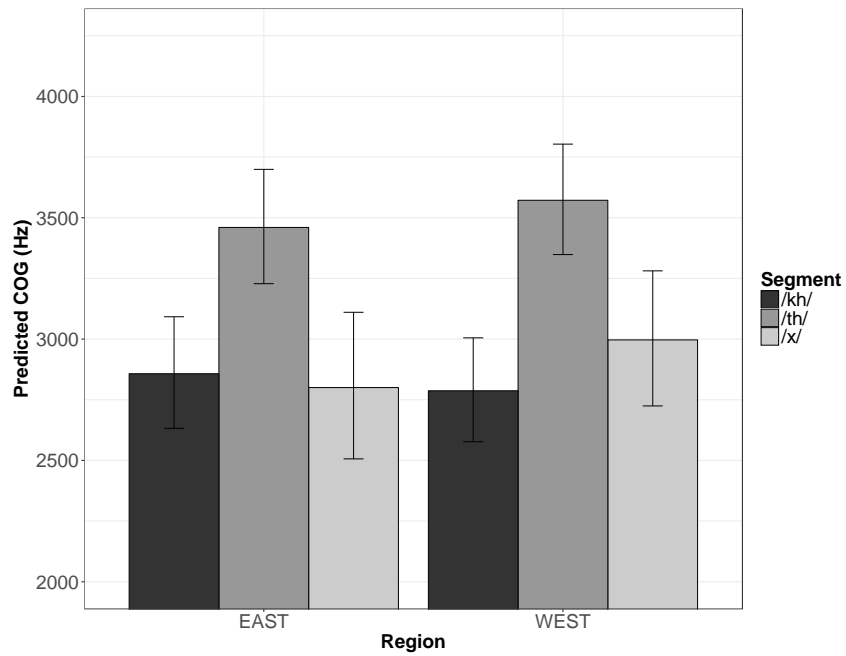
Figure 23. CoG by Region and Segment

4.7. Discussion

This chapter presented phonetic documentation of contemporary Diné bizaad stops with a focus on the voiceless aspirated stops /tʰ/ and /kʰ/. Analysis reveals that the laryngeal contrast marked by VOT is robustly maintained between unaspirated and aspirated stops, the VOT of /kʰ/ has shortened when compared with earlier measurements, while speakers have maintained the exceptionally long VOT of /tʰ/. At the same time, there is evidence of a non-significant spectral change-in-progress whereby the center of gravity of /tʰ/ is increasing in apparent-time while that of /kʰ/ is stable: higher CoG values, indicating a more anterior constriction, occur with /tʰ/ than with /kʰ/ or /x/. McDonough 2003a raises the question of how speakers distinguish /kʰ/ and /tʰ/: "given that the duration of the release portion of these stops is quite long, these usual cues to place of articulation are likely to be masked in the aspirated stop by their co-articulating velar release" (McDonough 2003a: 155). These data show that speakers mobilize the acoustic cues of VOT and CoG to distinguish between /tʰ/ and /kʰ/, with /tʰ/ having a longer and more anterior release than /kʰ/, and these results reveal a pattern of a non-significant change in apparent time where the CoG of /tʰ/ is increasing by generational age group. Multiple factors could contribute to speakers producing /tʰ/ with a higher CoG: speakers may have a more anterior supralargyneal constriction in the release of /tʰ/ than /kʰ/, a shift may have taken place in the place of articulation for /tʰ/ in either the burst or the transition into fricative release, or changes in CoG values may be impacted by ongoing changes in the vowel space.[23] Additional acoustic and articulatory measurements could clarify the nature of these sounds in future work. Overall, the documented trends point to ongoing

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[23] Thank you to Matt Gordon for bringing these points to my attention.

non-neutralizing subphonemic changes; the segments /k^h/ and /t^h/ appear to be becoming more distinct from each other in both acoustic parameters by generation.

I propose that a subphonemic change of timing has taken place for /k^h/, but not /t^h/ due to the perception of /k^h/ as sufficiently similar to English [k^h]; speakers have subconsciously shortened the release period to match the VOT of English, an effect that has been documented in other studies of bilingual speakers (Heselwood and McChrystal 1999; Fowler et al. 2008; Newlin-Łukowicz 2014). Even the oldest group of speakers, aged 59–78, show much shorter values for /k^h/ than in earlier data, and the younger speakers, aged 18–38, produce stops with the shortest release periods. The comparison with English data in figure 10 supports this analysis, as Diné /k^h/ and English [k^h] are more similar in VOT than the alveolar stops. Together, these results suggest that like those reported in Flege and Eefting 1987, speakers have established separate phonetic categories for English and Diné bizaad alveolar stops, but not the velar stops.

These findings raise the question of why speakers have established a new phonetic category for English [t^h], but not [k^h]. I argue that the salience, taken here to be "the degree to which something stands out relative to other, neighboring items" (Drager and Kirtley 2016: 12), of the affrication of /t^h/ is sufficient to distinguish it from English [t^h] and precludes any gradient convergence towards an English-like phonetic target. Evidence for the salient affrication of /t^h/ comes from several resources that consistently describe a more strongly fricated release for /t^h/ than for /k^h/. McDonough and Wood (2008) note that a similar pattern is found in other Dene languages as well. In the present data, when compared with /k^h/, /t^h/ has a longer release, a higher CoG, and a positively correlated and higher spectral standard deviation, indicative of dispersed frication energy. Given these acoustic characteristics, it is

more likely that speakers will attend to the affrication of /tʰ/ than /kʰ/, even if it remains below the level of conscious awareness. It might also be the case that the alveolar segment is phonemically an affricate /tx/ as suggested by Young and Morgan (1987). Though there are far fewer tokens of unaspirated /t/, the VOT values show evidence of a minor effect of real-time lengthening and dissimilation from English /d/, perhaps due to the association with Diné bizaad /tʰ/ or possibly with English [tʰ].

Despite this proposed salience of /tʰ/, in the interviews no participants explicitly mentioned affrication as something they noticed as varying, though a few speakers indirectly alluded to it in different ways. For instance, Louise Ramone, a Navajo language teacher, mentioned the harsher sounding [x] that she associated with older speakers. She also gave an example of how older speakers might say *łichxíí'* for red, while others would say *łichíí'*.[24] She refers to the [x] sound here as adding harsh tones (18106-38 Louise Ramone Interview 00:28:24.986). Shandiin Yazzie, a younger speaker, mentioned that Navajo Nation council members often talk: "like somewhere in your throat that they're trying to channel through" (18106-04 Shandiin Yazzie Interview 00:38:54.500). She accompanied this statement with an imitation that did in fact have strong affrication, but she may not have been explicitly attending to this strongly velarized frication. Ilene Ryan, another Navajo language teacher, described her impressions of older speakers this way: "I think it's a lot throatier and breathier. As to where when I speak, it's more surface-like, and maybe that's because of the English language" (18106-27 Ilene Ryan Interview 00:35:37.850). Anecdotally, a review of Diné text on social media shows that speakers often write <x> in words after <t>, or after the

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[24] This may be the expressive, augmentative use of [x] documented in Reichard 1948 and Webster 2013.

velar fricative <h>, but not after <k>. In sum, although for most speakers, variable affrication remains below the level of awareness, the salience of the affrication of /t^h/ may be sufficient to distinguish it from /k^h/, and the strong affrication precludes its participating in a shift towards an English-like phonetic target.

Finally, a statistical analysis reveals that the examined social factors do not significantly condition variation in these sounds. The most significant factor for both VOT and CoG remains the difference between /t^h/ and /k^h/ across speakers of different ages, genders, regional origin, and language backgrounds. In contrast to the aforementioned studies describing variable aspiration as a marker of region, in these data, the only significant regional difference is among the Eastern (New Mexico) younger speakers, who have overall longer VOT values than younger Western (Arizona) speakers. It remains unclear how this synchronic pattern relates to earlier perceptions of aspiration strength given the divergent trajectories of /k^h/ and /t^h/.

There is a noteworthy trend in how the data pattern by age and gender. For VOT, the overall pattern is for speakers to produce a shorter VOT with /k^h/ than /t^h/, and we find the lowest values for /k^h/ are produced by younger speakers. For CoG, the data show evidence of /t^h/ increasing in CoG, and women and young speakers produce the highest CoG values for /t^h/, two groups consistently associated with leading sound changes (Labov 1994). This finding aligns with the oft-observed result that women lead changes, a common conclusion in sociolinguistic research, but one that has been less frequently verified in Indigenous minority language communities (but see Ravindranath 2009).

In addition to these patterns, there is also a significant difference between older men and older women in CoG. Based on previous documentation of the language, a possible

explanation is that this difference reflects stylistic variation among contemporary older men, if they are articulating an [h] in the style of a certain type of leader. These segments are reported to vary where, "big orators such as Chee Dodge would make the softer *h* sound while an "old time man" would make the harder *x* sound" (Peery 2012: 118). This account remains unsubstantiated though and awaits further investigation of the social meaning that speakers associate with different variants.

4.8. Conclusions

This chapter provided phonetic and statistical analyses of the acoustic properties of VOT and CoG for Diné bizaad /t^h/ and /k^h/ with comparisons with Diné bizaad /k t x/ and English [t^h] and [k^h]. Despite intense contact, /t^h/ shows no evidence of convergence with English, while speakers have shortened /k^h/ in real-time, arguably motivated by the similarity to English [k^h]. The analysis shows little evidence of socially meaningful variation: results do not vary based on region or language background, while younger speakers have a shorter VOT for /k^h/, and women have higher CoG values in their articulation of /t^h/ and /x/.

Chapter 5

Variation and Change in the Lateral

Affricates

5.1. Introduction

This chapter presents an analysis of variation in the onsets of the Diné laterally-released affricates: unaspirated /t͡l/ ~ /kl/ and ejective /t͡ɬʼ/ ~ /k͡ɬʼ/. Beyond brief descriptions, these segments have not received much scholarly attention, and variable pronunciation has not been documented in published work. However, variants with velar onsets have been recorded in related Dene languages, and changes /tl/ > /kl/, along with the reverse /kl/ >/tl/, are common cross-linguistically (Blevins and Grawunder 2009). Through acoustic description alongside an analysis of the linguistic and social structure of this variation amongst the fifty-one speakers, this chapter presents evidence for incipient sound change in unaspirated /t͡l/ and ejective /t͡ɬʼ/. More specifically, this chapter has the following aims:

    i.   to provide synchronic phonetic descriptions of the unaspirated and ejective lateral affricates,

    ii.   to analyze how social and linguistic factors condition variation in onset place of articulation,

iii.   to evaluate results from statistical models for evidence of changes-in-progress

motivated by internal and external factors.

The remainder of this chapter will proceed as follows: in §5.2 I discuss some background on motivations for changes in these sounds. In §5.3 I introduce the variants under investigation. In §5.4 I present the methods, in §5.5 the results, and in §5.6 and §5.7 the discussion and conclusions respectively.

5.2. Motivation for Variation and Change

Variation between /t͡l/ ~ /kl/ and /d͡l/ ~ /kl/ has a well-attested phonetic motivation. From a phonetic perspective, a change in place of articulation from an alveolar to a velar onset could arise from the high degree of acoustic and perceptual similarity between the variants. This claim is supported by extensive research that has demonstrated that /tl/ and /kl/ clusters are acoustically similar and easily perceptually confused in several languages (Kawasaki 1982; Flemming 2007; Hallé and Best 2007). Even English plain stops /k/ and /t/ are confusable in certain contexts due to overlapping acoustic cues (Plauché 2001), and the lateral release of /tl/ and /kl/ further obscures existing cues for stop place of articulation. Based on data from English, Flemming (2007) suggests that there may be acoustic pressure to neutralize the distinction in favor of the velar onset because /gl/ bursts are spectrally closer to /g/, than /dl/ bursts are to the sound /d/. Speakers of some languages, such as Hebrew, do phonemically and acoustically distinguish between these clusters (Hallé and Best 2007), but the contrast is rare typologically (Bradley 2006; Flemming 2007).

Relatedly, given the high degree of interlingual similarity between Diné bizaad /t͡l/ and English /kl/, the observed variation could also be externally-motivated if speakers are

93

substituting the similar English cluster for the Diné affricates. As mentioned in chapter 1, when two languages are in contact, a driving factor of phonological change is presumed to be interlingual similarity, and segments with a phonologically similar counterpart in the dominant language may be particularly susceptible to convergence via phonemic transfer or substitution (Babel 2009). Examples of this kind of transfer include a change in Northern Paiute, a Uto-Aztecan language spoken in California and Nevada, where a younger speaker was found to categorically substitute English /s/ for Northern Paiute /ç/, and English /ʃ/ for a palatalized allophone after the high front vowel /i/ (Babel 2009). Likewise, in Kʷak'ʷala, a Wakashan language spoken in British Columbia, younger speakers reportedly were substituting the English cluster /gl/ for /t͡ɬ'/ due to pervasive English usage in the community (Goodfellow 2005). Even in these cases of attested contact-induced substitution, speakers may continue to show sensitivity to allophonic alternations, evidence that contact-induced change does not preclude the maintenance of phonological knowledge in a minority language (Goodfellow 2005; Babel 2009).

5.3. Diné Lateral Affricates

The targeted sounds are part of the Diné laterally-released affricate series: unaspirated /t͡l/ written <dl>, aspirated /t͡ɬ / written <tł>, and ejective /t͡ɬ'/ written <tł'>. These phonemes have been reconstructed to Proto-Dene and are present throughout the language family, though not all languages have the full lateral affricate series (Leer 2005; McDonough and Wood 2008). The segments are restricted to stem-initial position, and some of the /t͡l/ stems originate from

d-effect mutations (Young and Morgan 1987).[25] Young and Morgan provide the following

descriptions of these sounds:

> "<u>dl</u> an unvoiced, unaspirated unit phoneme made by placing the tongue in a Navajo
> d-position and proceeding to produce an <u>l.</u> In manner of production, Navajo <u>dl</u> is
> comparable to English <u>gl, bl,</u> as in glow, blow.[26]
> tł an unvoiced, aspirated counterpart of <u>dl.</u>
> tł' - is the glottalized counterpart of tł, produced in a manner comparable to that
> described for t', k', but with release of the air under pressure beginning from the ł -
> position" (Young and Morgan 1987: xv). [27]

Alveolar and velar onsets have been documented as freely varying in Dene languages

related to Diné bizaad. Regarding the pronunciation in San Carlos Apache, de Reuse (2006)

writes, "Some native speakers pronounce *tł* as the *cl* in *class*, *clue*, so it is all right to imitate

this pronunciation, but not all speakers will accept this pronunciation" (de Reuse 2006: 16).

In Slave, "The onset to the lateral affricates varies between alveolar [dl, tl tl'] and velar [gl,

kl, kl']" (Rice 1989: 31). Likewise, in Tlingit, variation is evidenced in the pronunciation of

the name itself: "The spelling of "Tlingit" represents a semi-Anglicized version of the word

łinkít, which means 'person' in this language. A more ruthlessly Anglicized pronunciation,

[klingkit], is commonly used in Alaska, including by many members of the ethnic group

concerned" (Maddieson et al. 2001: 136). Cook (1989: 244–5) similarly cites variation

between tł ~ ł and glottalized tł' ~ dl in different varieties of Dënesųłįné documented in Rice

1978. He argues that the observed variation reflects mergers due to lack of acquisition of the

contrast by less proficient speakers.

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[25] In this case, stem initial /l/ or /ł/ is pronounced [t͡l] <dl> when it occurs immediately after the classifier -*d*-.
[26] Alternatively, Faltz describes the unaspirated segments as: "a little like "dl" in the English word "saddle",
but faster" (Faltz 1998: 4)
[27] Though often treated as a voicing distinction in the literature, the manner of articulation of /l/ in /t͡l/ is
different from /t͡ł'/: /l/ is a lateral approximant while /ł/ is a voiceless lateral fricative (Hale and Honie ms).

No such variation in the lateral affricates has been documented for Diné bizaad, but personal accounts attest to /kɬ/ variants: I have heard the velar variants many times and have seen the name of the Mud Clan, *hashtɬ'ish,* written <hashkɬ'ish> on pottery for sale at a local flea market. Relatedly, there is evidence that these affricates have long been associated with the English clusters /kl/ and /gl/. For instance, the English cluster /kl/ is a common substitution for /tɬ'/ in loanwords. The name for the town *Beclabito* is an adaptation from Diné *Bitɬ'ááh Bito* 'spring underneath' (Young and Morgan 1987: 251), and the last name *Clah* is said to come from *tɬ'aa'í* meaning 'left-handed one' (Newcomb 1964). Furthermore, Diné bizaad speakers were reported to substitute /dl/ for English /gl/ and /tɬ/ for English /kl/ when reading aloud (Cook 1966: 24).

5.4. Methods

In order to acoustically analyze the variants, tokens of unaspirated /t͡ɬ/ and ejective /t͡ɬ'/ were collected from the wordlist and connected speech data. The number of tokens per speaker ranges from 5 to 52, with an average of 17. The aspirated affricates were not analyzed and will not be discussed due to low token numbers, though the available tokens show similar patterns to the unaspirated and ejective affricates. After segmenting the affricates in Praat, I coded each token for an audible velar or alveolar onset.[28] A comparison of the acoustic cues of the plain unaspirated stops /t/ (n=133) and /k/ (n=181) was conducted using wordlist data from the same speakers in order to assess the acoustic effects of the lateral release on cues for place of articulation. For all spectral measurements, I follow Sundara 2005 and Chodroff and

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[28] In 15 ambiguous cases, I verified my auditory coding with two other native English-speaking linguists. Due to low numbers, I left out tokens occurring before the diphthong /ei/ (n=2) and lateral releases without audible plosive onsets (n=5).

Wilson 2014 in resampling the audio at 16000 Hz, pre-emphasized by 6dB above 1000Hz, and high-pass filtered at 200Hz.

A number of acoustic measurements were recorded from the affricates including spectral peak, spectral center of gravity (CoG), voice-onset time (VOT), and the duration of the lateral in the case of the unaspirated affricates. The results will focus on the measurements of spectral peak and VOT (Kent and Read 1992; Stevens and Blumstein 1978).[29] Praat scripts were used to measure the peak frequency of the highest amplitude peak between 500–6000Hz with the release of the stop as the window of analysis. Alveolar stop releases with a short front cavity tend to have higher frequency peaks of energy, while velar stops have a larger front cavity and lower frequency peaks in spectra (Johnson 2003). As a comparison, English medial /gl/ clusters have a longer burst duration than /dl/ and a peak frequency of around 1200Hz compared with 2100Hz for /dl/ (Flemming 2007).

Following McDonough 2003a, VOT was measured in Praat from the release of the stop until the onset of voicing of either the following vowel with the ejectives, or of the lateral in the case of the unaspirated stops. For the ejectives, VOT measurements include a long period of silence. There were a number of ejective releases, and one unaspirated release where there was no audible lateral: /t͡ɬ'/ > /t'/. I indicated the presence of an audible lateral by a categorical coding of LATERAL YES or NO. In the present data, it was often difficult to consistently distinguish the stop burst from the onset of lateral frication, so VOT was used as a measure of duration instead of duration of the stop burst alone.

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[29] I had originally intended to analyze stop burst frequency as an acoustic correlate for place of articulation. However, the spectral peak measurements of the stop bursts showed a bi-modal distribution with frequencies clustered around 2000Hz and 5000Hz for both velar and alveolar onsets. Therefore, though spectral peak provides information about the spectral shape of these segments, this measurement does not consistently correlate with the annotated place of articulation.

After collecting the acoustic measurements, I then annotated each token for relevant linguistic and social factors including SOURCE of the data, PHONETIC ENVIRONMENT, FOLLOWING VOWEL, REGION, GENDER, and LANGUAGE BACKGROUND. I fit two logistic regression models to onset place of articulation using the *glm* and *glmer* functions with a logit link from the *lme4* package (Bates et al. 2015) in R (R Core Team 2017). Further, I employed Tukey post-hoc contrasts using the *glht* function in the *multcomp* package (Hothorn et al. 2008) to analyze pairwise comparisons. The list of categorical annotated predictors is presented in table 15; the variable AGE was tested as a numerical variable, number of years.

Table 15. Annotated Categorical Variables and Levels[30]

Variables	Levels	Unaspirated n	Ejective n
ONSET PLACE	Alveolar	173	305
	Velar	36	215
SOURCE	Wordlist	91	368
	Discourse	118	152
FOLLOWING VOWEL	a	58	45
	e	21	24
	i	27	240
	o	103	211
PHONETIC ENVIRONMENT	Word-initial	9	393
	V_V	82	86
	C_	118	41
AUDIBLE LATERAL	Yes	208	389
	No	1	131
GENDER	Man	86	219
	Woman	123	301
REGION	East (New Mexico)	75	230
	West (Arizona)	134	290
LANGUAGE BACKGROUND	Heritage language speaker	24	64
	L1 both bilingual	14	26
	L1 Diné bizaad bilingual	163	414
	L1 English bilingual	8	16

5.5. Results

Across both segments, speakers favor alveolar onsets in 66% of total tokens. The variants are equally common in wordlist and narrative data, suggesting that these forms are not overtly stigmatized. Though not statistically significant, velar onsets are most common across both types of affricates before the vowel /i/. More variation in this phonetic environment is in line with research demonstrating that acoustic differences between velar and alveolar stops are

[30] I initially annotated each observation for additional factors including whether the speaker was a Navajo language teacher, the L1 of the speaker, and the primary language of the speaker. There were no noteworthy patterns based on these factors.

minimal before high front vowels (Plauché 2001). Table 16 presents an overview of the distribution of each variant.

Table 16. Distribution of Affricates by Place of Articulation

	Unaspirated	Ejective	Total
Alveolar	173 (83%)	305 (59%)	478 (66%)
Velar	36 (17%)	215 (41%)	251 (34%)
	n=209	n=520	n=729

Table 16 shows that speakers strongly favor alveolar onsets at 83% for the unaspirated stops with minimal intraspeaker variation; only four speakers produce tokens of both variants. Most of the unaspirated affricates with velar onsets are produced by young women who realize 63% of their tokens with [kl] versus 21% among young men. The ejective affricates show a more balanced distribution, though alveolar onsets are still favored at 59%. There is also much more intraspeaker variation in the ejective affricates; 38 speakers use both variants.[31]

Examples (18) and (19) and the accompanying spectra in figure 24 show a case of rare intraspeaker variation in the unaspirated affricates: the narrator, Kendralyn Begay, pronounces the same word with different onsets at different points in her narrative. In the spectrum, the red line reflects the <gl> [kl] token and the blue line the <dl> [tl]. There are slight spectral differences between the variants, but the overall shape is very similar.

(18)   *'Áadi 'éí nihi naal**dl**ooshii hóló̧,*
    'áadi   'éí   nihi   naaldlooshii   hóló̧
    there   DEM   our   livestock   have.IPFV
    'There we have livestock,'
                        (18106-05 Kendralyn Begay Interview 00:20:29.931)

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[31] There is also more overall variation in how the ejectives are realized. Some tokens had no lateral release: [t' ~ k'], a few had no plosive onset [ɬ'], and some speakers produced a metathesized [t'ɬ]. Some speakers even generalized the ejectives to unexpected contexts such as [jɪstɬa] 'He/she put lotion on his/her hands' realized as [jɪsgɬ'a]. In related Dënesųłiné, Cook (1989) likewise reports variation in the ejective segments.

(19) *'Áádóó naalglooshii dawóozhi',*
      'áádóó naalglooshii   da–wó–jí=gi
      then   livestock   DISTR–3OBJ–name.how.to
      'Then naming of animals,'

                                      (18106-05 Kendralyn Begay Interview 00:17:22.911)
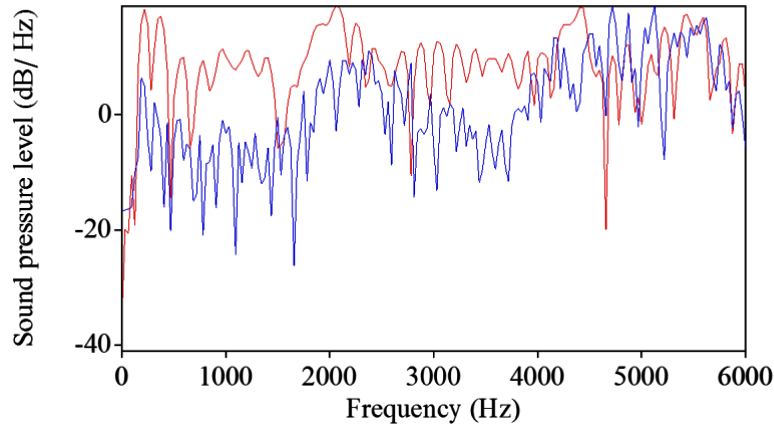
Figure 24. Spectrum Showing Intraspeaker Variability in the Unaspirated Affricates

Two additional spectra in figure 25 illustrate the spectral characteristics of [t͡l] and [kl].

The spectra come from stop bursts in the word *yishdloh* 'I am laughing' from the wordlist data

with each line representing data from a different speaker. Spectrum (a) presents four lines,

one from each token of *yishdloh* with an alveolar [t͡l]. Spectrum (b), shows four lines for tokens

with a velar [kl] onset. The falling spectrum at lower frequencies is characteristic of a velar

onset, while the alveolar spectrum is flatter; spectra from both places of articulation show

significant variation.

a) [jɪʃtlo]
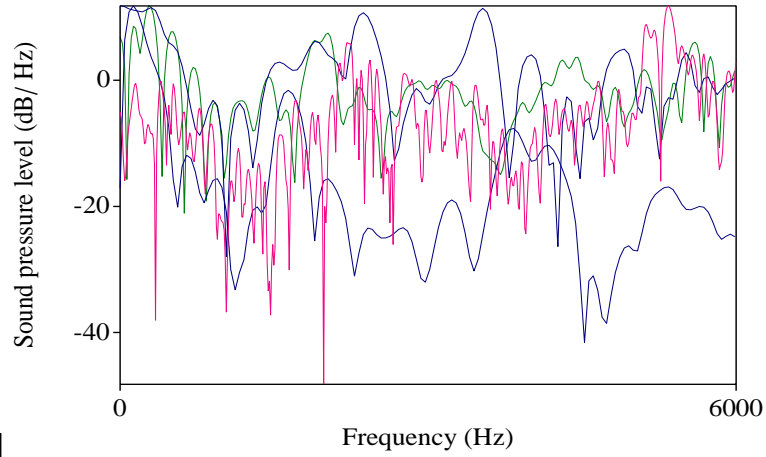
b) [jɪʃklo]
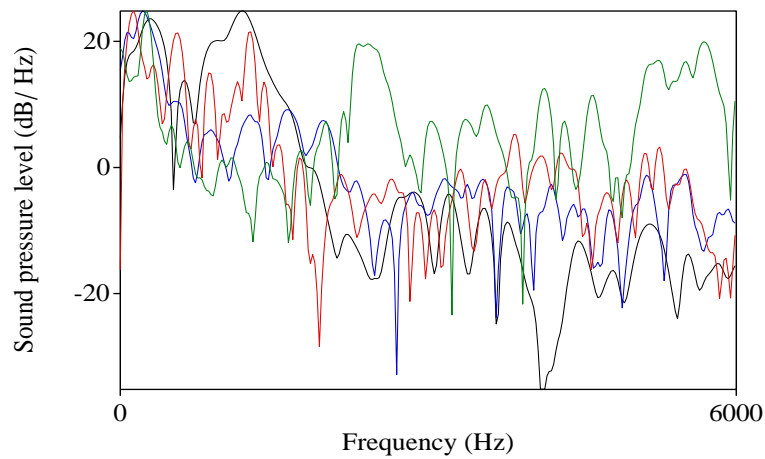
Figure 25. Spectra Showing Variable Onsets in the Unaspirated Affricates

Spectra in figure 26 show ejective affricates with alveolar and velar onsets. These spectra are less distinct from each other, though like with the unaspirated stops, the alveolar variant has a flatter spectral shape. The spectrum in (c) shows two lines representing tokens of *tɬ'óo'di* 'outside' produced with an alveolar onset. The second spectrum (d) shows two

lines from tokens of *tł'óo'di* with an audible velar onset. A sharp fall at lower frequencies is again visible.

c) [tł'oːtɪ]

d) [kł'oːtɪ]
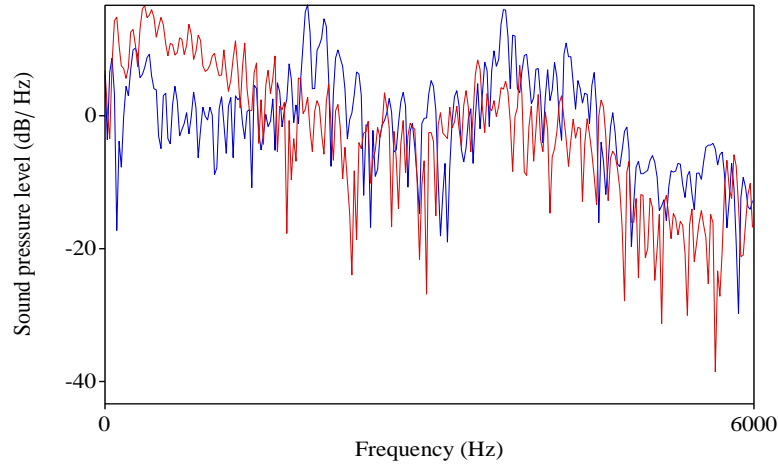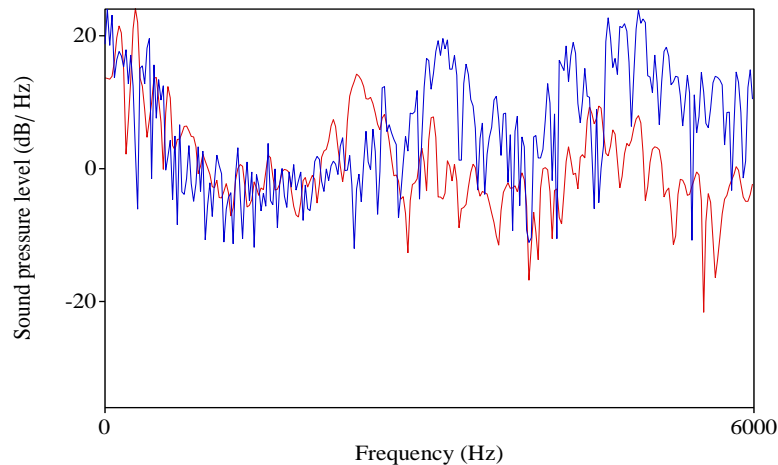
Figure 26. Spectra Showing Variable Onsets in the Ejective Affricates

The onset variation in these sounds is not particularly salient to participants; only Navajo language teachers commented on the variation. For instance, Peggy Manygoats, a Navajo language teacher in Page says, "With the consonants, the <tł'>, anything they don't

see as English [is difficult for students]" (18106-14 Peggy Manygoats Interview 00:26:09.830). Mrs. Manygoats ascribes the pronunciation difficulty in the ejective affricates to the vast difference between these Diné sounds and English consonants. Mary Whitehair Frazier, a Navajo language teacher in Albuquerque, echoes a similar sentiment in her interview: "And then the younger generation because of the pronunciation, because of the Navajo sounds, especially the glottalized and the digraphs, they're not hearing it, so like *tł'ízí,* it becomes *kłízí*" (18106-29 Mary Whitehair Frazier Interview 00:29:16.545).

5.5.1. Acoustic results

As shown in figure 27, while the plain stops /t/ and /k/ are well-differentiated from each other in VOT—VOT mean for /k/ is 26ms (sd=10); VOT mean for /t/ is 14ms (sd=6)—there is much more overlap and no statistically significant difference between the VOT of /t͡l/ and /kl/ (p=0.53).[32] The lateral release lengthens the plosive onset for both alveolar and velar segments and obscures the contrast. The [t͡l] variant has a mean VOT of 40ms (sd=20) compared with a mean of 32ms (sd=18) for [kl], very similar to the mean VOT of the plain stop /k/. Present VOT values are similar to earlier measurements for /t͡l/ (mean=42; sd=20) (McDonough and Ladefoged 1993). In these segments, the lateral releases of the unaspirated affricates are fully voiced by most speakers; this differs from earlier descriptions that describe the voicing of the lateral as beginning one-third of the way into the lateral (McDonough and Ladefoged 1993).

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[32] The horizontal line in boxplots reflects the median.
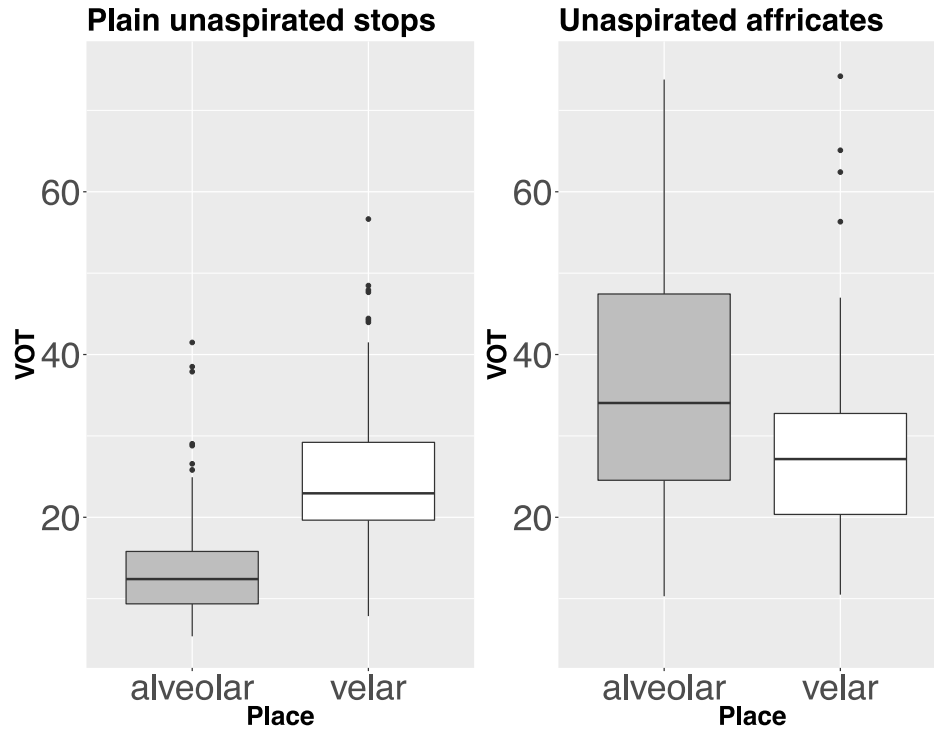
Figure 27. VOT of Unaspirated Stops and Affricates

Figure 28 shows that the plain unaspirated stops are similarly well-differentiated by spectral peak with a mean peak for /t/ of 4072Hz (sd=1578) and a mean peak for /k/ of 1480Hz (sd=866).[33] The affricate variant [kl] likewise has a lower spectral peak than [tl] (p<0.05), though as demonstrated by the length of the boxplots, there is substantial variance in these values. Whereas in English the lateral release of medial /dl/ moves the spectral peak closer to the acoustic realization of /g/, in Diné bizaad, the mean spectral peak of /t͡l/ 3980Hz (sd=1451) remains similar to plain /t/ and higher than the mean peak of 3357Hz (sd=1876) for [kl].

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[33] This can be compared with a mean burst frequency averaged across all vowels of 3,600Hz for English /t/ (Zue 1976: 112) and 1,910Hz for English /k/ (Zue 1976: 119).

105
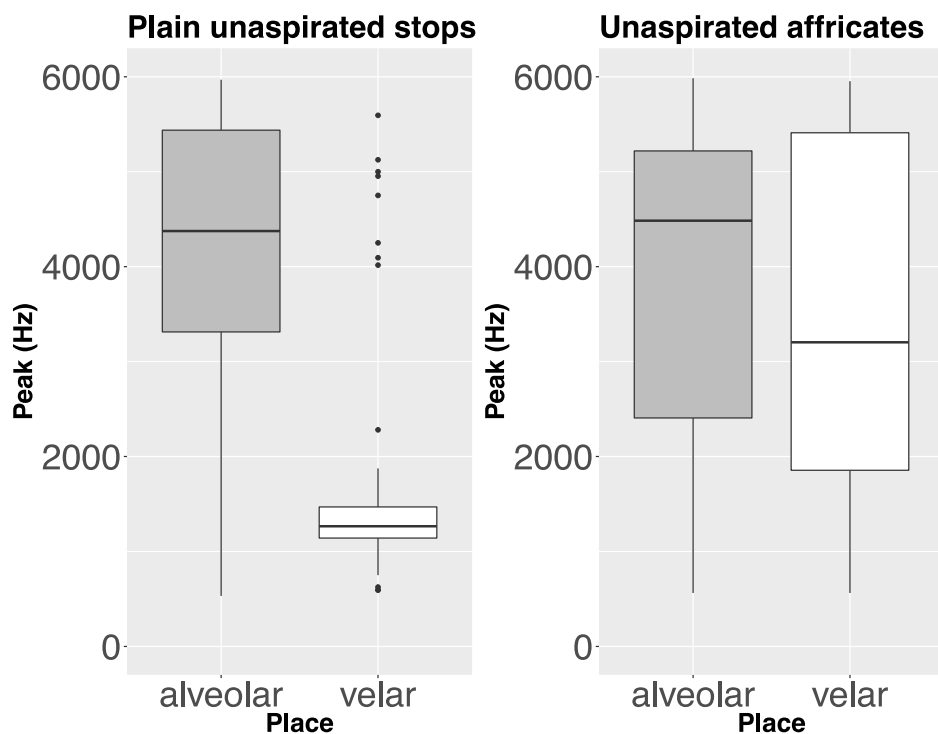
Figure 28. Spectral Peak of Unaspirated Stops and Affricates

A similar comparison with plain ejectives is not available, but an analysis of VOT values by onset place and age group shows that the VOT of ejective affricates with velar onsets is longer than ejective affricates with alveolar onsets: the mean VOT for [kɬ'] is 109ms (sd=39) compared with 100ms (sd=36) for [t͡ɬ'], though this difference is only significant for older speakers (p<0.001). Figure 29 shows VOT by onset place and generational age group. These VOT values are much shorter than previous measurements reported for /t͡ɬ'/ (mean=157ms; sd=40) (McDonough and Ladefoged 1993: 154)
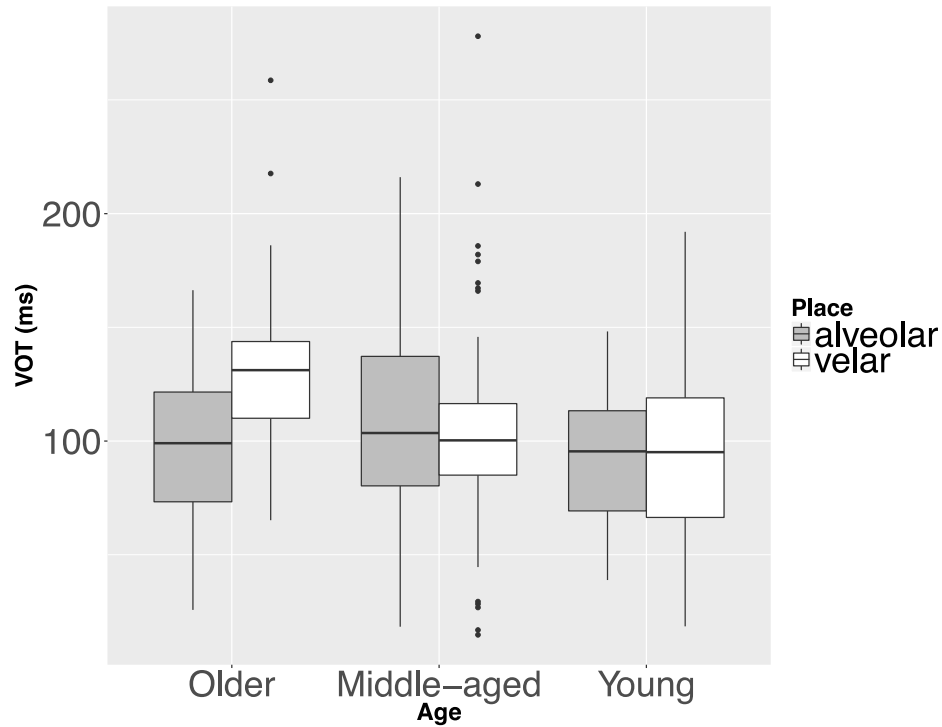
Figure 29. VOT of Ejective Affricates by Age Group

Spectral peak measurements for the ejective affricates differ significantly by onset place of articulation again only among the older speakers (p<0.001). Overall tokens of [kɬ'] have a mean frequency of 3424Hz (sd=1574) and tokens of [tɬ'] a mean of 3957Hz (sd=1482). Figure 30 presents the observed spectral peak measurements by generational age group and onset place of articulation.
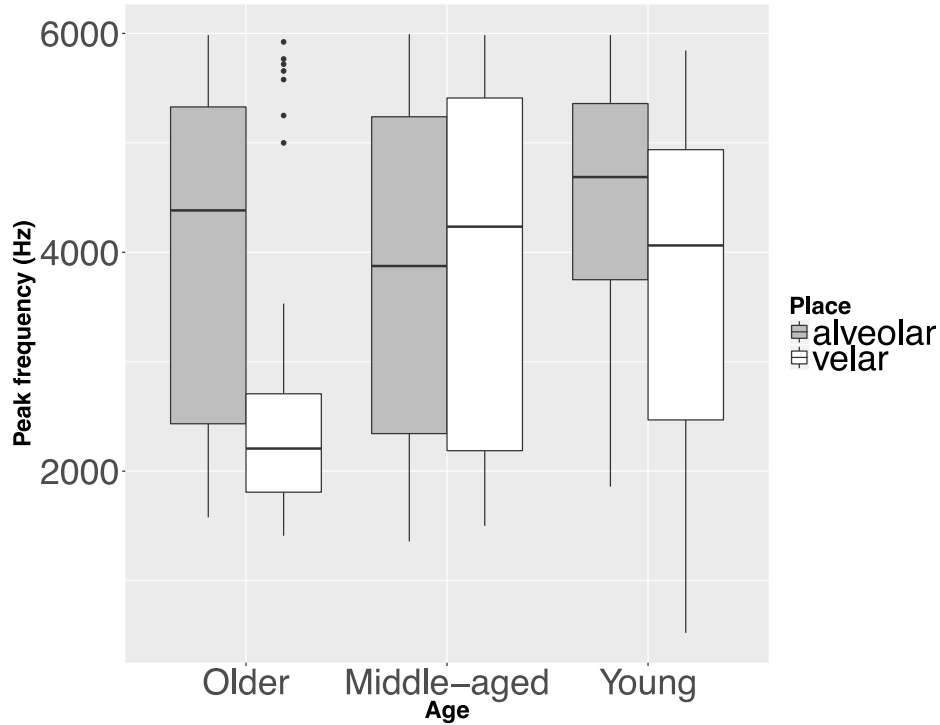
Figure 30. Spectral peak of ejective affricates by age group

5.5.2. Regression Results

Logistic regression models were fit to ONSET PLACE of articulation for the unaspirated and ejective affricates. For the unaspirated segments, the final model was fit with the *glm* function and includes only AGE in years, as a numerical predictor.[34] Results for the model fit to the unaspirated affricates are displayed in table 17 in the form of log odds predictions for velar onsets. The final model ($\chi^2 = 75.21$, *df= 1, p<0.0001*) has an R^2 value of 0.57, and a C-value of 0.898.

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[34] Though it is standard in quantitative sociolinguistic analyses to fit a model with SPEAKER and WORD as random effects, due to low token counts, the model for unaspirated affricates did not converge with random effects. When a summary of observations from each speaker was analyzed, AGE was still statistically significant, supporting the validity of the output from the *glm* model.

Table 17. Coefficients in model fit to unaspirated onset place

	Estimate	Std. Error	z value	Pr(>|z|)
INTERCEPT	3.66	0.74	4.94	7.94e-07
AGE	-0.14	0.02	-6.32	2.62e-1

Figure 31 shows the more interpretable probabilities generated by the *effects* package in R (Fox et al. 2015). The predicted probability of a velar onset is presented on the y-axis and AGE is labeled on the x-axis with tick marks indicative of the age of each speaker. This graph shows a sharp increase in predicted velar onsets as age decreases: younger speakers are predicted to favor [kl], while older speakers are predicted to favor [t͡l]. This distribution shows that the velar onset variant is produced only by speakers under the age of 50.
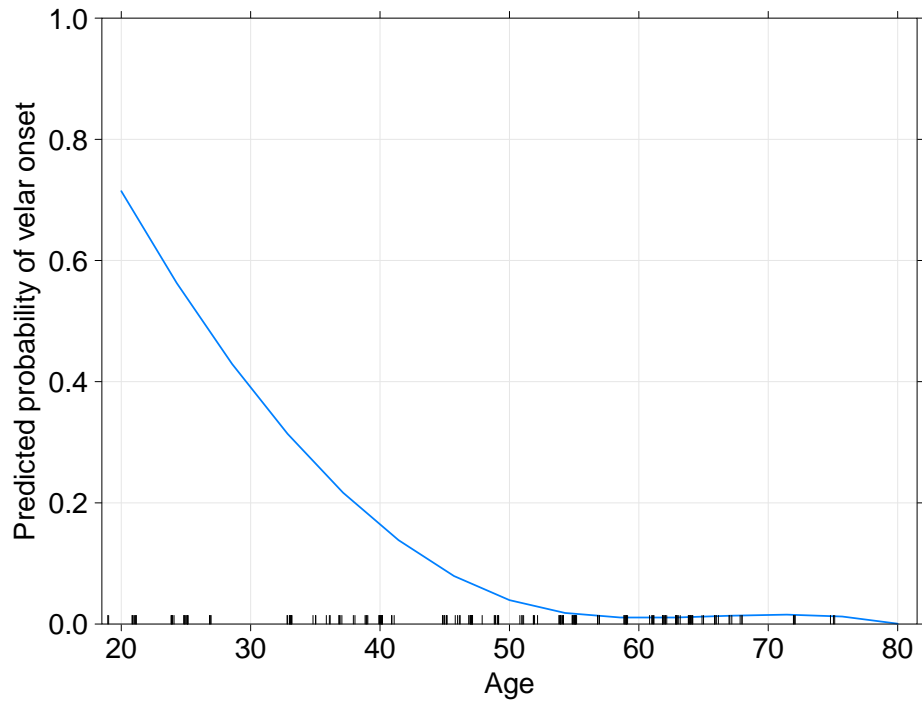
Figure 31. Probability of velar onsets in unaspirated affricates by age

Next, a model using *glmer* was fit to ONSET PLACE of the ejective affricates. The final model included SPEAKER as a random effect adjustment to the intercept, while WORD was removed during model selection. The final model included main effects: AGE, LANGUAGE BACKGROUND, AUDIBLE LATERAL, and PHONETIC ENVIRONMENT. Table 18 shows the model output in logodds *(R^2m= 0.3048; R^2c=0.526441)*. The random effects output is included in the appendix.

Table 18. Coefficients for model fit to ejective onset place

		Estimate	Std. Error	z value	Pr (>|z|)	n	Rate of velar onset
INTERCEPT	C_	1.77	0.98	1.80	0.07	41	15%
	Heritage language speaker					64	50%
	No Lateral					131	65%
AGE	-	-0.06	0.02	-3.17	0.002	-	-
LANGUAGE BACKGROUND	L1 both bilingual	3.10	1.21	2.57	0.01	26	92%
	L1 English bilingual	-0.29	1.27	-0.23	0.82	16	31%
	L1 Diné bizaad bilingual	0.16	0.69	0.24	0.81	414	37%
LATERAL	Yes	-1.43	0.29	-4.93	8.32 e-07	389	33%
PHONETIC ENVIRONMENT	Word-initial	1.74	0.55	3.15	0.002	393	48%
	V_V	0.25	0.62	0.39	0.69	86	23%

The AGE variable was again a significant predictor in this model. Figure 32 shows the predicted probability of velar onsets in the ejective affricates on the y-axis and AGE in years on the x-axis. Similar to the results in figure 31, younger speakers are predicted to produce more velar onsets, though the effect is more gradual than for the unaspirated segments. Speakers of all ages show variation between both onsets, with speakers younger than 45 predicted to favor velar onsets, and speakers older than 45 predicted to favor alveolar onsets.
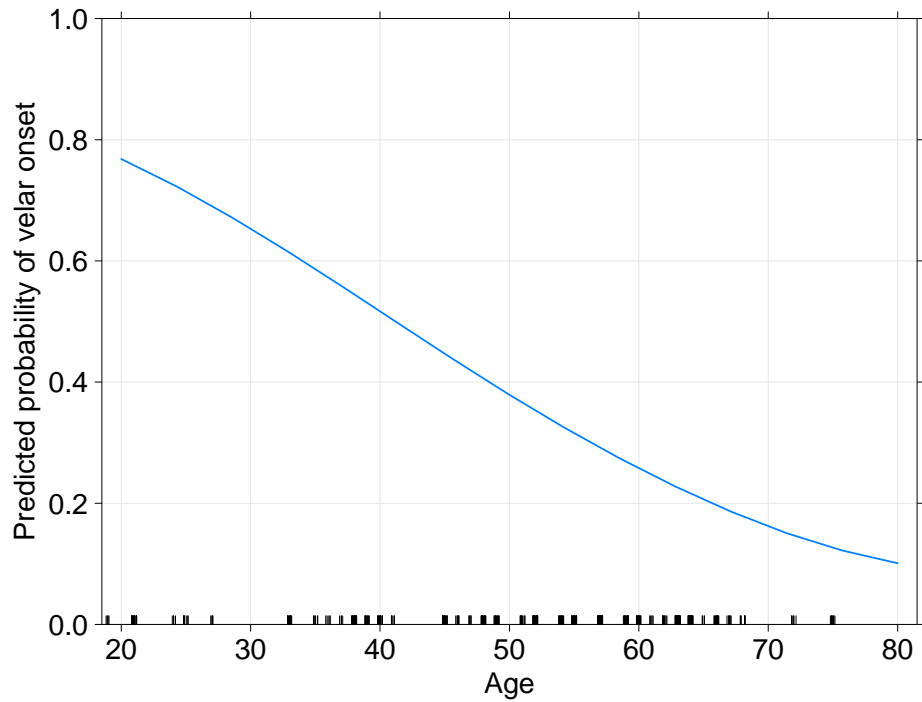
Figure 32. Probability of velar onsets in ejective affricates by age

The predictor LANGUAGE BACKGROUND is also significant in this model with results displayed in figure 32. Simultaneous bilinguals (L1 both bilingual) who acquired both languages simultaneously in childhood have significantly different results than the other bilinguals. The model predicts that for simultaneous bilinguals, nearly all (94%) of their tokens will have velar onsets. The other groups of bilinguals vary but are predicted to favor alveolar onsets.[35]

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[35] There are 4 simultaneous bilinguals with 26 tokens and 2 L1 English sequential bilinguals with 16 tokens. Given these low token numbers, results should be interpreted cautiously.
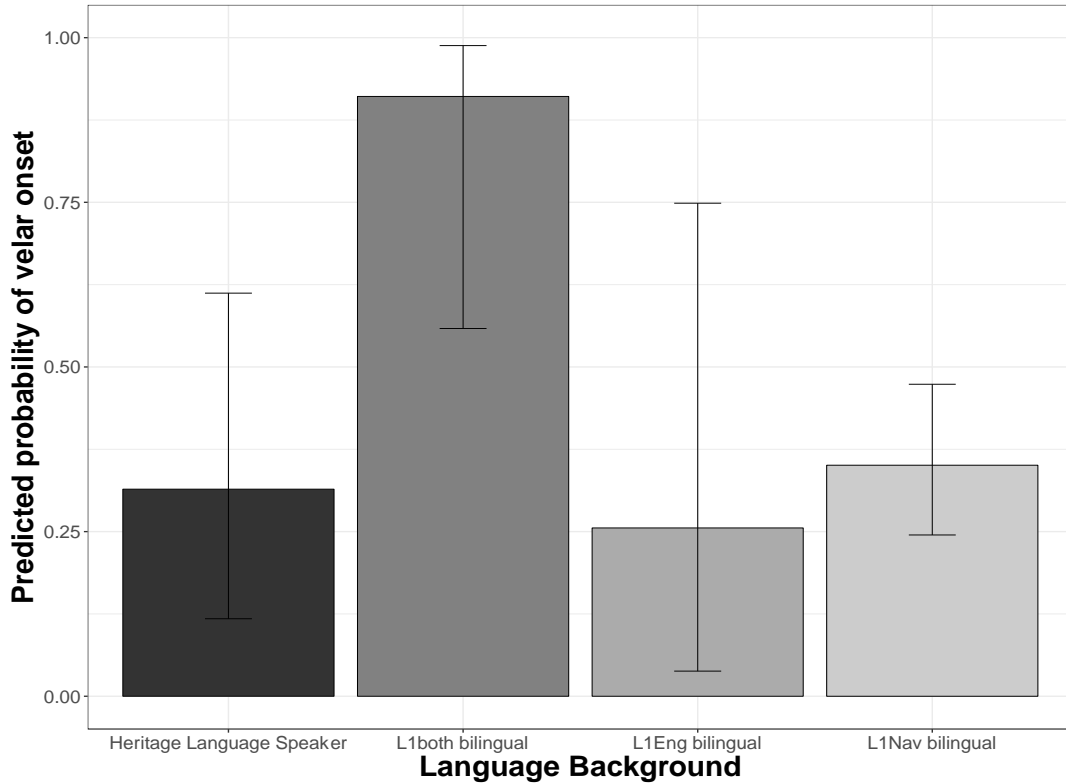
Figure 33. Probability of velar onset in ejective affricates by language background

Also included in the model were two significant linguistic predictors: AUDIBLE LATERAL and PHONETIC ENVIRONMENT. Output graphs for these factors are presented in the appendix. Speakers are predicted to favor velar onsets when there is no lateral release and word-initially.

5.6. Discussion

These results reveal incipient changes in the Diné affricates: $/\widehat{tl}/ > /kl/$ and $/\widehat{tl'}/ > /\widehat{kl'}/$. For the unaspirated affricates, though alveolar onsets still occur most often, the high frequency of velar onsets amongst young speakers suggests that $/\widehat{tl}/ > /kl/$ is a recent innovation. Results from an acoustic analysis of the unaspirated affricates show that while plain stops /t/ and /k/

are distinguished by VOT and spectral peak frequency, in the context of a lateral release these acoustic differences are less robust. There are non-significant spectral differences between [kl] and [tl] variants, but a high degree of variance and overlap remains. Outside of a few Navajo language teachers, who report that they attempt to correct [gl] pronunciations in their classrooms, this change remains below the level of awareness among these speakers. For the ejective affricates, variation between [t͡ɬ'] ~ [k͡ɬ'] is present among speakers of all ages, though velar onsets are more common among younger speakers and simultaneous bilinguals raised speaking both languages. Older speakers vary between alveolar and velar onsets, which are significantly differentiated in spectral peak frequency and VOT.

In terms of motivations for these changes, I propose that the variation in the ejective affricates among proficient speakers indicates that /k͡ɬ'/ is an earlier innovation that has arisen due to phonetic similarity between affricates with velar and alveolar onsets. At the same time, the /k͡ɬ'/ gap in the Diné inventory increases the likelihood of change due to what has been called language-specific perceptual assimilation (Blevins and Grawunder 2009). Under this view, variation introduced out of phonetic similarity can be tolerated because there is no contrastive /k͡ɬ'/ in the Diné inventory, and more variability is permitted because of an effect of top-down processing whereby speakers would perceive velar [k͡ɬ'] as /t͡ɬ'/ because it's the closest permissible phoneme. Even the acoustically distinct variants produced by the older speakers do not obscure any contrasts.

While phonetic and perceptual similarity motivate this change, the contact with English, which only allows word-initial clusters /gl/ and /kl/, is likely accelerating the change, evidenced by the strong preference for velar onsets among younger speakers. Especially in the case of the unaspirated segments, the strong correlation between age and velar onsets

points to externally-motivated convergent change. Due to increasing English usage in many domains of Diné life, younger speakers have less exposure to Diné bizaad and may be substituting English clusters for Diné phones as they categorize them as equivalent. The practice of borrowing Diné names containing /t͡ɬ'/ into English with /kl/ means that speakers have long been exposed to this conventionalized substitution.

In both proposed changes, younger speakers produce more tokens of the innovative velar onset variant in the observed data, evidence that they are the leaders of these changes, even the younger speakers who use Diné bizaad regularly. These speakers have had sufficient exposure to Diné bizaad to use the language comfortably and regularly, but they also have been exposed, and continue to be exposed, to a great deal of English input, which thus impacts their Diné pronunciation and results in some convergent changes. However, such changes are not necessarily due to partial acquisition or imperfect learning on the part of these younger bilinguals. The correlation between velar onsets and a higher exposure to English accounts for the strong preference amongst the simultaneous bilinguals for velar onsets, but it is surprising that we do not see similar effects amongst the heritage language speakers and L1 English sequential bilinguals, both groups that have similarly received a lot of English input. However, due to a highly imbalanced distribution of speakers among the bilingual language background levels, it remains impossible to tease apart the differences between language background and the highly correlated factor of age with this sample. The language background categories are also quite broad and an insufficient proxy for exposure to English over the course of a speaker's lifetime.

While the literature on second language acquisition and phonetics has proposed different criteria for measuring similarity in segments across languages, Babel (2009) raises

the question of how similar segments need to be to initiate transfer in minority languages experiencing significant language contact. The Diné unaspirated stops in particular share many phonetic characteristics with English /gl/: both have a voiced /l/, among younger speakers the spectral peak of /tl/ is further from that of /t/ than it is for older speakers, and the VOT of the onset of /tl/ closely resembles plain /k/ in both English and Diné bizaad. In the case of ejective affricates, there is an age-graded pattern whereby the silent portion of the release is decreasing, and some tokens (n=41) occur with a voiced lateral, making them more similar to English. Finally, both changes appear to be categorical substitutions in line with predictions of Babel 2009 presented in §1.3.2.1. However, without a clear acoustic correlate of place, or articulatory data, it is not possible to rule out change via approximation in these results.

5.7. Conclusions

To conclude, this chapter documented the phonetic characteristics of the Diné bizaad unaspirated and ejective laterally-released affricates and proposed incipient changes /t͡l/>/kl/ and /t͡ɬ'/ > /k͡ɬ'/. These changes are not stigmatized and for most speakers, remain below the level of awareness. The changes are argued to be motivated by phonetic similarity, language-specific perceptual assimilation, and expedited by intense contact with English. Results from the phonetic analyses validate that the lateral release obscures acoustic cues for place of articulation found in the plain segments, and because Diné bizaad has no phoneme /kl/, this change does not neutralize any meaningful contrasts. Statistical analysis further reveals that younger speakers are leading the changes, and in the case of the changes in the ejective affricates, variable patterns are present amongst the simultaneous bilinguals.

Chapter 6

Variation and Change in *nít'ę́ę́'*

6.1. Introduction

In this chapter I present an analysis of variation and change in the usage of the particle *nít'ę́ę́'*. Previous work on Diné bizaad describes the particle functioning as a contrastive conjunction, a temporal clause linker, and a marker of past time (Haile 1950; Reichard 1951; Young and Morgan 1987). In more recent research, scholars propose that *nít'ę́ę́'* has undergone grammaticalization from an adverb or conjunction to a past tense enclitic, while older functions remain with residual meaning in the language (Chee et al. 2004). In this chapter, I revisit this particle with an analysis of the synchronic functions in the personal narratives and pear film retellings. This chapter strives to:

    i.   describe the synchronic functions of *nít'ę́ę́'* in connected speech,

    ii.   analyze how linguistic and social factors condition any variation in usage,

    iii.   evaluate if the observed patterns are indicative of change,

    iv.   and propose a diachronic explanation to account for synchronic patterns of variation.

        This particle was selected as a variable due to the hypothesis that younger speakers might be moving towards an increased use of *nít'ę́ę́'* with verbs in the imperfective mode,

rather than perfective verbs, to convey past tense. An increase in analytical constructions is a change common to endangered languages (Dorian 1973), but this hypothesis is not borne out in these results, as younger speakers continue to produce perfective verbs at a rate consistent with speakers of other generations. Instead, I will show that in these contemporary stories, speakers of all ages use the particle *nít'ę́ę́'* most often as a past time marker and a discourse-level connective, especially linking sudden or surprising events. The particle is most frequent with verbs that convey a habitual past meaning in the imperfective, iterative, or usitative modes. There are no significant differences based on the investigated social factors of age, gender, and language background, though younger speakers do show some distinct patterns in their pronunciation and usage. Finally, a proposed analysis of polygrammaticalization is put forth to account for the present multi-functionality of the particle.

In the remainder of this chapter, I present background on *nít'ę́ę́'* (§6.2) and outline my methods for investigating the synchronic variation (§6.3). I then describe the synchronic functions of *nít'ę́ę́'* in these stories (§6.4) and discuss how the functions vary by different social factors (§6.5). In §6.6, I discuss the diachronic development of the particle and conclude in §6.7.

6.2. Previous descriptions of *nít'ę́ę́'*

Scholars have long described multiple functions and phonological realizations of *nít'ę́ę́'* with variants *ńt'ę́ę́', nít'éé, ńt'ę́ę́* (Haile 1950; Reichard 1951; Young and Morgan 1987). Throughout the descriptive literature on Diné bizaad, scholars consistently document three primary functions of the particle: a marker of past time, a conjunction or connective, and an adjectival marker translated as 'former' or 'deceased'. In these earlier descriptions, scholars

often cross-reference multiple entries for *nít'ę́ę́'* in a way that implies that this is the same particle performing different functions, but typically describe them separately without an overt discussion of semantic connections between the functions and without reference to how the particle developed.

In the few sources that do posit a diachronic source for *nít'ę́ę́'*, the consensus is that the particle developed from a verb. Haile (1950) proposes that *nít'ę́ę́'* comes from the perfective of the verb *'át'é* 'it is so' (Haile 1950: 122).[36] Willem de Reuse (p.c.) suggests that *nít'ę́ę́'* is a blend of the perfective stem *-'t'e'* (Young et al. 1992: 537) and the clitic *yę́ę* or *=ę́ę* (Young et al. 1992: 937). Likewise, McCreedy (1989) states that *nít'ę́ę́'* is morphologically the existential verb 'it was' (McCreedy 1989: 451). In order to explain the development of the different functions of the particle, Chee et al. (2004) propose an account of the grammaticalization of *nít'ę́ę́'* into a synchronic past tense marker. They cite the high frequency of past tense *nít'ę́ę́'* as evidence that Diné bizaad has developed a tense system, while other less frequent functions of *nít'ę́ę́'* reflect earlier functions of the particle.

6.2.1. Past Time *nít'ę́ę́'*

In early documentation of Diné bizaad, *nít'ę́ę́'* is analyzed as marking past time. For instance, in a dictionary published at the beginning of the twentieth-century, the Franciscan authors label the particle as a past tense auxiliary and list it—written as *nt'ǽ*—alongside entries for many verbs such as *sedá* (*nt'ǽ*) 'I sit' (Franciscan Fathers 1912). About these verbs they say: "this class of verbs often denote continuous or frequent action" (Franciscan Fathers 1912: 11).

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[36] I am grateful to Willem de Reuse for bringing this source to my attention and for sharing his perspective on the diachronic origins of *nít'ę́ę́'*.

More recent research has also addressed the past time function of *nít'ę́ę́'*. In his book on the Diné verb, Faltz (1998) states that *nít'ę́ę́'* is a past time marker used with verbs in the imperfective mode. Fernald and Perkins (2006: 22) remark that *nít'ę́ę́'* occurs frequently in a clause-final position, "to indicate that the proposition it expresses was true at some point in the past". Smith et al. (2007) propose that *ńt'ę́ę́'*, along with *=dą́ą́',* is an optional past tense morpheme (see example (21) for an example with *=dą́ą́'*). Since the Diné language does not require the grammatical expression of tense, the default temporal interpretation for verbs without these optional tense morphemes will vary depending on the discourse context and verbal mode: verbs in the progressive and imperfective modes typically convey present time, while verbs in the perfective mode are often interpreted as expressing past time (Smith et al. 2007).

When *nít'ę́ę́'* is used to mark past time, the particle may be interpreted differently depending on the mode of the co-occurring verb. Young and Morgan (1987) illustrate these variable interpretations in examples provided in (20), (21), (22), and (25). In these and all forthcoming examples, the particle is sometimes written as an independent word, and in others, as an attached enclitic. In the cited top lines of text, I reproduce exactly what was published in the source material. First, when *nít'ę́ę́'* occurs after an imperfective verb, it is typically translated 'was' or 'were', shown in example (20) with the imperfective verb *'ashhosh*.

(20) *'Ashhosh **ńt'éé'**.*
      'a–sh–hosh   nít'éé'
      THEMATIC–1SG–sleep.IPFV   PAST
      'I was asleep.'

                                                    (Young and Morgan 1987: 15)

With verbs in the iterative or usitative modes, the particle is translated 'used to'.[37]

Example (21) shows this usage with the iterative verb *ninádahałtį́į́h*.

(21) *'Ashkii nishłínę́ę́dą́ą́' 'ayóo ninádahałtį́į́h **ńt'éé'**.*
      'ashkii nish–łí=nę́ę́=dą́ą́'   'ayóo ni–nádaha–ł–tį́į́h   nít'éé'
      boy   1SG–be.IPFV=REL=PST   very   ITER–down.CLF–rain.ITER   PAST
      'It used to rain a lot when I was a boy.'

                                                              (Young and Morgan 1987: 15)

With perfective verbs, the particle is translated as a pluperfect 'had', as in example

(22) showing the perfective verb *nahóółtą́ą́*.

(22) *'Ayóo nahóółtą́ą́ **ńt'éé'** 'atiin hashtł'ish t'éiyá.*
      'ayóo nahóó–ł–tą́ą́   nít'éé' 'atiin hashtł'ish   t'éiyá
      very down–CLF–rain.PFV   PAST   road   mud   only
      'It had rained heavily, and the road was muddy.'

                                                              (Young and Morgan 1987: 15)

Regarding this past tense function, some sources further specify that *nít'ę́ę́'* conveys a

past condition that is no longer true (Reichard 1951; Smith 1991), or alternatively that *nít'ę́ę́'*

is used to express that an action was interrupted before it took place and does not require a

past tense interpretation (Haile 1926). For instance, the assumption in example (23) is that

people do not typically carry arrows as weapons any longer, while example (24) illustrates an

interrupted and unfulfilled action.

(23) *K'aa' t'éiyá ndajijaa **nt'éé'**.*
      k'aa' t'éiyá n–da–ji–jááh   nít'éé'
      arrow only   IPFV–DISTR–3a-move.plural.objects.IPFV   PAST
      'Arrows only they used to carry (as weapons).'

                                                              (Sapir and Hoijer 1967: 114)

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[37] The usitative and iterative modes are semantically very similar. Both refer to habitual events or regular
activities. The iterative tends to be used to describe events that occur at more set defined times, while the
usitative is used for events that typically occur in certain circumstances (Williams 2009: 171–2).

(24)   *'Adeshí **nít'ę́ę́'** nahałtxin.*[38]
        deesh–shih   nít'ę́ę́'   naha–ł–txin
        1SG.FUT–cut.FUT   PAST   down.space–CLF–IPFV.rain
        'I wanted to cut hay, but rain prevented me.'

<p style="text-align:right">(Haile 1926: 91)</p>

Related to this meaning of an unfulfilled action, the particle conveys a conditional

meaning when it occurs after a verb in the future mode. Example (25) shows this usage with

the verb *na'deeshnił*, conjugated in the future mode

(25)   *Shibéeso hólǫ́ǫ́dą́ą́' ła' na'deeshnił **ńt'éé'**.*
        shi–béeso   hó–lǫ́ǫ́=dą́ą́' ła' na'–deesh–nił   nít'éé'
        1SG–money   3–have.IPFV=PST some 2SG.for–1SG.FUT–give.FUT   CONDITIONAL
        'If I had any money I'd loan you some.'

<p style="text-align:right">(Young and Morgan 1987: 15)</p>

6.2.2. Conjunctive *nít'ę́ę́'*

In addition to its function as a past time marker, the particle is frequently described as a

conjunction translated 'when, but, and then' (Young and Morgan 1987: 678). As a conjunction

or connective, *nít'ę́ę́'* can occur between clauses or independently as an introductory particle

(Sapir and Hoijer 1942). Example (26) shows the particle in a clause-initial position

introducing subsequent action in a Coyote Story.

(26)   *Ńt'éé' gólizhii yii'woł.*[39]
        nít'éé'   gólizhii   yi–l–woł
        CONJ   skunk   3SG–CLF–run.PROG
        'Then skunk was running.'

<p style="text-align:right">(Sapir and Hoijer 1967: 118)</p>

Similar to the past time function, the conjunctive usage of *nít'ę́ę́'* is optional since Diné

bizaad does not require conjunctions: "the tendency of the language is towards placing a

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[38] This is typically written in contemporary Diné bizaad as <deeshshih> (Young and Morgan 1987: d789).
[39] This is typically written in contemporary Diné bizaad as <yilwoł> (Young and Morgan 1987: d792).

number of completed statements side by side, until a final predicate or phrase shows the connection" (Haile 1926: 100). Fernald and Perkins (2006) present a detailed discussion of Diné coordination and report that when *nít'ę́ę́'* is used as a clause linker, it tends to imply that, "the condition described in the first clause brought about the condition described in the second clause" (Fernald and Perkins 2006: 22). Elsewhere, the particle is described as conveying an adversative connotation expressing difference or contrariness. This interpretation is shown in example (27) where *nít'ę́ę́'* is translated as 'but' (Reichard 1951; Smith et al. 2007).

(27)　*Mą'įį yiłtsą́ nsin **ńt'ę́ę́** (or ndi) t'óó shił 'adzaa lá.*
　　　mą'įį　yi–ł–tsą́　　　　　nis–sin nít'ę́ę́'　　　t'óó shił 'ádzaa lá
　　　coyote 3OBJ–CLF–see.PFV　1SG–think.IPFV　　it.was.just.my.imagination
　　　'I thought I saw a coyote, but I just imagined it.'
　　　　　　　　　　　　　　　　　　　　　　　　　(Reichard 1951: 324)

In some cases, the conjunctive *nít'ę́ę́'* may carry a subordinating meaning as in example (28). In this example, *nít'ę́ę́'* is used to subordinate the clause *'áajį' naashá* to the main clause *naaki siiską́*.

(28)　*'Áajį' naashaa**ńt'éé'** naaki siiską́.*[40]
　　　'áajį'　naash–áa=nít'éé'　　naaki　sii–s–ką
　　　there　1SG–go.IPFV=CONJ　two　　1SG–PFV–stay.PFV
　　　'When I visited there, I stayed two days.'
　　　　　　　　　　　　　　　　　　　　　　　　　(Haile 1950: 123)[41]

At a discourse level, when Diné speakers use connective words such as *nít'ę́ę́'*, it has been proposed that they function to introduce a new topic or referent (Haile 1926). In this vein, McCreedy describes the discourse function of *nít'ę́ę́'* as a temporal conjunction that occurs episode-initially, post-peak transition or episode-internally. She adds that *nít'ę́ę́'* less

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[40] *'Áadi* would make more sense than *'áajį'* in contemporary Diné bizaad (Lorene Legah p.c.).
[41] Haile comments that perfective *níséyá* 'I went there (rt)' would be inappropriate here in place of *naashá nít'ę́ę́'*.

frequently marks verbs of action than another discourse marker *'áádóó* (McCreedy 1989). The particle may also serve a more general temporal sequencing function to show that one discourse event has been completed prior to the occurrence of the following action (Fernald and Perkins 2006).

Relatedly, the particle occurs within the construction *t'ah nít'ę́ę́'* 'suddenly' shown in example (29). This construction often occurs sentence-initially but is not restricted to a particular syntactic position.

(29) ***T'ah ńt'éé'*** *diné ńdadiibaa', hodoo'niid.*
      t'ah nít'éé'   diné   ń–da–dii–bah   ho–doo–d–niid
      suddenly   Navajo ITER–DISTR–INCEP–1PL–raid.ITER   3–oral–CLF–say.PFV
      'Suddenly it happened that the Navaho were starting to go on the war-path, it was said.'

                                                                (Sapir and Hoijer 1943: 338–9)

6.2.3. Adjectival *nít'ę́ę́'*

When occurring with a noun phrase, *nít'ę́ę́'* serves an adjectival function and is translated as 'past, former, deceased' to mark the name of a person who is no longer alive. This function is very frequent in early texts and consistently occurs after every mention of a deceased person or attached to the verb *wolyénít'ę́ę́'* 'he/she was called' (Sapir and Hoijer 1942).[42] Examples (30) and (31) show this function with *nít'ę́ę́'* occurring after the deceased family members: *shicheii* and *shizhé'é*.

(30) *Shicheii* ***nt'éé,***
      shi–cheii   nít'éé'
      1SG.POSS–maternal.grandfather   late
      'My late grandfather,'

                                                                (Haile 1926: 90)

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[42] This is typically written in contemporary Diné bizaad as <wolyéé nít'éé'> (Lorene Legah p.c.).

(31) *Shizhé'é **ńt'éé'** yeeshił halni' **ńt'éé'**.*

shi–zhé'é	nít'éé'	y–ee	sh–ił	ha–l–ni'	nít'éé'
1SG.POSS–father	late	it–about	me–with	3–CLF–3SG.tell.IPFV	PAST

'My father used to tell about it to me.'

(Sapir and Hoijer 1942: 340)

6.2.4. Distribution of *nít'ę́ę́'* in Texts

In addition to these grammatical descriptions, information about previous functions of *nít'ę́ę́'* can be amassed from its distribution in earlier texts: somewhat different usage patterns emerge for the particle in different discourse genres. In Coyote Stories and The Emergence Story, genres with relatively established sequences of events, there are many examples of sentence-initial *nít'ę́ę́'*, but few tokens of clause-final *nít'ę́ę́'*.[43] Example (32) comes from a recounting of The Emergence Story told in 1923 or 1924 by Sandoval, a Diné man from Shiprock, New Mexico. In this example, the speaker begins his sentence with *nít'ę́ę́'*, linking this sentence to earlier events in the story.

(32) *Nde' t'ado bik'izniyada djin.*

nít'ę́ę́'	t'áadoo	bi–k'i–z–ní–yá	da	da–ji–ní
then	NEG	it–on–3PFV–go.one.actor.PFV	NEG	DISTR–3a–say.IPFV

'Then she did not find where she came back again, they say.'

(Goddard 1933: 10)

Example (33) comes from a Coyote Story recorded in 1929 by Edward Sapir in Crystal, New Mexico. The speaker begins his sentence here with *nít'ę́ę́'* to transition to a dramatic moment of action in the story.

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[43] The sentence-initial use of *nít'ę́ę́'* in these narratives is also discussed in Chee et al. (2004).

(33) *Ńt'éé' jóhódah 'ahóółna' jiní.*
   nít'éé' jóhó da   'ahóó–ł–na'   ji–ní
   then unexpectedly 3.PFV–CLF–swallow.PFV 3a–say.IPFV
   'Then, unexpectedly, (coyote) swallowed (Horned Toad), they say.'

<div align="right">(Sapir and Hoijer 1942: 16–17)</div>

However, in personal narratives recorded around the same time, sentence-initial tokens of *nít'ę́ę́'* are much less common; instead *nít'ę́ę́'* tends to occur as a post-verbal marker of past time or as an adjective with names of deceased people.[44] The following examples (34–35) come from the narrative "A Navaho's Historical Reminiscences" recorded by Sapir in 1929 in Crystal, New Mexico and translated by Charlie Mitchell with the help of John Watchman (Sapir and Hoijer 1942: 337–397). Examples (34–35) show how speakers use *nít'ę́ę́'* to mark habitual past in the narrative. In (34) and (35), *nít'ę́ę́'* occurs at the end of each sentence directly after the verb.

(34) *Naakaii 'aadi shijéé' **ńt'éé.***
   naakaii   'aadi shi–jéé'   nít'éé'
   Mexicans   there PFV–3.be.PFV PAST
   'The Mexicans used to live over there.'

<div align="right">(Sapir and Hoijer 1942: 338)</div>

(35) *Diné ndaalnishgi neit'aash **ńt'éé'.***[45]
   diné na–da–l–nish=gi   na–iid–'aash   nít'éé'
   men   them–DISTR–CLF–work.IPFV=at them–1DU–DU.go.IPFV   PAST
   'As working men, we walked around.'

<div align="right">(Sapir and Hoijer 1942: 356)</div>

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[44] To quantify this more concretely, in the first 100 sentences of the narrative "A Navaho's Historical Reminiscences", there are only two tokens of a clause-initial *nít'ę́ę́'* translated as 'suddenly', 15 tokens of *nít'ę́ę́'* with names or *wolyénít'ę́ę́'* 'he used to be called', and 8 tokens with verbs describing past time, most of which refer to habitual past (Sapir and Hoijer 1942: 337–397).
[45] This is typically written in contemporary Diné bizaad as <nidaalnishgi> (Lorene Legah p.c.).

Example (36) shows one of the few uses of clause-initial *nít'ę́ę́'* in a personal narrative. This example describes a point of high drama in the narrative when a captured Diné woman is contemplating using a rock to attack her captor.

(36) *Ńt'ée' tsélei' nagháit'éégi sa'ą́.*
     nít'ée' tsé=lei'   nagháí   'át'é=gi   si–'ą́.
     then   rock=some   that.one   it.is=at   PFV−SRO.PFV
     'And then there was rock lying at that place.'

                                           (Sapir and Hoijer 1942: 334–335)

Attesting to how long this particle has exhibited phonological variation, in these texts, there are already examples of *nít'ę́ę́'* written as an enclitic attached to the verb. This suggests that a phonologically-reduced *nít'ę́ę́'* is not a new development, though as they are transcribed, the enclitic and the independent form are often indistinguishable and may merely reflect transcriber inconsistency. Example (37) shows how within a single sentence, *nít'ę́ę́'* is written both as a bound and independent form.

(37) *Shizhé'é **ńt'éé'** naakiiską́ą́go bizhéé'hodooleeł lágo,*
     shi–zhé'é   nít'éé' naaki yiską́ą́go bi–zéé'ho–dooleeł   lá=go
     1SG.POSS–father PAST   two   tomorrow 3SG.POSS–death–it.will.be MIR=SUB
     'My father, two nights before his death was to be',

     *hoghan sa'ą́ą́go binahjį' biłsékéé**ńt'éé'**.*
     hooghan si–'ą́=go   binahjį'   b–ił   si–ké=nít'éé'
     hogan   3.PFV–SRO.PFV=SUB   against.it   him–with 1SG.PFV–sit.two.actors.PFV=PST
     'I was sitting with him against the hogan that was there.'

                                           (Sapir and Hoijer 1942: 354-5)

6.3. Methods

In order to investigate the synchronic functions of *nít'ę́ę́',* I collected all clauses with tokens of *nít'ę́ę́'* from the pear film retellings (n=252) and personal narratives (n=199). I also

analyzed 1072 clauses from the personal narratives that have no *nít'ę́ę́'*, but clearly refer to past time based on the discourse context and translation. This allows for a comparison of similar discourse contexts, some which are marked with *nít'ę́ę́'* and some which are not. Throughout this analysis, I assume the presence of intonation units (IUs) as an identifiable unit of discourse. As a general definition, IUs are units of speech produced under a single prosodic contour, often offset by pauses or pitch reset (Chafe 1979). In the following examples from the interview corpus, each IU is written on a separate line.

Once collected, all the clauses were analyzed and annotated for the syntactic, morphological, and discourse factors displayed in table 19.[46] Clauses with *nít'ę́ę́'* were first annotated for POSITION and FUNCTION. In annotating POSITION, tokens were coded as post-verbal if they occur after the only verb in the intonation unit and inter-clausal if they occur between two clauses within a single intonation unit. Tokens were coded as IU-Final if they occurred at the end of the IU, but not after a verb. In line with the assumptions of the usage-based linguistic theories outlined in chapter 1, I assume that the semantic interpretation and grammatical function of a given construction are not static, and that the synchronic frequencies of different functions may reflect ongoing developments of the particle. I assign FUNCTION as the primary function to each usage of the particle based on the discourse context and the translations provided by Ms. Begay.[47]

Additionally, I annotated each clause with *nít'ę́ę́'* for FORM: segmental phonological realization of the *nít'ę́ę́'*, SUBJECT: if the subjects of the verbs before and after *nít'ę́ę́'* were

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[46] I also considered the presence of other temporal adverbs in the clause, time relative to previous verb, time relative to previous utterance, region of speaker, and sub-aspect: durative/punctual. These were not explanatory of the patterns in these data and therefore will not be discussed further.

[47] In cited examples from the stories, I mostly retain Ms. Begay's original translations and make only small changes for clarity.

the same or different, DURATION OF NITEE (ms), duration of any PAUSE BEFORE NITEE (ms), duration of any PAUSE AFTER NITEE (ms), NUMBER OF CLAUSES IN IU, DEPENDENT VERB: whether the verb is marked with subordinating morphemes, VERBAL MODE, and speaker factors including AGE, GENDER, and bilingual LANGUAGE BACKGROUND. When coding verbal mode, I annotated the mode of the verb occurring immediately before *nít'ę́ę́'* even in inter-clausal examples with two verbs.[48] With IU-Initial *nít'ę́ę́'*, I coded the mode of the first verb in the intonation unit. Since not all tokens of *nít'ę́ę́'* occur in a clause with a verb, the total number of annotations for dependent verbs and verbal mode does not match the total number of tokens of *nít'ę́ę́'* in table 19. Clauses without *nít'éé'* were annotated for: NUMBER OF CLAUSES IN IU, DEPENDENT VERB, VERBAL MODE, AGE, GENDER, and LANGUAGE BACKGROUND.

Finally, I also conducted a statistical analysis using binomial logistic regression in order to assess which factors best correlate with the presence of *nít'éé'* in past time narration. For the regression analysis, I used the *glmer* function with a logit link from the *lme4* package (Bates et al. 2015) in R (R Core Team 2017). Results from the statistical analysis will be presented in §6.5.2.

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[48] Inter-clausal tokens represent 2% of these data.

Table 19. Distribution of Annotated Categorical Factors

Category	Levels	Narrative total	Narrative *nít'ę́ę́'*	Pear Film *nít'ę́ę́'*
POSITION	Post-verbal	-	123	98
	IU-Final	-	7	11
	IU-Initial	-	30	63
	Own IU	-	21	42
	Inter-clausal	-	9	18
	Other	-	9	20
FUNCTION	Past time	-	128	90
	Sudden action	-	22	23
	Connective	-	40	135
	Adjective	-	1	2
	Other	-	8	2
DEPENDENT VERB	Yes	397	13	18
	No	1013	167	153
AGE	Younger	243	63	36
	Middle-Aged	591	71	133
	Older	435	65	83
GENDER	Woman	730	140	172
	Man	539	59	80
LANGUAGE BACKGROUND	L1 both bilingual	89	9	15
	Heritage language speaker	93	31	29
	L1 Diné bizaad bilingual	1040	149	193
	L1 English bilingual	47	10	15
FORM[49]	ndee	-	122	101
	nit'ee	-	33	26
	nee	-	28	73
	ahndee	-	11	41
	tahndee	-	2	0
	other	-	3	11
SUBJECT	Different	-	125	171
	Same	-	74	77
	NA	-	-	4
VERBAL MODE	Imperfective	605	107	45
	Perfective	637	54	79
	Iterative	73	13	0
	Progressive	72	4	39
	Unknown	18	1	5
	Other	7	1	0

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[49] For this category, I did not distinguish between variants that differ in tone and nasalization.

6.4. Results

I now turn to an overview of the synchronic usage of *nít'ę́ę́'* in the corpus. Overall, tokens of *nít'ę́ę́'* occur in only around 5% of intonation units in these data. Most tokens of *nít'ę́ę́'* occur post-verbally or in an IU-Initial position, and the position of *nít'ę́ę́'* is very closely tied to its function: IU-Initial or Own IU *nít'ę́ę́'* tends to be a connective, while post-verbal *nít'ę́ę́'* tends to mark past time. Table 20 shows the distribution of *nít'ę́ę́'* by position.

Table 20. Distribution of Position of *nít'ę́ę́'*

Position	n	Percentage
Post-verbal[50]	221	49%
IU-Initial	93	21%
Own IU	63	14%
Inter-clausal	27	6%
IU-Final	18	4%
Other	29	6%
Total	451	100%

6.4.1. Post-verbal *nít'ę́ę́'*

As shown in table 20, *nít'ę́ę́'* most often occurs immediately after the verb annotated as post-verbal. Since word order in Diné bizaad tends to be SOV, this usually coincides with IU-Final position as well. In this position, 56% (124) of tokens occur after imperfective verbs, 27% (60) after perfectives, 13% (29) after progressives, and 6% (13) after iterative verbs. In this position, *nít'ę́ę́'* occurs after dependent verbs in only 5% (12) of cases. In terms of pronunciation, most tokens of post-verbal *nít'ę́ę́'* are phonologically reduced: 57% (126)

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[50] These 221 tokens of the particle occur with 72 different verb types.

tokens of post-verbal *nít'ę́ę́'* are pronounced /ndę́ę́/, 26% (57) tokens are pronounced /nę́ę́/,

and 14% (30) are pronounced /nit'ę́ę́'/. In line with the earlier findings of Chee et al. (2004),

as an enclitic, *nít'ę́ę́'* occurs outside the negative marker *doo...da*. [51]

Based on the discourse context and provided translations, the most common function

of post-verbal *nít'ę́ę́'* is to indicate past time, especially habitual past, translated 'used to'. In

the narratives, 44% of clauses with post-verbal *nít'ę́ę́'* are translated this way, and an

additional 36% of clauses have a meaning compatible with habitual past. Almost all of the

verbs interpreted as habitual past occur in the imperfective or iterative modes. Examples (38–

42) illustrate how speakers convey a habitual past meaning in their stories with and without

the use of *nít'ę́ę́'*. First, in example (38) Jennie Haag describes how when she was younger,

she worked in Ganado but is now retired and living in Flagstaff.

(38)   *Ganadodi naashnish **ndéé'** 'éí 'áádi.*
       Ganado=di   naash–nish   nít'ę́ę́'   'éí   'áadi
       Ganado=at   1SG–work.IPFV   PAST   DEM   there
       'I used to work at Ganado over there,'
                                                       (18106-19 Jennie Haag Interview 00:21:17.670)

Next, in example (39) Kendralyn Begay recounts how she used to plant corn during

the summers she spent with her grandparents as a child.

(39)   *Kéédadiidlééh **nídę́ę́'** naadą́ą́.*
       kéé–da–dii–dlééh   nít'ę́ę́'   naadą́ą́
       THEM–DISTR–1PL–plant.IPFV   PAST   corn
       'We used to plant corn.'
                                                       (18106-05 Kendralyn Begay Interview 00:22:00.831)

Example (40) comes from a story where Michelle Lee is talking about how she used

to go on enjoyable hikes with her grandmother when she was younger.

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[51] But see a counterexample from an earlier source: ***doo t'áá biidisghįńt'éé' da** '*he was not allowed to remain killed' (Haile 1950: 122).

(40)   *Wáhádzo shił yá'át'ééh łeh **nę́ę́'**.*
wáhádzoo sh–ił   yá'á–t'ééh   łeh   nít'ę́ę́'
extremely 1SG–with   3SG–be.good.IPFV   usually   PAST
'I used to like it a lot.'

(18106-32 Michelle Lee Interview 00:16:05.700)

Example (41) shows a habitual past example without an overt 'used to' translation, as Cathy Smith talks about how her mother would take care of her and her siblings when they were growing up.

(41)   *Nihaa 'áhályą́ą́ **ndę́ę́'**.*
nihaa   'á–ho–l–yą́   nít'ę́ę́'
1OBJ.PL   THEMATIC–3a–CLF–care.for.IPFV   PAST
'She took care of us.'

(18106-33 Cathy Smith Interview 00:26:55.041)

Less common, are examples of a stative perfective with a habitual past interpretation. This construction is exemplified in (42) where Peggy Manygoats is describing how she and her siblings used to sit and wait for their mother to come home when they were children.

(42)   *Biba' nahísíitą́ą łeh **néé'**.*
bi–ba'   nahí–síí–tą́   łeh   nít'ę́ę́'
her–for   around–1PL–3or.more.sit.PFV   usually   PAST
'We used to sit waiting for her.'

(18106-14 Peggy Manygoats Interview 00:17:24.265)

There are also a few examples of speakers using a post-verbal *nít'ę́ę́'* with a perfective verb in a context that is not compatible with a habitual past interpretation but instead describes a single past event. Though not translated this way, a pluperfect reading, like that described in Young and Morgan (1987) would be possible in some, but not all of these cases. Like data described in Chee et al. (2004), many of these examples could be interpreted as marking a sudden change or surprising action. For instance, in example (43) Alvanna Yazzie is talking

133

about a dog coming to kill her cat, a dramatic and sad moment in her story about a cat she had when she was younger.

(43) *Nihighandi níjéé' **nít'ę́ę́'** shimásí yázhí,*
      nihi–ghan=di   ní–jéé'   nít'ę́ę́' shi–másí   yázhí
      1PL.POSS–house=at   3.PFV–3PL.come.PFV   PAST   1SG.POSS–cat small
      'It (a dog) came to our house, my small cat,'

      déísxį́.
      da–yii–s–xį́
      DISTR–3OBJ–PFV–kill.PFV
      'it (the dog) killed it (the cat).'
                                (18106-07 Alvanna Yazzie Interview 00:22:23.196)

Similarly, in example (44) Joan Cooley uses *nít'ę́ę́'* to describe the moment when a police officer passes her and then suddenly turns around to follow her one time when she was driving.

(44) *'Áádóó*
      'áádóó
      and.then
      'And then,'

      *kǫ́ǫ́ shííghah bił dah diilwod **nídę́ę́'***
      kǫ́ǫ́   shíi–ghah   b–ił   dah   dii–l–wod   nít'ę́ę́'
      here   1SG–beside   3–with set.off INCEP–CLF–go.PFV   PAST
      'here he passed by me,'

      shich'į' bił naaná'áswod
      shi–ch'į'   b–ił   naaná–s–wod
      1SG–toward   3–with   around–3PFV–go.PFV
      'he turned around after me.'
                             (18106-35 Joan Cooley Interview 00:14:13.110)

In the pear film retellings, where a habitual past interpretation is not expected, when post-verbal *nít'ę́ę́'* occurs with an imperfective or progressive verb, it tends to be translated with 'was' or 'were'. Examples (45) and (46) show the usage of post-verbal *nít'ę́ę́'* in the pear

film retellings. In example (45), Eddie Begaye uses *nít'ę́ę́'* with the verb *sizį́* to describe the action of a boy's friends who were waiting for him, while he returned a hat to another boy.

(45) *Hak'is naaki t'áá haba' sizį́į́néé' 'éíyá 'éí 'áájí,*
 ha–k'is   naaki t'áá ha–ba' si–zį́=nít'ę́ę́'   'éíyá   'éí   'áájí
 3.POSS–friend two   just him–for 3.PFV–sit.PFV=PAST only   DEM   there
 'His friends, two of them, were waiting for him over there,'

 baazhníníl 'áko.
 b–aa–ji–ní–níl   'áko
 3–to–3a–PFV–give.plural.objects.PFV   so
 'so he gave pears to them.'
                                  (18106-03 Eddie Begaye Interview 00:16:35.260)

In example (46), Vincent Werito describes a scene in the film where a boy is biking along in a quiet field, when a girl suddenly appears and passes him. Mr. Werito uses *nít'ę́ę́'* after the verb *'iilwoł* to describe the action prior to the abrupt appearance of a new character.

(46) *'Áádóó 'atiino bił 'iilwoł ndę́ę́'.*
 'áádóó   'atiin=góó   b–ił   'ool–woł   nít'ę́ę́'
 and.then road=on 3–with   3–drive.PROG   PAST
 'And then he was driving it on the road.'

 Bidináo 'at'ééd.
 bidinínáajigo   'at'ééd
 in.the.opposite.direction.from   girl
 'A girl passed him.'
                                  (18106-26 Vincent Werito Interview 00:26:24.176)

In the pear film retellings, post-verbal *nít'ę́ę́'* occurs more frequently with perfective verbs than in the personal narratives. This use of *nít'ę́ę́'* with a perfective verb is sometimes translated as a pluperfect 'had' such as in example (47) when Valerie Tapaha talks about how in the film, the boy's hat had blown off when he turned his head to look back at the girl. Here, the verb *bik'ééyol* is in the perfective mode and followed by *nít'ę́ę́'*.

(47) *'Áá bich'ah bik'ééyol **néé'***
     'áá   bi–ch'ah   bi–k'i–yol   nít'ę́ę́'
     just   3.POSS–hat   it–off–blow.off.PFV   PAST
     'His hat had blown off,'

     t'ą́ą́' ńdéest'į́į'o.
     t'ą́ą́'   ń–dí–ees–t'į́į'=go
     backwards   returning.back–sight–3–look.IPFV=SUB
     'when he looked back.'

                                    (18106-17 Valerie Tapaha Interview 00:14:55.095)

6.4.2. Intonation Unit-Initial *nít'ę́ę́'*

The second most frequent position for *nít'ę́ę́'* is at the beginning of intonation units. In both

the pear film retellings and the personal narratives, *nít'ę́ę́'* tends to function as a temporal

linker in this position used to express an adversative meaning translated as 'but then', sudden

sequential action, or to mark an important part of the story (Webster 2011). In this position

nít'ę́ę́' introduces a clause with a different subject from the prior clause 76% of the time, one

indication of a shift in narrated topic or event. The most common phonological forms in this

position are the phonologically reduced /ndę́ę́'/ and /nę́ę́'/.

     Unlike post-verbal *nít'ę́ę́'*, in IU-Initial position, the particle is associated with sudden

rather than habitual action. IU-Initial *nít'ę́ę́'* tends to occur in clauses describing one event in

the past or sequential, seemingly unexpected action, which occurs periodically in the events

of the pear film. Accordingly, *nít'ę́ę́'* introduces more clauses with perfective verbs in this

position (n=43) than in the post-verbal position (n=60). In contrast to McCreedy (1989), who

reports that *nít'ę́ę́'* occurs less frequently with action verbs, in these data, narrators often use

nít'ę́ę́' to introduce clauses with verbs of action. For instance, in example (48) Vincent Werito

is describing the birth of his son and introduces the clause describing the moment his wife

goes into labor with an IU-Initial *nít'ę́ę́'* translated 'but then'. In the first clause, Mr. Werito

136

also uses a post-verbal *nít'ę́ę́'* to mark the verb *sidá* describing the state of his wife sitting

prior to beginning to labor.

(48)   *Sidáá **ndéé'** 'áadi ch'íníyáá dóó,*
        si–dá   nít'ę́ę́'   'áadi   ch'í–ní–yá   dóó
        3–sit.PFV   then   there   out–PFV–3.go.PFV   and
        'She was sitting and then when she came out and,'

        t'áá t'áá yich'į' yigáało,
        t'áá   t'áá   yi–ch'į'   yi–gáał=go
        just   just   3–towards   3–walk.PROG=SUB
        'just as she was walking to it,'

        ndéé *shį́į́ yee'o shį́į́ 'awéé' bi'dii'na' 'áádóó 'áá kǫ́ǫ́ t'óó.*
        nít'ę́ę́'   shį́į́   yee'=go   shį́į́   'awéé' bi'dii'–na'   'áádóó t'áá kǫ́ǫ́ t'óó
        then   perhaps really=ADV   perhaps baby   against.it–rub.PFV then   here
        'but then I guess very hard the baby started to come.'

                                         (18106-26 Vincent Werito Interview 00:31:06.325).

In example (49) from a pear film retelling, Sylvia Jackson uses *nít'ę́ę́'* to introduce a

clause describing the unexpected, unintended action of the farmer dropping a pear as he is

picking fruit from a tree.

(49)   *'Ákoshį́į́ 'éí shį́į́ yínizh,*
        'ákoshį́į́   'éí   shį́į́   yí–nizh
         so   DEM   perhaps   3–pick.PFV
        'So then he is picking pears,'

        nít'ę́ę́' *shił ła' bits'ą́ą́' naałts'id.*
        nít'ę́ę́' sh–ił   ła'   bi–ts'ą́ą́'   naa–ł–ts'id
        then   1SG–with   one   him–from   around–CLF–PFV–fall.PFV
        'but then one had fallen from him.'
                                   (18106-01 Sylvia Jackson Interview 00:27:42.828)

Another common occurrence of IU-Initial *nít'ę́ę́'* is in the construction *t'ah nít'ę́ę́'*

translated 'all of a sudden' and often phonologically reduced. Examples (50) and (51) show

clauses from a story told by May Stevens (pseudonym) and a pear film retelling from Lemuel

Harvey respectively. Both clauses begin with *t'ah nít'ę́ę́'* introducing the next action or change of state.

(50)   ***T'ah nídę́ę́*** *hodíína'* ***nídę́ę́*** *chidí háácha.*
          t'ah nít'ę́ę́'   hodíína'   nít'ę́ę́' chidí   há–cha
          suddenly   later   then   car   3.INCEP–cry.PFV
          'All of a sudden later the vehicle started to honk.'

                                                  (May Stevens unarchived)

(51)   ***'Ah nę́ę́'*** *t'áá naakíhí.*
          t'ah nít'ę́ę́'   t'áá   naakí=hí
          suddenly   just   two=aforementioned
          'Suddenly there were only two (baskets).'

                              (18106-13 Lemuel Harvey Interview 00:15:20.162)

6.4.3. *Nít'ę́ę́'* as an Intonation Unit

Similar to the functions of IU-Initial *nít'ę́ę́'*, when *nít'ę́ę́'* occurs as its own intonation unit, it tends to mark temporal sequence or introduce sudden action. Tokens of *nít'ę́ę́'* in this position are more common in pear film retellings than in the personal narratives. Example (52) comes from Sylvia Jackson's pear film retelling describing the scene at the beginning of her story. She states that the scene is morning in the first intonation unit, produces an intonation unit with just *nít'ę́ę́'* in the second intonation unit, and then in the third intonation unit describes the sudden crowing of a chicken off-screen accompanied by the appearance of a man.

(52)   *’Abíní jiní,*
        ’abíní   ji–ní
        morning   3a–say.IPFV
        ‘It was morning, it was said,’

        nít’ę́ę́’,
        then
        ‘but then,’

        na’hóóhai,
        chicken
        ‘a chicken,’

        er er er yiists’ą́ą́’ ’áádóó hastiin,
            yi–s–ts’ą́ą́’   ’áádóó   hastiin,
            THEMATIC–PFV–make.noise.PFV   and.then   man
        ‘er er er it made a noise, and then a man,’

                                    (18106-01 Sylvia Jackson Interview 00:27:05.816)

6.4.4. Inter-clausal *nít’ę́ę́’*

As shown in examples (53–55), in a small percentage of tokens (6%), speakers produce two

sequential clauses joined with *nít’ę́ę́’* within a single intonation unit. Tokens of *nít’ę́ę́’* tend to

be pronounced as /ndee/ or /nee/ in this position. The narrators may be structuring their

discourse in this way in order to present the clauses as a unified event or two connected

actions, a finding consistent with research on intonation units in other languages (Chafe 1987).

It remains unclear exactly what *nít’ę́ę́’* contributes to these intonation units, though unlike

earlier findings in Fernald and Perkins 2006, these examples do not uniformly convey the

meaning that the event in the first clause causes the event in the second clause. Given the

functions noted above, speakers may be using *nít’ę́ę́’* to convey a change in state or surprising

action within the event.

139

(53) *Dzi'ízí bił yilwoł **néé'** 'at'ééd yinéił'į́į' 'at'ééd*
dzi'ízí b–ił   yi–l–woł   nít'ę́ę́'   'at'ééd yinéi–ł'į́į'   'at'ééd
bike   3–with 3–CLF–ride.PROG   CONJ   girl   3.PFV–look.at.it.PFV   girl
'(He was) riding the bike, but he looked at the girl.'

<div align="right">(18106-01 Sylvia Jackson Interview 00:30:20.914)</div>

(54) *'Áá shiyáázh dego háághal **né'** óó siláo bich'į' sizį́.*
t'áá shi–yáázh   dego háá–ghal   nít'ę́ę́' t'óó siláo bi–ch'į'   si–zį́
    1SG.POSS–son up   3–look.PFV CONJ   just cop   him–towards PFV–stand.PFV
'My son looked up, and the cop was standing towards him.'

<div align="right">(18106-35 Joan Cooley Interview 00:14:48.530)</div>

(55) *'Atiin góyaa yikah **néé'** hach'ah ńdeidii'ą́.*
'atiin   góyaa   yi–kah   nít'ę́ę́'   ha–ch'ah
road   down   PROG–3.go.PROG   CONJ   his–hat

na–da–yi–di–yi–'ą́
up–DISTR–3OBJ–INCEP–transitional–pick.up.SRO.PFV
'They were walking down the road, and they picked up his hat.'

<div align="right">(18106-36 Elsie Whitehorse Walck Interview 00:19:47.803)</div>

6.4.5. Other Functions of *nít'ę́ę́'*

In the earlier literature on *nít'ę́ę́'*, scholars discuss its use as a past time adjective 'former,

deceased'. Indeed, this use is very frequent in the narratives transcribed in Sapir and Hoijer

1942. This function was not frequent in these narratives; instead speakers use the clitic *=yę́ę*

to indicate 'late' or 'deceased'. Peggy Manygoats exemplifies this usage in example (56) from

her personal narrative. She uses *=yę́ę* with her late father's name at the beginning of the clause.

(56) *Shizhé'é**yę́ę** hwít'ao díí 'át'ao íníł'į́į dóó díí t'ao 'ájiił'įįh nǫǫ.*
shi–zhé'é=yę́ę   hwít'é=go   díí   'át'é=go   'í–ní–ł'į́į
1SG.POSS–father=late like.this=SUB   this   it.is=SUB   THEM–you.CLF.do.USIT

dóó   díí   'át'é=go   'á–ji–ł–'įįh   ní=go
and   this   it.is=SUB   THEM–3a–CLF–do.USIT   3.say.IPFV=SUB
'My late father, "like this, this is how you do it," he would say.'

<div align="right">(18106-14 Peggy Manygoats Interview 00:19:43.825)</div>

In example (57) Eugene Yazzie (pseudonym) uses *nít'ę́ę́'* in his story to refer to a house that no longer exists.

(57)　*'Éí hoowan **ndéé** k'ad 'éí t'óó béé bighan t'éiyá si'ą́.*
　　　'éí　hooghan　nít'ę́ę́'　k'ad 'éí　t'óó dibé　bi–ghan　　t'éiyá si–'ą́
　　　DEM house　　former now DEM just sheep 3.POSS–house only　PFV–SRO.sit.PFV
　　　'That used to be a house, now it is just a sheep corral sitting there.'

(Eugene Yazzie unarchived)

6.4.6. Summary of Synchronic Functions

As exemplified above, and matching earlier descriptions in the literature, speakers use *nít'ę́ę́'* most frequently to indicate past time, especially habitual past. In these data, narrators also use post-verbal *nít'ę́ę́'* with some non-stative perfective verbs to mark specific moments in their stories. In its second most pervasive function, speakers use *nít'ę́ę́'* as a discourse connective, often linking speech events that are construed as different, adversative, or sudden.

As a discourse-connective, *nít'ę́ę́'* is associated with newness or highlighted events (Webster 2011), something which is evident when we consider where in the pear film retellings speakers are using *nít'ę́ę́'*. Tokens of *nít'ę́ę́'* across speakers occur most often in clauses describing moments when new characters arrive or leave a scene. Speakers also tend to not use *nít'ę́ę́'* with dependent verbs. Since dependent verbs in Diné bizaad often convey backgrounded information in discourse (Mithun 2008), they would be less likely to include sudden or new information that progresses the narrative and therefore are less likely to co-occur with *nít'ę́ę́'*. Overall, this discourse-usage of *nít'ę́ę́'* may serve as a counterpart to another prominent discourse linker *'áádóó* 'and then', which has been described as marking temporal cohesion between discourse events (Archuleta et al. 2006). When compared with

141

descriptions in the earlier literature and the usage in earlier texts, the adjectival usage of *nít'ę́ę́'*

has largely been replaced by *=yę́ę*.

6.5. Variation and *nít'ę́ę́'*

Having provided an overview of the synchronic functions of *nít'ę́ę́'*, I now present a brief

discussion of how speakers vary in their use of *nít'ę́ę́'*. I first consider patterns in the

distribution of *nít'ę́ę́'* by social factors: age group, gender, and language background. I then

present results from a statistical analysis, in which I find no significant patterns based on the

considered social factors, though the results from the statistical model do confirm the

relevance of the linguistic factors described in §6.4.

6.5.1. Distribution of *nít'ę́ę́'* by Social Factor

Though no social patterns reach statistical significance in the model, speakers of different age

groups show some notable distributional patterns in their use of *nít'ę́ę́'* based on observed

frequencies. In these data, younger speakers use *nít'ę́ę́'* more frequently with past time verbs

than speakers of other age groups: younger speakers mark 25% (n=243) of their past tense

clauses with *nít'ę́ę́'*, while middle-aged speakers mark 12% (n=593), and older speakers 15%

(n=435). Relatedly, speakers of different age groups show slightly different patterns in the

position of *nít'ę́ę́'*. Table 21 shows the distribution of *nít'ę́ę́'* in the personal narratives and

pear film retellings. Tokens are presented by position organized by age group. These results

show that speakers of all ages have the highest percentage of post-verbal tokens of *nít'ę́ę́'*,

and younger speakers have a lower percentage of IU-Initial tokens (9%) than middle-aged

(29%) or older speakers (23%).

Table 21. Use of *nít'ę́ę́'* by Position and Age Group

Position	Younger	Middle-Aged	Older
Post-verbal	61 (62%)	86 (42%)	75 (50%)
IU-Initial	9 (9%)	60 (29%)	34 (23%)
Own IU	14 (14%)	28 (14%)	12 (8%)
Inter-clausal	3 (3%)	15 (7%)	8 (5%)
IU-Final	8 (8%)	5 (2%)	4 (3%)
Other	4 (4%)	10 (5%)	16 (11%)
	n=99	n=204	n=149

As mentioned in §6.1, I had initially hypothesized that the frequency of *nít'ę́ę́'* may increase as younger speakers used fewer verbs in the perfective mode to mark events in past time. However, the percentage of perfective verbs is very stable across age groups. Heritage language speakers and younger speakers do have a higher percentage of post-verbal *nít'ę́ę́'* than speakers of other age groups and language backgrounds; the post-verbal position is the most frequent and could be a more salient position for speakers who use the language less.

Younger speakers also show some pronunciation distinctions in their particle usage. Younger speakers pronounce *nít'ę́ę́'* with a longer duration than other speakers and are more likely to realize *nít'ę́ę́'* as [nít'ę:] rather than a reduced variant. This difference could be attributed to effects of hyper-articulation among younger speakers, who use the language less frequently, or could reflect the influence from Diné bizaad literacy.[52] Many of the younger participants have studied Diné bizaad in an academic setting and have had more exposure to Diné literacy than older speakers. The particle is represented orthographically as <nít'éé'>.

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[52] Thank you to the audience at the 2018 Dene Language Conference and to Melvatha Chee for helpful discussion on this point.

6.5.2. Statistical Analysis of Variability in *nít'ę́ę́'*

In order to identify any significant patterns conditioned by social and linguistic factors, I fit a mixed-effects logistic regression model to the presence or absence of *nít'ę́ę́'* as a dependent variable using the *lme4* package in R (Bates et al. 2015). The maximal model included AGE GROUP, GENDER, LANGUAGE BACKGROUND, VERBAL MODE, and DEPENDENT VERB and a random effect of SPEAKER. After following the same backwards model selection process described in earlier chapters, the final model includes only VERBAL MODE and DEPENDENT VERB as significant fixed effects and SPEAKER as a random effect adjustment to the intercept. All social factors were removed during the model selection process. The output from the model is presented in the appendix. This model (*mR² = 23%; cR² = 41%*) confirms that *nít'ę́ę́'* is more likely to occur with verbs in the imperfective, usitative, or iterative modes, as well as with non-dependent verbs.

6.5.3. Summary of Variation in *nít'ę́ę́'*

There is substantial variability between speakers in how frequently they use *nít'ę́ę́'*, though this variability does not seem to closely correlate with the considered social factors in a way that suggests that *nít'ę́ę́'* marks social meaning. On one hand, some speakers such as Leroy Morgan, recount personal narratives describing habitual past events from childhood, but have very few tokens of *nít'ę́ę́'*. On the other hand, speakers like Cathy Smith, similarly talk about their childhoods and mark almost every intonation unit with *nít'ę́ę́'*. These differences may arise due to stylistic variation in how speakers tell stories but remain unexplained based on these data. These results show that among these speakers *nít'ę́ę́'* is most common with non-dependent verbs in the imperfective, usitative, or iterative modes.

6.6. Posited Diachronic Explanations

Based on the earlier descriptions presented in §6.2, speakers have likely been using *nít'ę́ę́'* for multiple functions and with sub-phonemic variation since at least the 1930s. While the distribution of multiple functions in early texts indicates that these functions are not new, their frequencies seem to have shifted over time. As represented in these stories, the adjectival function of *nít'ę́ę́'* has fallen out of use, while speakers continue to use the clause-initial connective *nít'ę́ę́'* and the post-verbal past time *nít'ę́ę́'*.

Given the range of observed synchronic functions, the distinct meanings of *nít'ę́ę́'* in different constructions are consistent with a diachronic analysis of polygrammaticalization. Grammaticalization, as outlined in chapter 1, is when a lexical item develops into a grammatical marker, or when a grammatical marker becomes more grammatical (Hopper and Traugott 2003). Relatedly, polygrammaticalization is when a lexical item develops distinct grammatical functions in different domains (Craig 1991). Research on patterns of grammaticalization identifies commonly attested pathways found across languages, and typically, as a marker becomes more grammatical and less lexical, there are accompanying changes such as phonological reduction, semantic generalization, and pragmatic extension (Bybee et al. 1994). However, even as an item develops an increasingly grammatical and abstract function, older, residual meanings often remain in the language. Though grammaticalization, like any kind of language change, is most clearly observed with a lengthy record of detailed longitudinal data, evidence of ongoing or prior grammaticalization can also be discussed in light of synchronic patterns of variation.

If the source of *nít'ę́ę́'* is the aforementioned perfective form of *'át'é*, perhaps a blend with *=yę́ę*, then polygrammaticalization could account for the development of this verb into

the distinct grammatical meanings shown in figure 34. In §6.6.1 and §6.6.2 I discuss the possible grammatical development of *nít'ę́ę́'* into its two most frequent current functions: a past time enclitic within the verb phrase and a discourse-level connective. These sections reflect my account of the most plausible diachronic developments of *nít'ę́ę́'* based on the synchronic data and the available diachronic record; the proposed explanations should be taken as hypotheses rather than definitive arguments.

Source	Domain		Syntactic Status	Meaning
	Noun Phrase		Enclitic	'former'
nít'ę́ę́'	Verb Phrase	→	Enclitic	'used to, was'
'it was'	Sentence		Conjunction	'but'
	Discourse		Discourse Connective	'but then, suddenly'

Figure 34. Possible Polygrammaticalization Outcomes of *nít'ę́ę́'*

6.6.1. Diachronic Development of *nít'ę́ę́'* as a Past Time Marker

If the source for *nít'ę́ę́'* is a blend of the perfective existential verb 'it was' and the clitic *=yę́ę* 'aforementioned, former' (Young and Morgan 1987: 21), then the verb *nít'ę́ę́'* appears to have undergone decategorialization and lost some verbal qualities (cf. Hopper and Traugott 2003). Though there are still constructions where *nít'ę́ę́'* functions as the main predicate, its use is restricted to a third person singular subject. Furthermore, these constructions are rare and *nít'ę́ę́'* much more frequently co-occurs with a main verb, an indication of a loss of lexical independence, with an increase in grammatical or pragmatic meaning related to the main verb in the clause. In contrast, the related neuter imperfective stem *-t'é* 'to be (qualitatively)' has a present tense interpretation and is still a frequent and productive verb in the language (Young and Morgan 1987: 119).

The grammaticalization literature on the development of tense markers discusses several different pathways for markers of simple past. One such pathway is for the verb 'to be' to develop a resultative meaning that is then extended to an anterior meaning, and finally into a simple past or perfective (Bybee et al. 1994). This is the pathway tentatively proposed for *nít'ę́ę́'* by Chee et al. (2004). Alternately, perfective verbs have been reported to develop into past time auxiliaries (Heine 1993: 67). Though *nít'ę́ę́'* does function as a past time marker, its use is more restricted than simple past; instead the particle typically indicates habitual past or action that is sudden or surprising. Most past time verbs are not marked with *nít'ę́ę́'*, but instead the particle is optionally employed by speakers to convey a particular pragmatic meaning rather than a required grammatical past tense.

I propose that the past time grammatical interpretation of *nít'ę́ę́'* could have developed as speakers initially combined *nít'ę́ę́'* with neuter stative verbs which are only conjugated in one mode: perfective, imperfective, or progressive (Young and Morgan 1987: 189; Smith 1991: 422). Earlier literature describes how speakers would add *nít'ę́ę́'*, which functions like a past-time auxiliary, to convey past time with verbs like the perfective neuter *sédá* 'I am seated' (Franciscan Fathers 1912). From there, speakers may have extended the usage of *nít'ę́ę́'* to habitual statives, verbs conjugated in the usitative or iterative modes (Smith 1991), and finally to active verbs. Evidence for this layered progression is found in the synchronic frequencies; contemporary participants still use *nít'ę́ę́'* much more often with statives and habitual past verbs. As speakers used *nít'ę́ę́'* more frequently as a past time marker after main verbs, the particle appears to have undergone phonological reduction to forms like /ndéé/, and cliticization, often phonologically attaching to the main verbal predicate.

6.6.2 Diachronic Development of *nít'ę́ę́'* as a Discourse Connective

The development of *nít'ę́ę́'* as a discourse connective remains more speculative. One possibility is that this connective function arose first as a clause linker which has then been extended to discourse. In these stories *nít'ę́ę́'* still functions as a clause linker in an inter-clausal position, often with an adversative 'but' meaning, or to convey surprise or sudden action. The language does not require syntactic clause linking (Haile 1926), but narrators may optionally use *nít'ę́ę́'* to link events and convey how events relate to each other in the context of the narrative. As an IU-Initial marker, or when it occurs as an independent intonation unit, *nít'ę́ę́'* likewise tends to carry an adversative meaning or convey an overtone of sudden, surprising, or new events. In his analysis of Coyote Stories, Webster (2011) similarly gives examples of *nít'ę́ę́'* serving to disambiguate actions of different participants and to highlight important action in the story. Alternatively, McCreedy, in her 1989 analysis of different genres of Diné texts, proposes that the discourse usage of *nít'ę́ę́'* comes from an extension of the past time function. She contrasts the use of *nít'ę́ę́'* with that of *'áádóó*, another marker said to signal a more significant coherence shift.

The initial development of *nít'ę́ę́'* as a clause linker is potentially related to its usage as a post-verbal past time marker. As speakers more frequently used *nít'ę́ę́'* after verbs, then *nít'ę́ę́'* would appear in an inter-clausal position when speakers produce two clauses in quick succession or within a single intonation unit. Similar markers have been described in other languages with a range of overlapping meanings including contrast, resultatives, and counter-expectation (Overall 2009: 189).

Equally likely, the current discourse usage may be an extension of the pragmatic notion of "interrupted action" that has been associated with the post-verbal particle (Haile

1926). In many of the examples in these data, *nít'ę́ę́'* occurs with verbs that describe actions or states that were interrupted and are no longer true. This sense of an interrupted state or action could be metaphorically extended to convey the adjectival meaning of a person who has passed away. On a discourse level, pragmatic overtones of interrupted or stymied action could in turn be mobilized to mark a significant narrative juncture, surprise, or sudden new action. Again, this use of *nít'ę́ę́'* is more frequent in pear film retellings and in The Coyote and Emergence Stories, where speakers convey a set sequence of events and may be more motivated to add interpretative framing to an established storyline.

6.7. Conclusions

In this chapter, I have described earlier functions of the Diné particle *nít'ę́ę́'* and presented its usage in contemporary connected speech. I propose that the particle may have undergone polygrammaticalization developing from a verb into a discourse marker, often indicating sudden or new events, and into a marker of habitual past. Overall, the functions and syntactic distribution of *nít'ę́ę́'* found in these stories are very similar to those recorded in earlier texts, suggesting that the multi-functionality of *nít'ę́ę́'* is not a new phenomenon.

Diné speakers, like all speakers, have many options in how they portray events in a story. The discourse choices of speakers will continue to shape the grammar, and slight generational shifts are anticipated as part of the natural evolution of the language. The observed intergenerational patterns presented here are non-significant and do not definitively reflect changes-in-progress. Yet, younger speakers show signs of increasing their frequency of *nít'ę́ę́'* in the past time function and using fewer tokens of *nít'ę́ę́* as a discourse marker. Further, younger speakers distinctly pronounce *nít'ę́ę́'*, potentially influenced by how the

particle is written. Finally, while the significant contact with English may ultimately result in morphosyntactic changes to the language, there is no evidence that English-Diné bizaad bilingualism is motivating any changes in the usage of this particular particle.

These results add to the literature on Diné particles, an often-overlooked area of Diné grammar, and a topic that is best explored with connected speech. From a methodological perspective, this chapter underscores the importance of gathering different kinds of data when investigating morphosyntactic phenomena. Both in the historical and modern-day discourse, the patterns of usage differ in different discourse genres, and only by undertaking a close comparison of the realization of *nít'ę́ę́'* in multiple genres of connected speech, does a clearer picture of its layered functions emerge.

Chapter 7

Language Attitudes and Ideologies

7.1. Introduction

This chapter shifts the focus from analyzing variation and change in structure to analyzing variation in language usage, attitudes, and ideologies, defined as a "set of beliefs about language articulated by users as a rationalization or justification of perceived language structure and use" (Silverstein 1979: 193). I present the following analysis to contextualize the individual studies of linguistic variation that have been the focus of the previous chapters, and to incorporate the voices and perspectives of individual participants in the study. Like variation in other domains of language, language ideologies are shaped by a complex interaction of factors such as age, region, socioeconomic class, education, and social network (Field and Kroskrity 2009). Therefore, I do not assume that the opinions expressed in these discussions reflect homogenous beliefs within the Diné community or uniformly consistent beliefs for each individual speaker (cf. Irvine and Gal 2000; Field and Kroskrity 2009; Preston 2018). The analysis builds on findings presented in earlier studies of Diné language ideologies (Witherspoon 1977; Parsons-Yazzie 1995; Field 1998, 2009; House 2002; Peterson 2006; Lee 2007, 2009; Jacobsen 2017), and studies of ideological variation in other Native American speech communities (Gómez de García et al. 2009; Field and Kroskrity 2009; Field 2012).

The first goal of this chapter is to describe participant reports regarding domains of language usage. In addition to representing different generations, the participants in this study reflect some of the demographic diversity present within the Diné bizaad-speaking population, and their patterns of language use serve to supplement and update earlier research on Diné language vitality (cf. Lee and McLaughlin 2001). A second goal is to investigate prominent linguistic ideologies through a cross-sectional analysis of the English discussions. I consider evidence for ideological change or continuity based on age-correlated patterns and describe how these ideologies may impact current language maintenance efforts. As has been noted elsewhere for Diné bizaad (House 2002; Field 2009), as well as for other Native American languages (Mithun 2013), the reasons for language endangerment, and the attitudes towards changes in language vitality, can be very diverse. In §7.2, I provide a brief description of the qualitative methods employed in this chapter and then present the results in §7.3.

7.2. Data and Methods

The data presented here come from the English component of the interviews described more thoroughly in chapter 2. The questions were selected to target participant perceptions of linguistic variation, as well as their opinions of the current vitality of the Diné language. The full list of questions is available in the appendix, though not every interview proceeded sequentially; sometimes participants addressed answers in other questions or chose to not provide a direct answer to the question I asked.

Once the interviews were transcribed, I segmented the responses into seven broad categories using the qualitative analysis software NVivo and Excel. These categories include: self-reported experience learning Diné bizaad, self-reported domains of language use, self-

152

reported educational background, perceptions of and attitudes towards language variation, perceptions of and attitudes towards change, attitudes towards Diné bizaad and English, and attitudes towards codeswitching. Similar to the approach of Lee 2009, I analyze prominent themes that emerge in the data within these categories.

7.3. Results

The results are divided into two main sections. First, I summarize trends in language usage by generational cohort including educational background and experiences learning Diné bizaad and English. Then, I highlight recurring ideological patterns regarding variation and change. I follow a method similar to what Yin 2011 describes as "cross-person" where I include individual perspectives from select interviews but focus on the broader themes within groups rather than thorough descriptions of individual histories (Yin 2011: 240).[53] Whenever direct quotes are referenced, a citation to the archived time-aligned transcript and recording is provided.

7.3.1. Language Background and Usage among Older Participants

The fifteen older participants aged 60–75, include eight speakers from New Mexico and seven speakers from Arizona; there are nine women and six men. Prior to the interview, I knew four of the participants, while the remaining eleven I met the day of the interview. Four participants currently work as Navajo language teachers.

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[53] Thank you to Geneva Becenti for bringing this and other helpful sources to my attention.

The older participants share very similar language backgrounds. All of them acquired Diné bizaad as a first language, grew up speaking Diné bizaad at home, and did not speak English until starting school at around the age of six. Almost all attended boarding school for at least part of their education, and many remember being corrected on their Diné language by their parents and grandparents, most of whom did not speak any English. Half of them feel comfortable reading and writing in Diné bizaad.

Regarding current language usage, this group reports speaking Diné bizaad with Diné spouses, parents, siblings, Elders, and occasionally friends, co-workers, or acquaintances at church. Those that have children try to speak Diné bizaad to their children and grandchildren, who mostly choose to respond in English. A few participants expressed guilt at not teaching their children more Diné bizaad or for laughing at their kids while they were still learning, while others reported that their older children were proficient speakers. Those that live far from the Navajo Nation report speaking the language more when they go back to the reservation, or when talking to family on the phone. For instance, Elsie Casados, who lives in Española, New Mexico, a few hours' drive from the Navajo Nation, describes the challenges in switching back and forth between languages when she goes back to see her family: "Now when I go back it's really neat to quickly switch back to speaking in Navajo. But sometimes it seems like my mind you know, takes over (in) the English language" (18106-34 Elsie Casados Interview 00:03:56.970).

Overall this group is comfortably bilingual and has a general preference for using Diné bizaad with family or at the Chapter House and English at work. Participants who regularly attend traditional ceremonies associate these events with Diné bizaad. Social media usage is not very common amongst these older speakers, but a few people report using Diné bizaad on

154

Facebook. One participant, Leroy Morgan, is actively trying to speak Diné bizaad all the time in an effort to promote the usage of the language in all domains. Mr. Morgan, a longtime language activist and teacher, characterizes his approach this way: "And now I have this thing, I have this protocol, speak Diné language all the time because I do promote Navajo language, and I do immersion speaking, so I'm always constantly speaking Navajo whether I'm at the bank or at the tribal council" (18106-40 Leroy Morgan Interview 00:07:03.896).

7.3.2. Language Background and Usage among Middle-aged Participants

The group of twenty-two middle-aged speakers aged 40–59, includes ten speakers from New Mexico and twelve speakers from Arizona. There are fourteen women and eight men. Ten of them are current Navajo language teachers and several others are educators. I knew five of them before the interviews.

Amongst the middle-aged speakers there is more variability in experiences learning Diné bizaad. Most still report acquiring Diné bizaad as a first language and speaking it in the home with parents or grandparents, and others learned the language later in immersion schools or language classes. A few people described how their parents did not want to teach them Diné bizaad based on their own negative experiences in English-only boarding schools. A frequently recounted progression was for participants to start out speaking primarily Diné bizaad, but by the time they were teenagers, they were bilingual and began to increasingly prefer English. Wilma Lee, a woman from Pine Springs, Arizona, recounts this sudden shift in her own language usage: "I grew up with both my parents so they both talked in Navajo. I think after you learn English you end up speaking English" (18106-31 Wilma Lee 00:01:56.670). Some participants attended boarding school, but far fewer than the older

generation; among this group it was more common to attend a local day school. Out of twenty-two speakers in this group, fifteen can read and write in Diné bizaad, and another four can read, but not write.

These middle-aged speakers report using Diné bizaad in ceremonial and cultural contexts, with their parents, and amongst Diné-bizaad speaking spouses, friends, family, Elders, and some co-workers. With friends and family, Diné bizaad feels more comfortable, and jokes were described as being funnier in Diné bizaad. Among this group, many reported speaking both languages to their children, though again their children tend to respond in English. For these speakers, English is the preferred language at school, at work, or with non-Diné bizaad-speaking people. A few discussed how they view Diné bizaad as a private language that they use when they want to have an intimate conversation in public. Some in this group also mentioned that now that they are older, they prefer to use Diné bizaad more, a trend likewise noted in Lee and McLaughlin 2001.

This group consistently expressed the belief that Diné bizaad is used more within the Navajo Nation and described the difficulty of using the language while being away from the reservation. Some feel like they are losing their own language skills, living in cities, where they do not use the language as much. Valerie Tapaha, a Navajo language teacher, describes her experiences as a Diné bizaad speaker in Albuquerque: "I think I'm in between both languages, because as you get away from the language, you tend to start losing some of it, and so I think I'm growing more into the English language, and I'm kind of, not really, but just a few things here and there, I'm starting to lose it" (18106-17 Valerie Tapaha 00:04:44.015). Others expressed difficulty at staying in the language even with other fluent speakers. Some speakers in this group use Diné bizaad on social media where they engage with Diné bizaad

156

online resources like a Diné bizaad Facebook group. A few participants described positive experiences with KTNN, the Navajo radio station, as a way to continue hearing the language when they are away from the Navajo Nation.

7.3.3. Language Background and Usage among Younger Participants

The group of fourteen younger speakers, aged 18–29, includes four speakers from New Mexico and ten from Arizona. This includes eight women and six men. There was one Navajo language teacher in this group, and I knew three of these participants before the time of the interview.

There were two consistent factors leading to Diné bizaad language learning among these younger speakers: significant time spent with grandparents and attendance at Diné immersion schools. Almost all of these participants reported spending a significant amount of time with their grandparents while growing up, and a few were raised exclusively by Diné bizaad-speaking grandparents. Some members of this group were raised with bilingual parents where both languages were spoken in the home, while others were raised by parents that only spoke English. A few participants remarked that they speak more Diné bizaad than their parents. There were also participants who reported primarily learning Diné bizaad through immersion schools; in particular, several participants in this group went through the *Tséhootsooí Diné Bi'Ólta'* immersion school in Fort Defiance, Arizona. A few attended boarding schools for a short time, but day schools were overall more common.

These younger speakers reported using Diné bizaad with Diné spouses, with parents or siblings, with Elders, and in Navajo language courses in school. A few participants use Diné bizaad regularly on social media. Many in this group say that it is difficult to speak Diné

bizaad outside of a classroom setting because people in their age group do not speak the language. Most of the participants in this group do not have kids yet, but those that do talk about teaching their kids how to introduce themselves with their Diné clans. Thirteen out of fourteen of these younger speakers know how to read and write in Diné bizaad.

7.3.4. Summary of Language Usage Patterns

These results are largely consistent with what has been described in previous studies for patterns of language usage in contemporary Diné life (Lee and McLaughlin 2001; Benally and Viri 2005). Diné bizaad is still strongly associated with ceremonies, the Navajo Nation government, and more broadly with life on the reservation, family intimacy, and humor. Most of the younger participants primarily use the language with their family, especially their grandparents. However, many of the middle-aged and older speakers professed to not know any Diné bizaad speakers under age thirty, and even among middle-aged and older speakers, Diné bizaad seems to be becoming increasingly restricted to the aforementioned domains. With the exception of the dedicated effort of select individuals to speak the language all the time, even fluent, first language speakers are speaking more English with each other as the default language, a progression of previously reported trends (Lee and McLaughlin 2001). Most participants with children do not speak the language with their children, and if they do, their children do not respond to them in Diné bizaad. Furthermore, in the interviews, some participants express concern that fewer people know the traditional ceremonies than when they were younger and that reduced versions of ceremonies are becoming increasingly common. Lee and McLaughlin 2001 similarly found that even in ceremonies, a domain strongly associated with Diné bizaad language usage, English is gaining ground.

Conversely, these results also present some positive developments with regards to language vitality. As they age, many speakers report becoming more interested in speaking and learning Dine bizaad. This renewed investment in the language may stem from a desire for speakers to connect with and pass on their cultural identity, as they grow and mature, or may arise because middle-aged and older adults are more frequent participants in domains typically associated with Diné bizaad usage.

Furthermore, several participants in this study attribute their interest and ability to speak Diné bizaad to their experiences at Diné bizaad immersion schools. These results exemplify the success of immersion programs and align with earlier research describing the achievements especially of the Fort Defiance and Rock Point schools (Arviso and Holm 2001). The achievements of these programs engender optimism for Diné language vitality as intergenerational trends attest to the reality that the classroom, rather than the home, is increasingly prevalent as the primary site of language transmission. Though Diné bizaad literacy rates are generally thought to be low (Spolsky and Irvine 1982; Jacobsen 2017), the majority of participants in this study do read and write in Diné bizaad, and literacy rates are especially high among the younger speakers who attended immersion schools.

7.4. Language Ideologies

This section presents a discussion of prominent language attitudes and ideologies towards variation and change. As an interviewer, I explicitly asked questions about what participants observed and thought about variation by region, gender, and age. The discussion thus centers on these topics, along with attitudes towards language change, and other subjects that arose spontaneously in the interviews.

7.4.1. Variation by Region

Participants of all ages expressed a strong perception of regional variation. For many speakers, distinct dialects are associated with an Eastern variety spoken in New Mexico, a Western variety spoken in Arizona, and less frequently, a Northern variety spoken in the region from Shiprock to Utah, and a Central variety in the Fort Defiance/Window Rock area. In addition to linguistic variation, there are believed to be lifestyle or cultural differences between the regions that include the structure of formal clan introductions, songs, dances, stories, and livestock. Another significant ideological boundary exists between urban and reservation communities. As Perfilliea Charlie, a language teacher living in Flagstaff notes about Diné people who grew up in cities, "Their language is different, their practices are different, their customs and wardrobe is different, all the way to the food style is different" (18106-41 Perfilliea Charlie Interview 00:28:59.743). Beyond region, the language is also thought to vary by domain. The language in the hogan is described as different from that in the house, at the Chapter House, in ceremonies, and at Native American Church events.

For many participants, regional variation is strongly associated with lexical variants. For instance, the word for 'snow' as *yas* (Western) or *zas* (Eastern) was the most frequently cited example of a marker of region. When asked for additional examples, several participants volunteered neologisms that vary by region. For example, the word for 'soda' came up repeatedly with variation between *tółich'íí'í* 'spicy water' in New Mexico, and *tó dilchxoshí* 'bubbly water' or *tó łikaní* 'sweet water' elsewhere.[54] Besides a handful of words though, overall regional differences were often described as being relatively minor with a high degree

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[54] A list of lexical variants from the interviews is available in the appendix.

of mutual intelligibility between regional varieties. Cited differences include slight variations in intonation or degree of nasalization.

In these discussions, multiple ideologies emerge regarding regional linguistic variation. Many speakers adopt a variationist stance whereby regional varieties are considered equally valid and authentic despite their differences (Kroskrity 2002; Field and Kroskrity 2009; Field 2012). This ideology is exemplified in the following quote from Cathy Smith, a Navajo language teacher in Bloomfield, New Mexico. She describes how she prepares her students for regional linguistic variation when teaching with Arizona-based curriculum materials: "I try to tell my students that it's the same, it's just different ways of using the language. Just certain words, that are different from that area and what I'm used to, and what I was taught" (18106-33 Cathy Smith Interview 00:38:04.773). Peggy Manygoats, a Navajo language teacher from Page, Arizona, expressed a similar attitude of acceptance when her students bring up examples of variation: "Some of the students here even notice that, well this is how my grandmother says it. Well that is fine, if that's how they say it, that's okay. You know I'm flexible either way because it's how they grew up and other dialects are different" (18106-14 Peggy Manygoats Interview 00:20:17.965). Some younger speakers likewise adhere to this ideology. Gypsy Pete, a younger woman from Rock Point, Arizona, says, "I honestly believe that every region is unique in their own way, every community is unique in their own way. And being that's how their ancestors, how their great grandparents, how they were raised, it's how they would talk the language, there is no specific way of saying a certain word" (18106-09 Gypsy Pete Interview 00:30:35.482).

At the same time, beliefs about regional variation simultaneously evoke ideologies of linguistic purism (Dorian 1994; Holton 2009; Webster 2015). Some participants evaluate

161

certain regional varieties as more authentic due to their association with a traditional lifestyle of herding and living close to the land, and a perception of less contact with other local languages, such as varieties of Apache and Southern Ute, as well as the colonial languages of English and Spanish. Among participants, there is a very pervasive attitude that the language spoken by Elders is more intact than the language spoken today, and that in areas that are more isolated, some of this "real", "traditional", and "old" language is still spoken. These opinions resonate with earlier descriptions of *saadsání* 'old language' associated with grandmothers, thought to represent a prestigious, idealized form of the language (Peterson 2006; Jacobsen 2017). In these interviews, examples of places where this more traditional variety is reportedly spoken include the relatively isolated reservation communities of Big Mountain, Black Mountain, Piñon, Little Blue Gap, and Navajo Mountain.

More broadly, a "traditional" variety of language is frequently associated with speakers in Arizona. These impressions were reported even amongst people who rarely travel to Arizona or interact with people from other regions. For instance, Darlene Frank from New Mexico says, "I would have to say (the language in) Arizona (is better) because, I've just seen a lot on social media that the language from Arizona, Chinle or out that way, it seems clearer" (18106-15 Darlene Frank Interview 00:22:45.655). Elsie Whitehorse Walck, a speaker who now lives in Colorado but grew up in Kaibito, Arizona, characterized it this way: "The Western side of the reservation tends to be more, I guess, I don't want to say old school, but more traditional. I've been in this area on the Eastern side of the reservation now for 16 years and it seems to be like a two-generation gap" (18106-36 Elsie Whitehorse Walck Interview 00:32:14.073). Relatedly, Michelle Lee from Rock Springs, New Mexico, says, "I thought I was really fluent but when I hear someone from the deep rez and I'm talking about Ganado or

162

something like that, they can really talk with more speed and accuracy and it just rolls" (18106-32 Michelle Lee Interview 00:17:50.530). Finally, Willeen Bennally from Shiprock, New Mexico, describes the Arizona speakers this way: "The way they pronounce their words it's so strong, the way they pronounce the word, and they're so fast at speaking at it. Versus over here, we have a lazier dialect" (18106-24 Willeen Bennally Interview 00:34:18.993). Linguistically, this idealized variety is reported as being very descriptive and including old words that are no longer used elsewhere. In these areas, English is thought to be used minimally. One factor proposed as contributing to this engrained association between Arizona and a more authentically Navajo language may be the over-representation of Arizona in anthropological studies of Diné life (Jacobsen 2017).

A common explanation put forth for why people in the remote Western areas speak a more authentic variety of the language, is that a number of people in those areas are thought to have evaded capture in the 1860's and thus did not participate in the Long Walk. During the four-year imprisonment of around 8,000 Diné people at Bosque Redondo, interactions between different groups are perceived as resulting in linguistic and cultural mixing with Spanish, Apachean languages, Diné bizaad, and English. In particular, the language spoken in New Mexico is perceived as now being heavily influenced by Spanish and Apache. Tom Warren, a language instructor who works in New Mexico says that, "(In the) Eastern agency the Navajos tend to use, majority of the words are, related to Mexican Spanish words" (18106-20 Tom Warren Interview 00:30:27.272). An example of the Spanish influence is the word for penny; in New Mexico people reportedly say *sindáo*, a borrowing from Spanish *centavo*, while in Arizona people prefer *łichíí'* 'it is red' (18106-39 Louise Ramone Interview 00:30:57.629). People are also said to speak faster in Alamo, a Diné community located

southwest of Albuquerque, or in the Eastern region more broadly, as described by Vincent Werito, an assistant professor at the University of New Mexico, Albuquerque. Mr. Werito is originally from a community near Torreon, New Mexico. He says, "The folks on the Eastern side tend to chop words and speak faster. In some ways, they say it kind of sounded like Apache" (18106-26 Vincent Werito Interview 00:36:13.870).

While the Arizona variety is considered by most participants to be more correct or authentic, this opinion was not universal. Some New Mexico speakers gave examples of the remote towns of Ojo Encino and Torreon in New Mexico when asked where the best Diné bizaad was spoken, and where young people were still learning the language. Zachariah Jason George, a younger speaker from New Mexico characterizes the authenticity of New Mexico language this way: "the Navajos in the New Mexico area, we stick with the old version of the language, of how you pronounce things, of how you say things, we are more of the old-fashioned language. But then Arizona territory is more, they're trying to make the language more modernized, more descriptive, so it kind of gets mixed up. I wish everybody spoke, one language, without trying to make it so fancy or so modernized" (18106-25 Zachariah George Interview 00:22:51.444).

As pointed out in Jacobsen 2017, Diné language authenticity is not binary, and there is always a "deeper rez beyond the horizon" (Jacobsen 2017: 6). In this same way, participants typically rated isolated Arizonan and occasionally New Mexican communities as maintaining the most "old Navajo", followed by other towns in the Arizona side of the Navajo Nation, and then larger reservation towns like Shiprock, New Mexico. Speakers in the off-reservation border towns, where Diné bizaad has been described as highly stigmatized (Webster 2015),

164

are thought to speak the least Diné bizaad and to be more difficult to understand with shortened words and grammatical mistakes.

7.4.2. Variation by Gender

According to many of the participants, there is not significant internal variation between the speech of men and women. The cited differences include a number of kinship terms that differ based on the gender of the speaker, and for older speakers, there is thought to be some avoidance of certain words by men or women due to their association with the other gender. Similarly, there are topics that are argued to be appropriate for men and women to talk about, which in turn are said to influence word choice.

However, one stylistic difference that arose in several interviews is the belief that men are more expressive in Diné bizaad, perhaps due to their perceived roles as storytellers and leaders. Ms. Bennally recounts how in her experience, "Men are more playful with the language, and they know how to tease with it. And then women I think are very careful" (18106-24 Willeen Bennally Interview 00:35:32.245). A few participants pointed to the men serving as Navajo Nation council delegates as having a distinct Diné bizaad style.[55] They reportedly speak in low tones, in a serious way, and are perceived as having a more "old school" or "stoic" variety of the language. Jacobsen 2017 similarly noted that a deep voice is associated with Diné men.

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[55] For research on the language of Navajo Tribal Council meetings, I direct interested readers to Nuendorf 1987.

7.4.3. Variation by Age

Among speakers of all ages, there is a strong perception of intergenerational differences in the language; there is a consistent opinion that the language is changing with regards to usage patterns, lexical innovation, and linguistic structure. In terms of usage, patterns have changed remarkably especially over the course of the older participants' lifetimes. As Annie Walker, an older woman from Arizona reported, "I think that the way I see the situation on the reservation is that Navajo is no longer a primary language. It's more or less English is a primary language. And Navajo is like, what English used to be. A second language" (18106-16 Annie Walker Interview 00:28:42.336). Almost all participants mention how the language is endangered, is fading to small groups of speakers, or is being lost due to lack of usage in the home. Many participants acknowledged that schools were trying to teach the language, but most believe that without reinforcement at home, the language will not be adequately maintained.

Another aspect of language usage that is perceived as illustrating intergenerational change is an increase in codeswitching between Diné bizaad and English. Codeswitching—the use of two or more languages within discourse—has been previously documented as increasing in Diné bizaad in recent years (Canfield 1980; Schaengold 2004; Field 2009; Jacobsen 2017). Similarly, in this group, most people reported codeswitching between English and Diné bizaad, even highly proficient speakers. Opinions towards codeswitching were mixed; some people said it was acceptable amongst bilinguals, but not with Elders who might not understand. Furthermore, some viewed codeswitching as a skill that should be accepted because it promotes understanding, and some words are better in either Diné bizaad or English. Ilene Ryan, a Navajo language teacher in Flagstaff, captures the conflicting sentiment

166

expressed by several participants: "I wish that we didn't do that, but you know there are some new things in our lives that we really don't have a word for in Navajo. And then I think we're so busy expressing ourselves in English that when we try to express ourselves in Navajo our English mind takes over and we start inserting some English words. And sometimes it's easier to just say it in English, you know, instead of sitting there trying to describe what it is we're saying in hopes that whoever we're speaking to will understand" (18106-27 Ilene Ryan Interview 00:36:49.160).

In terms of lexical changes, participants described how different words are being borrowed from English, new terminology is being coined for technology and other innovations, and older words are being lost. For instance, many participants lamented that older words for ceremonial topics, kinship, time, weather, and seasons are no longer used. Exemplifying a new coinage for technology, Ernest Harry Begay, an older man from Rock Point, Arizona, provides *saat'agii* for 'texting' from the literal meaning 'words that fly' (18106-18 Ernest Harry Begay Interview 00:30:42.288). The coining of new words—a longstanding process in the language (Peterson and Webster 2013)—is thought to increase regional and idiolectal variation as varying descriptive neologisms develop among different groups (Reichard 1945). One younger participant, Shandiin Yazzie, expressed the attitude that coinages were sometimes too specific or "over-descriptivized" (18106-04 Shandiin Yazzie Interview 00:34:48.548). Peterson and Webster 2013 report a similar opinion regarding how some speakers consider new Diné bizaad terminology to be too specific. At the same time, these words are sometimes characterized as "slang", reflecting their status outside the more accepted Diné lexicon.

Present throughout these observations is an ideology of Elder purism, against which the speech of younger, less proficient speakers is often evaluated. Negative assessments of language change are not unique to endangered languages (Dorian 1994; Holton 2009), though speakers may be more sensitive to generational changes in these contexts (Bird and Kell 2017). Even the older participants themselves, aged 59–75, feel that they did not speak as well as the Elders that came before them, an opinion noted in Peterson 2006. In these interviews, Elders are described as using the language in a precise, descriptive fashion with specific vocabulary, expressive tones, and the ability to both have fun with the language, as well as to sound sincere.

In contrast, there is an emergent variety of the language associated with speakers in their thirties and forties. Many of the changes associated with this new variety are considered incorrect. A common way of describing this newer variety of Diné bizaad is "slang", often referring to contracted and mispronounced words with grammatical errors. The differences between the new and older varieties of the language is said to be vast, described by some as two different languages that are not always mutually intelligible. Speakers of the new variety of the language are characterized as being less descriptive and detailed, as mixing English and Diné bizaad, and as using "short cuts" or contracted words. An example that came up in multiple interviews as exemplifying this is the expression *t'óó báhádzigo* meaning 'extremely' or 'very' shortened to *t'óó wádzo*. In the same vein, an example of a "slanged" expression by younger speakers is: *shił hózhǫ́* instead of the more complete sentence preferred by Elders, *'ayóo baa shił hózhǫ́* 'I feel very balanced, in harmony' (18106-37 Blaine Henry (pseudoynm) Interview 00:41:29.795). Other criticisms of this new variety include the fact that speakers do not complete their thoughts, they pause more, they use more basic vocabulary,

they make grammar mistakes especially with person or mode markers, they use English-like word order, and in general they sound more white.

Relatedly, several Navajo language teachers described how difficult it is to teach younger speakers how to use the language in an expressive way with the correct pronunciation (cf. Bird and Kell 2017). Students especially struggle with pronunciation features not found in English such as high tones, nasals, glottalized consonants, and the sound /ł/. Mary Whitehair Frazier, a Navajo language teacher in Albuquerque, discusses the implications for these changes: "We're going to lose the authenticity of how certain words are pronounced, you know the pronunciations, the differences in sounds and meaning, and then it's going to lose its whole meaning to what we were taught or what our ancestors have given us" (18106-29 Mary Whitehair Frazier Interview 00:36:46.104).

At the same time, the newer variety spoken by younger speakers is described as being more careful and academic. This is thought to be because younger speakers are afraid of being reprimanded and because many of them learned to speak the language in school. Exemplifying this is Ms. Bennally. She describes the differences between how she speaks and the older speakers: "I always call it like old Navajo or ancient Navajo, versus like, academic Navajo. There is such a difference. I sit here putting sentences together in my head, thinking SOV, thinking subject object verb, because that's how I learned it in high school" (18106-24 Willeen Bennally Interview 00:37:15.937). Another younger speaker, Alvanna Yazzie from St. Michaels, Arizona, says, "The way my generation speaks is a little basic. It's like more practiced" (18106-07 Alvanna Yazzie Interview 00:24:20.566).

7.4.4. Attitudes towards Diné Bizaad

Alongside a discussion of how the language is changing, the conversations touched on what people value about Diné bizaad, and why the language is important. On the one hand, English is more widespread among speakers of all ages, and maintains a high level of overt prestige associated with education and economic opportunity. On the other hand, many participants consider Diné bizaad to be more expressive than English and view it as retaining communicative utility in certain contexts. In terms of expressive value, jokes are considered by many to be funnier in Diné bizaad, words are thought to have more meaning, and the language is evaluated as being more descriptive than English. As Mr. Morgan says, "(The) Navajo language is visual, it's very descriptive. And so, when you're talking Navajo, you already have this television in your head, and you can just actually see it in action" (18106-40 Leroy Morgan Interview 00:36:33.720). As will be described below, many of the beliefs expressed here resonate with those described in other studies, especially the notion that Diné bizaad is more descriptive and difficult than English, making it better suited for certain interactional contexts (Gómez de García et al. 2009; Peterson and Webster 2013).

For many participants, the Diné language represents an emotional connection to identity, family, community, and way of life. Blaine Henry articulates this opinion when he says, "This language comes with, history, culture and tradition, and it comes with integrity. And within that integrity if we do not take the time to relearn it, preserve it and nourish it back into our younger generation, our identity and the way that we cope with things in life, it's going to be altered because our language, it produces and illuminates our culture and our tradition. And that is the only thing today that really separates us, from being Native or Indigenous, or Diné. And that language today is what really gives us that identity" (18106-37

170

Blaine Henry Interview 00:51:25.645). Several participants who take part in Diné ceremonial traditions stated that the language is sacred and necessary for songs, ceremonies, and communication with the Diné deities; if the language disappears, the deities will be gone. Some Christian participants likewise associate Diné bizaad with prayer. Even participants who do not use the language regularly express an emotional connection to the language. Tia Tsosie Begay from Tucson explains what it is like to use the Diné language with her husband: "I feel like there's an intimacy between us, to speak Navajo. I enjoy the intricacies of the language because it's so expansive" (18106-12 Tia Tsosie Begay Interview 00:30:08.322).

Diné bizaad continues to be valued as a means of communication in the home amongst family, with whom it would be strange for some speakers to speak English, and with monolingual Elders. Many middle-aged speakers recounted how it brought them joy to help monolingual Elders with English-dominant tasks such as grocery shopping. For the time being, the Diné language remains sufficiently widely spoken by middle-aged and older Diné people that there is still perceived utility in speaking Diné bizaad. Leonard Perry, a scholar and chapter official from Crownpoint, New Mexico, says that the language will continue to be useful, "as long as there's going to be somebody that'll understand it" (18106-21 Leonard Perry Interview 00:29:54.943). Some participants professed to value their bilingual identity more than their ability to speak Diné bizaad alone. The way they see it is that their proficiency in both languages gives them the ability to speak with more people, and there is a sense of pride at being able to move between languages with a high level of fluency in different contexts.

As Diné bizaad continues to be strongly associated with family and Elders, the language is not associated with young people. The overwhelming majority of participants

171

expressed the opinion that a typical Diné bizaad speaker is an elder, often wearing traditional clothes and jewelry, or sometimes a government leader. Furthermore, many young people reported that their peers are ashamed of using the language, though they themselves professed to not sharing this attitude. Eugene Yazzie explains that this shame is especially common in the border towns, while young people living in the interior of the reservation are more comfortable speaking the language.

Relatedly, among younger speakers, there is a shared ideology of Diné bizaad being difficult to learn. Many younger speakers learned Diné bizaad in school in addition to acquiring it from their grandparents. This exposure to a more formal academic perspective on the language has given these younger speakers a high level of meta-linguistic awareness in comparing the structure of Diné bizaad to English. While the perceived difficulty of Diné bizaad may discourage some language learners, it appears to be a point of pride for others. Mary Perez (pseudonym) expressed this notion, "What I like about speaking Navajo is that I can still do it. People always tell me it's one of the hardest languages to learn and I'm just fascinated by how we picked it up and can still speak." Likewise, Ms. Yazzie—an immersion school graduate— says, "it's different from languages around the world, in fact (it's) one of the hardest languages, so I believe I'm fortunate to know my language, and I'm glad I got to learn my language" (18106-07 Alvanna Yazzie Interview 00:25:53.499). This pride in knowing a difficult language has been described for other Indigenous languages (Taylor 1989).

7.4.5. Beliefs about Diné Bizaad Vitality

While speakers within this group had varied perspectives on language vitality, most participants expressed concern about the current state of the language and what that means for its future. As Aliah Casuse, a younger speaker from Arizona, says, "I don't really see it, being alive as it is right now. It's sad to say but, I don't really see it being used with the rate it's dying right now, and even like me I feel like it's not, being prioritized" (18106-06 Aliah Casuse Interview 00:37:34.932). Roberta Gorman, a Navajo language teacher in Flagstaff, adds, "The belief where Navajo is very sacred, where we as Navajos, we were put on this earth only to speak that language, is gone" (18106-23 Roberta Gorman Interview 00:50:41.743).

The Navajo language teachers who participated in this study recounted experiences that support the perception that English is replacing Diné bizaad. Many language teachers shared stories of how they have far fewer fluent speakers in their classrooms than in previous years, and how it's become more difficult to teach the language. Ms. Tapaha says, "All I can say is that it's getting harder and harder to teach. It's just a struggle because there's no reinforcement in the home" (18106-17 Valerie Tapaha Interview 00:29:47.085). In reflecting on her many years teaching, Mrs. Gorman says, "When I first taught in Chinle back in the 90s, I had kids from Cottonwood area, Lukachukai area, Many Farms area, and if I had twenty-five kids, maybe half of the kids were Navajo speakers. (Now) out of the nineteen kids, (I have) only one fluent speaker" (18106-23 Roberta Gorman Interview 00:47:15.695).

When asked about specific challenges to language maintenance or revitalization efforts, participants offered several explanations. Cited challenges include the lack of prestige among younger speakers, criticism from elder speakers towards younger speakers, an

intergenerational gap whereby many young parents do not speak the language themselves and thus cannot teach their children, and the prevalence of media dominated by English. Participants discussed how in order to reverse this trend, there needs to be a stronger effort from all stakeholders: schools, the government, families, and a concerted effort to cultivate more bilingual domains and immersion programs. While language preservation is certainly a commonly discussed topic in and around the Navajo Nation, the current efforts have yielded disappointing results for many in this group: "People talk about maintaining, preserving, our language because it's the thing to say, what do they say in America, politically correct, to say that. But to do it is a whole different thing, and I personally think that parents really need to utilize it in their home" (18106-18 Ernest Harry Begay Interview 00:21:56.492). The current trends are particularly worrisome because the Navajo Nation population is so young. Gerald Pierce describes the challenges facing the younger generation this way: "I think that (the) younger generation, they're caught between. They can't really learn Navajo because there is nobody to teach them at home. So most of the time they try to learn, but they have a hard time with it, so they just get frustrated I guess, and they don't really use it" (18106-28 Pierce Interview 00:42:07.950).

Prevalent throughout these discussions is an ideology of the close connection between language and culture with language loss entailing cultural loss; as fewer people speak the language, the Diné identity is perceived to be disappearing. As Mrs. Tsosie Begay says, "And so then as the culture goes away, there'll be no more Navajo people anymore because nobody knows Navajo, and they don't know the culture anymore either" (18106-12 Tia Tsosie Begay Interview 00:29:15.385). Mrs. Whitehorse Walck offers a similar perspective of language shift exacerbating cultural shift: "I think that the non-exposure to the language has become a huge

barrier for the disconnect in the culture and the tradition" (18106-36 Elsie Whitehorse Walck Interview 00:32:14.073). A few people ascribed the linguistic changes to changes in the sociocultural context of language learning. Whereas among this group, many grew up with exposure to reservation life immersed in the Diné language and activities like raising livestock, participants say that most young people these days do not have those same experiences to draw upon in their language learning. Without that grounded input, the younger generation, especially those who grew up in more urban environments, lack the vocabulary and connection to the language. A somewhat common perspective is that when you learn the Diné language in a classroom, it will be learned as a different language than someone who grew up hearing it at home tied to the land and important cultural activities. As Mr. Werito, says, "In the classroom school context, it's not organic it's sort of static, and people say that's not the way it should be" (18106-26 Vincent Werito Interview 00:53:16.900).

A domain where the language is perceived as retaining significant value is in the traditional ceremonies. Arlyn John, a high school teacher living in Albuquerque, says, "I guess there's some value in today's world ceremonially. So that's where you see a lot of the younger speakers trying to speak it more, so they have access to the information the ceremonial information, the plants, information about plants and food. But not conversationally" (18106-11 Arlyn John Interview 00:36:03.547). However, the outlook even for ceremonial domains may be worrisome. Some participants recount how ceremonial practices are being lost as *hataałii* 'singers' and other practitioners are not teaching the next generation.

In general, speakers from the younger generation seem to be more optimistic about the future of Diné bizaad even though most of them report having few Diné bizaad-speaking peers. Several of them share the belief that the language is being maintained and will continue

to be maintained, though they recognize that there are obstacles to learning. A number of younger speakers expressed the opinion that the language will not disappear because of its sacredness. Jessica Dodson, a younger woman from near Page, Arizona, represents this perspective when she says, "I believe it will not even go, we will not lose our language at all. I mean that's something that's really sacred" (18106-08 Jessica Dodson Interview 00:33:50.264). Speakers also draw attention to the fact that there are many written materials in Diné bizaad and other language resources. Because of these resources, even if the language continues to fade, people can choose to relearn it at a later state.

Another widespread perspective is that the language will continue to be spoken, but within a bilingual Diné community rather than the monolingual context of previous generations, and cultural shift will accompany these linguistic changes. Many participants argued for an embrace of linguistic and cultural changes and mentioned the need to increase bilingual domains of language usage to better engage the younger generation. Field 2009 similarly reported an overt interest in a bicultural bilingual Diné society. For some, this acceptance of change represents the only path forward for continued Diné language use. Ms. Bennally sums it up this way: "We'll probably save the language in that way it'll turn and change into something else which is good too, but I just feel that we have to be able to be open to change. I think that's the change that's going to happen. But I feel bad that we're losing the old ancient words, the language, the stories, the phrases that were there. But that's just how cultures evolve into another thing" (18106-24 Willeen Bennally Interview 00:40:17.138).

7.5. Discussion

Among these participants, there is a range of opinions towards perceived variation and change, but also substantial continuity between speakers of different generations as well as ideologies expressed in earlier studies of Diné bizaad. Region, though not a significant factor in the analyses of the variables in chapters 4, 5, and 6, proves to be an important ideological factor for many participants. In terms of perceptions of regionally-based linguistic variation, results are mixed, with some people giving several examples, mostly of lexical variants, and others not noticing many differences at all. The overall lack of linguistic specificity in these observations aligns with the results showing that speakers from New Mexico are not significantly different from speakers from Arizona when it comes to the analyzed linguistic variables presented in chapters 4, 5, and 6.

Despite speakers not being able to pinpoint specific linguistic examples of regional differences, there is a widespread belief that pervades all three generations that the Arizona variety is somehow more authentic and traditional. This encompasses opinions that Arizona Diné have borrowed fewer words from Spanish and English, and the belief that in isolated areas in the "deep rez", an older Diné culture and language are more strongly maintained. This widespread perspective could have implications for future changes; features associated with the Western region could become enregistered with certain non-linguistic characteristics in a way that could influence the diffusion of potential changes. While the Arizona variety of Diné bizaad is considered to be more intact, the analyses of chapter 4, 5, and 6 again show there are no significant differences in the analyzed variables by region: these findings do not empirically demonstrate that an Arizona variety has undergone fewer changes or is more intergenerationally stable.

The conversation around age-based variation centered on the notions of an idealized, authentic form of the language represented by Elders and a traditional Diné lifestyle. For many participants, Diné bizaad is iconic with life on the reservation, raising sheep, wearing turquoise jewelry, and spending time with grandparents or Elders. The iconicity between language and culture is an ideology similarly attested in other Native communities which are facing threats to their languages and cultures (Irvine and Gal 2000). For some, though not all participants, the connection between language and culture extends to ceremonies, which tend to be domains of Diné bizaad usage. Unfortunately, the entrenched nature of the connection between Diné bizaad and ceremonies has resulted in some resistance amongst Christian families to Diné bizaad being taught in schools (Fernald and Platero 2000).

The idealization of the speech of Elders reflects a prevalent ideology of purism and contributes to reports of degradation in new varieties of Diné bizaad associated with younger speakers. Given the reported sociolinguistic differences between the generations, especially the increase in the use of English, significant linguistic differences between the generations are expected. Indeed, age-based patterns do emerge in the analyses presented in chapters 4, 5, and 6: youngers speakers produce /k^h/ with the shortest VOT values, produce more of the innovative /kl/ and /k͡ɬ'/ variants in the lateral affricates, and have a distinct pronunciation of the particle *nít'ę́ę́'*. However, speakers are largely unaware of these particular changes-in-progress, suggesting that other sociolinguistic variables are more meaningfully associated with age.

In terms of the outlook for language vitality, older and middle-aged participants expressed significant concern that the Diné language and culture are disappearing. English continues to gain ground as the primary code of communication for speakers of all ages, and speakers

younger than 30 are increasingly uncommon. Younger speakers primarily use the language with Elders rather than peers in a "vertical communication network", like that observed in other Indigenous speech communities (Schmidt 1985). While previous studies have discussed the negative implications of the language being exclusively associated with older speakers (Lee 2007), for many participants in this study, a strong driver to learn and use the language remains their desire to spend time with, and learn from, their grandparents. These norms of language usage may result in different sociolinguistic patterns that those recorded among generational cohorts with more internal interaction. Overall, the perspective expressed by this group of participants is one of significant alarm towards the rapid language loss they are observing, a different result than the "collective ignorance and apathy" reported in Benally and Viri 2005. While the majority of participants believe that the language is disappearing, many believe that Diné bizaad will be retained in ceremonial and family settings and as an important marker of identity.

Furthermore, Diné bizaad continues to be valued for its expressivity and complexity. Other scholars have discussed the origins of the ideology that Native American languages are more complex and detailed with one possibility including the influence of academic discourse—a genre dominated by non-Native researchers—often touting Native American languages as descriptive and difficult (Gómez de García et al. 2009). Indeed, the idea that Diné bizaad is difficult to learn has extended beyond the purely academic discourse. For instance, in his linguistics book written for a general audience, *What Language Is,* the linguist John McWhorter includes quotes such as the following about Diné bizaad: "It can seem like trying to grasp anything about Navajo is like trying to get a grip on a droplet of mercury" (McWhorter 2012: 65). While such sensationalized quotes about Diné bizaad may be

179

detrimental for the morale of learners, it is dually possible that this reputation has contributed to an increase in pride associated with this perceived difficulty.

7.6. Conclusions

This chapter described an overview of contemporary patterns of language usage and attitudes towards variation and change as reported by this group of 51 bilingual speakers. Together these results provide individual perspectives and ideological trends in order to contextualize the results presented elsewhere in this dissertation. These findings also point to linguistic, social, and stylistic factors to investigate in future sociolinguistic studies of contemporary Diné bizaad.

Chapter 8

Conclusions

8.1. Main Findings

This dissertation presents analyses of three variable features in Diné bizaad and trends in language usage, attitudes, and ideologies. First, through sociophonetic analyses of two variable sounds and an analysis of a multi-functional discourse particle, I describe the contemporary status of the targeted features, quantitatively assess the linguistic and social factors conditioning variation, and evaluate evidence for change. In each case, the role of language contact is considered as a motivator of change based on the patterns of distribution among speakers of different ages and linguistic backgrounds. In addition to the analyses of individual features, the documentation of recorded interviews consisting of vocabulary, personal stories, and participant perspectives on variation and change, adds to the existing record of Diné bizaad with a goal of reflecting internal diversity in the language due to regional, generational, and sociocultural variation. In this final chapter, I summarize the main findings from the analyses, discuss implications for these results, and suggest directions for future work.

Chapters 4 and 5 present phonetic analyses of the Diné voiceless stops and the lateral affricates respectively. In chapter 4, I discuss the aspirated stops and propose a subphonemic change in timing in Diné /kʰ/, whereby /kʰ/ has shortened in real-time to more closely match the voice-onset time of the English voiceless aspirated [kʰ], an externally-motivated convergent change. Based on center of gravity measurements, there is also a non-significant pattern in which Diné /tʰ/ has a high center of gravity among speakers in younger generations and women. At the same time, speakers of all generations robustly maintain the contrast in voice-onset time between unaspirated and aspirated stops. In chapter 5, I find incipient changes in the place of articulation of the unaspirated and ejective laterally-released affricates, /t͡l/ > /kl/ and /t͡l'/ > /k͡l'/, which I show to be convergent changes with both internal and external motivations. Together these changes are dually motivated by widespread English bilingualism, as well as by processes of phonetically-motivated change attested in monolingual communities. These phonetic descriptions add to recent research that applies acoustic methods of analysis to specific sound changes in endangered languages (cf. Babel 2009 on Northern Paiute; Chang 2009 on Southeastern Pomo; Haynes 2010 on Numu).

These findings show that Diné segments that are phonologically similar to English segments may be more vulnerable to contact-influenced change; sounds that are phonologically and acoustically similar to segments in English have become more English-like through substitution in the case of the lateral affricates or phonetic convergence in the case of the sound /kʰ/. These data further point to the limits of similarity, as the salience of Diné affricated /tʰ/ or /tx/ as different from English [tʰ] is sufficient to prevent its convergence. In terms of the models of second language acquisition discussed in chapter 1, these results are consistent with a hypothesis that English [tʰ] is considered a "new" sound among second

language learners, while English and Diné [kʰ] are evaluated as "similar". The maintenance of the laryngeal contrast in the stop series is in line with a prediction of Andersen 1982: contrasts shared between a minority language and a more socially-dominant language are expected to be maintained.

In terms of the investigated social factors, the observed variation does not significantly pattern with region or gender. Beyond one difference in VOT values between younger speakers from New Mexico and younger speakers from Arizona, region is not a significant factor in these analyses. However, in discussions about the language, many participants perceive region to play a role in variation especially with regards to pronunciation differences and lexical choices. Likewise, besides women having higher center of gravity measurements for /tʰ/, gender is not a statistically robust factor in these analyses. Nevertheless, in the observed frequencies, Diné women are most advanced in the subphonemic shortening of /kʰ/ and have far more innovative forms of the laterally-released unaspirated affricates. Most speakers do not report significant differences in the speech of men compared with women.

In contrast, these results do show some notable patterns based on speaker age and in one case, bilingual language background. Statistical analysis of the lateral affricates reveals that younger speakers are leading the observed changes, and variable patterns are present amongst bilinguals with different linguistic backgrounds: speakers that have been bilingual since birth (simultaneous bilinguals) strongly favor the innovative variants with velar onsets with no clear patterns among the other groups of bilinguals. In the other analyses, bilingual language background is not a significant factor in explaining the variation patterns, though in these data, language background is heavily correlated with age, and is quite skewed towards a higher representation of first language Diné bizaad speakers. Despite this imbalance,

findings show that Diné phonology remains relatively stable across bilinguals with different language backgrounds, even speakers who rarely use the language. Participants who report using more English, or who have acquired English as a first language, are not necessarily showing more contact-influenced effects in the targeted features.

The present availability of cross-generational synchronic data provides evidence that while subphonemic changes in the timing of /kʰ/ have taken place amongst all speakers, changes in place of articulation are newer innovations predominantly limited to the younger speakers. The results thus raise the question of the relative ordering of these sound changes. Studies of phonetic transfer in VOT have demonstrated that accommodation in an L1 towards phonetic targets of an L2 can happen very quickly, even after only five weeks of intense instruction (Chang 2010). Perhaps in situations of language contact, phonetic transfer via gradient convergence happens quickly, while phonological changes via substitution occur only after a longer period of contact or a short intense period associated with rapid shift. Regardless of the order of their actuation, these observed changes are non-neutralizing and not very salient to most speakers.

Chapter 6 describes variation in the discourse particle *nít'ę́ę́'* through an analysis of contemporary stories, as well as the distribution and function of the particle in earlier texts. I put forth an analysis of prior polygrammaticalization of the particle from an earlier perfective verb to its primary functions as a habitual past tense marker and a temporal clause sequencer. There is further evidence for ongoing changes in pronunciation and increased usage of the particle as a past tense marker among younger speakers. Language contact does not seem to influence variation in particle usage, nor are there any significant differences in how speakers from different regions, genders, or language backgrounds use the particle. Overall, this chapter

184

contributes an updated description of a Diné bizaad particle, a topic which remains less described than other domains of Diné bizaad grammar.

Chapter 7 presents an analysis of language usage and perceptions towards linguistic variation and change as reported from the perspective of the participants in this study. Among this group, the Diné language is generally favored among family members, Elders, and in ceremonial contexts, and continues to be valued for its expressive and emotional qualities. Yet despite this, speakers of all ages report speaking primarily English, and few speakers younger than 30 are perceived as speaking the language comfortably. Furthermore, many participants consider the Arizona variety of the language to be closer to an older, more authentic form of the language. At the same time, many changes are noted and negatively evaluated in the newer variety of speech associated with younger speakers. Overall, many participants expressed awareness and concern about the declining use of Diné bizaad.

These sociolinguistic and sociocultural dynamics connect to Diné language maintenance efforts. For instance, among these participants, the Diné language is consistently associated with Elders: proficient younger speakers report learning the language through close relationships with their grandparents when they were children, and middle-aged and older speakers talk about how they like speaking to Elders because they can help them navigate the English-speaking world, they feel emotionally connected to them, and they value the variety of language that Elders use. While in some ways, it may be detrimental to language learning if young people only associate the language with older speakers, the high esteem that many people have for Elders in Diné society could bolster participation in language projects involving Elders.

8.2. Future Directions

Results from this dissertation raise several compelling directions to explore in future research. In addition to the three variables targeted here, in the English portions of the interview, participants brought up many additional linguistic features that they perceived as varying such as nasalization, syntactic word order, intonation, speech rate, tone, and vowels. In future research, targeted perception studies could be designed to uncover the social meaning carried by these and other features. Another important dimension to more thoroughly understanding Diné variation is to consider language usage in different interactional contexts, especially conversation.

If there were community interest and permissions granted, future studies might also investigate regional variation through documentary projects focusing on varieties of Diné bizaad spoken in the non-contiguous satellite regions of the Navajo Nation: Tóhajileeh, Ramah, and Alamo. Comments during the English interviews suggest that these varieties are more distinct than internal variation within the "Big rez" and could be fruitful projects for uncovering more substantial regional variation, as well as contributing to a greater understanding of the effects of language contact, as these regions are believed to have distinct sociohistorical backgrounds.

Finally, it is the hope that the recorded and transcribed materials, as well as the descriptions and analyses of variables undergoing change, will be useful for language teaching. Published accounts of language teaching in other North American speech communities have demonstrated how variation can be successfully incorporated into language teaching curriculum (cf. Miyashita and Chatsis 2015; Bird and Kell 2017). In this case, the interview data are available online with links to the transcribed interviews including the

personal narratives and accompanying audio files. A separate compilation of the transcribed and translated personal narratives into a booklet specifically for language teachers is currently underway.

8.3. Conclusions

This dissertation project contributes to the existing documentary and descriptive record of Diné bizaad through the creation of recorded interviews with speakers representing diverse backgrounds. Through an in-depth analysis of three targeted variables that were hypothesized to be markers of social meaning, or to be undergoing changes, this work provides detailed insight into the language production patterns, as well as language usage and language attitudes, of the fifty-one represented participants. Together these results demonstrate that the targeted features do not uniformly become more variable or show signs of change; change is noted in some, but not all features. Furthermore, the types of changes that are observed show that despite the intense contact with English, the speech of these bilingual speakers remains relatively stable.

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APPENDIX 1: INTERVIEW

WORDLISTS

Table 1. Wordlist prompts and tokens of Diné /kʰ/

English prompt	Diné token	Following vowel
town	kintah	i
boy	ashkii	i
two	naaki	i
shoes	ké	e
Christmas	késhmish[56]	e
my shoes	shikee'	e
fire	kǫ'	o
cough	dikos	o
they (3+) are walking	yikah	a
I bring it OC	nishkaah	a

Table 2. Wordlist prompts and tokens of Diné /tʰ/

English prompt	Diné token	Following vowel
ice	tin	i
man	hastiin	i
he's carrying me	shoołtééł	e
donkey	télii	e
water	tó	o
soup	atoo'	o
thirty	tádiin	a
three	táá'	a
singer	hataałii	a
I kicked it	sétał	a

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[56] The word *késhmish* is borrowed from English 'Christmas'. See §1.4.2 for a discussion of borrowed words in Diné bizaad.

Table 3. Wordlist prompts and tokens of Diné /x/

English prompt	Diné token	Following vowel
man	hastiin	i
winter	hai	ai
pack	hééł	e
thorn	hosh	o
pus	his	i

APPENDIX 2: SAMPLE ENGLISH

INTERVIEW QUESTIONS

1. What is your name?
2. What are your clans?
3. Where were you born? What year?
4. Where did you grow up?
5. Where do you live now?
   a. For how long?
6. What was your first language?
7. How old were you when you started speaking English?
   a. Where did you learn it?
8. What language(s) did you speak while growing up?
9. What language(s) did your parents/caregivers speak?
   a. Your siblings?
10. Where did your parents grow up?
11. Did your parents attend school?
12. Are you married?
13. Where did your spouse grow up?
14. What language do you speak at home with your spouse/children?
15. Where did you attend school?
16. What is your occupation?
17. Which language do you speak best?
18. Do you read/write Navajo? Since when?
19. When do you use Navajo?
    a. with parents
    b. with grandparents/Elders
    c. with children
    d. at school
    e. with friends
    f. at work
    g. with spouse
    h. at church

    i. on social media
20. Do you attend ceremonies? Native American Church events? Other church activities?
21. Who do you spend most of your time with?
22. What do you like about speaking Navajo?
23. Do you think you speak "correct" Navajo?
24. Who do you think speaks Navajo "best"?
25. Have you noticed that the Navajo language has changed in recent years?
    a. If so, how?
    b. What do you think about these changes?
26. Do you think people speak Navajo differently in different parts of the region?
    a. If so, how?
27. Do you think that younger/older Navajo speakers speak differently?
    a. If so, how?
28. Do you think men/women speak Navajo differently?
    a. If so, how?
29. Are there any other people that you notice speak Navajo differently?
30. Do you think it's important to speak Navajo?
    a. Why?
31. What do you see as the future of the Navajo language?

APPENDIX 3: SAMPLE CONSENT

FORM

Procedure: This interview will consist of five parts and will likely take around 45-60 minutes. First, in English, you will be asked a series of background questions to gather some information about yourself and your experiences with the Navajo language. Second, you will be asked to provide a Navajo translation for a list of English words and phrases. Third, you will be shown a short silent film and then asked to describe what happens in the film in Navajo. Fourth, you will be asked to tell a short story in Navajo. Last, you will be asked a few more questions in English about your thoughts on the Navajo language. If you would like, you can further participate by helping the researcher transcribe and translate the data.

What is the purpose of this study? The purpose of this study is to determine how Navajo dialects vary based on region, age, or other social and linguistic factors. The types of variation analyzed will include sounds, word choice, grammar, and sentence structure with the purpose of contributing to Navajo language documentation and description. This will benefit speakers of Navajo in that it will contribute to a record of the language and may be used to develop teaching materials.

What data will be used in this research? The researcher will collect Navajo language data for inclusion in the study including audio recordings of word lists, narratives, the description of the film, and potentially conversation. Recorded data will also include English answers to background questions and questions about language attitudes.

What will happen to the data? The audio recordings will be used by the researcher for the basis of dissertation research and will be kept indefinitely. The recordings will also be deposited into the Alaska Native Language Archive at University of Alaska, Fairbanks where they may be available to future scholars and community members. If desired, copies of recordings will be provided for each participant.

What will be published? The researcher will publish results of this research in academic papers. Your name will be included in all publications as a data source unless you do not want your name to be included.

What will native speakers who help with the research gain from their participation? You will be paid $20 for your participation in this study.

Are there any risks involved in this study? Participation in this study is completely voluntary. You may ask to stop recording, and further may ask to have the recording deleted any point in time. If you wish to remain anonymous, I will use a pseudonym.

Information and questions If there are any questions, complaints or problems regarding this study, please contact me: Kayla Palakurthy, kaylaeisman@umail.ucsb.edu.

If you have any questions regarding your rights and participation as a research subject, please contact the Human Subjects Committee at (805) 893-3807 or hsc@research.ucsb.edu. Or write to the University of California, Human Subjects Committee, Office of Research, Santa Barbara, CA 93106-2050

1. Do you consent to have recordings of your interview used for linguistics research? Initials: _____

□ Yes, I give my consent.	□ No, I do not give my consent.	□ I still have questions.

2. Do you consent to have recordings of your interview placed in a language archive? Initials:_____

□ Yes, I give my consent.	□ No, I do not give my consent.	□ I still have questions.

3. Would you like your name to be listed as the source of the data you provided? Initials: _____

□ Yes, I give my consent.	□ No, I do not give my consent.	□ I still have questions.

4. *By signing below I certify that I have read and understand the above statements, and that I give approval for the data I give to be used in Navajo language research.*

APPENDIX 4: CHAPTER 4

SUPPLEMENTARY MATERIALS

Table 1. Random effects intercepts in a model fit to VOT

Number of obs: 2900, groups: Word, 94; Speaker, 51

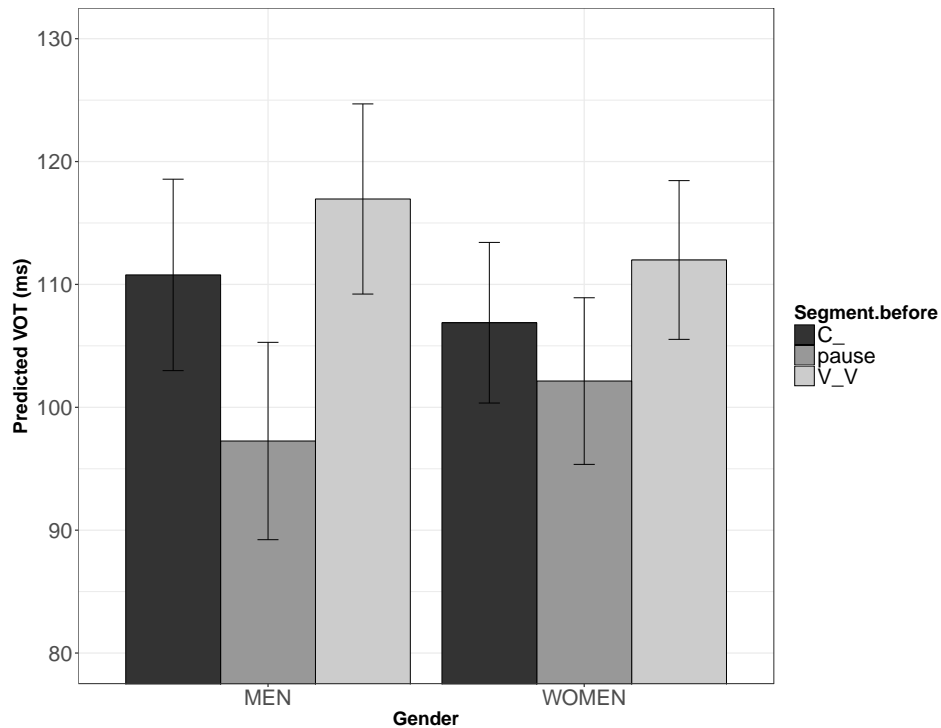| Groups	Name	Variance	Std. Deviation
Word	(Intercept)	115.9	10.76
Speaker	(Intercept)	224.4	14.98
Residual		395.4	19.89

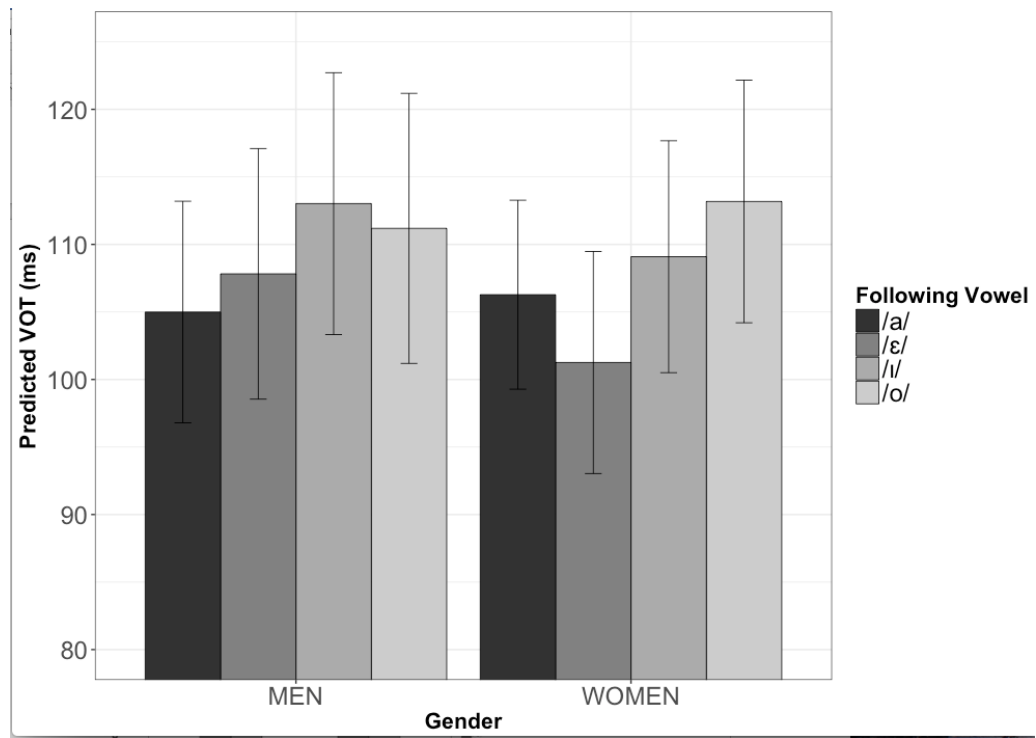Figure 1. VOT by GENDER and PHONETIC ENVIRONMENT
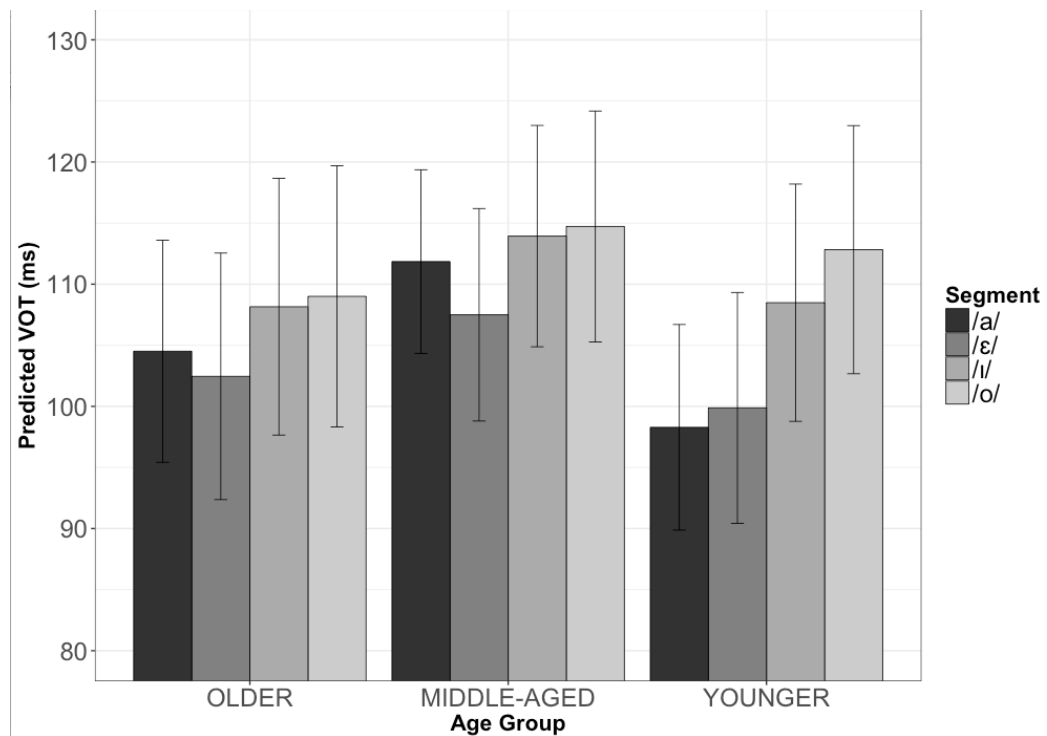
Figure 2. VOT by GENDER and FOLLOWING VOWEL

Figure 3. VOT by AGE and FOLLOWING VOWEL

Table 2. Random effects intercepts in a model fit to CoG

Number of obervations 2822

Groups: Word, 94; Speaker, 51

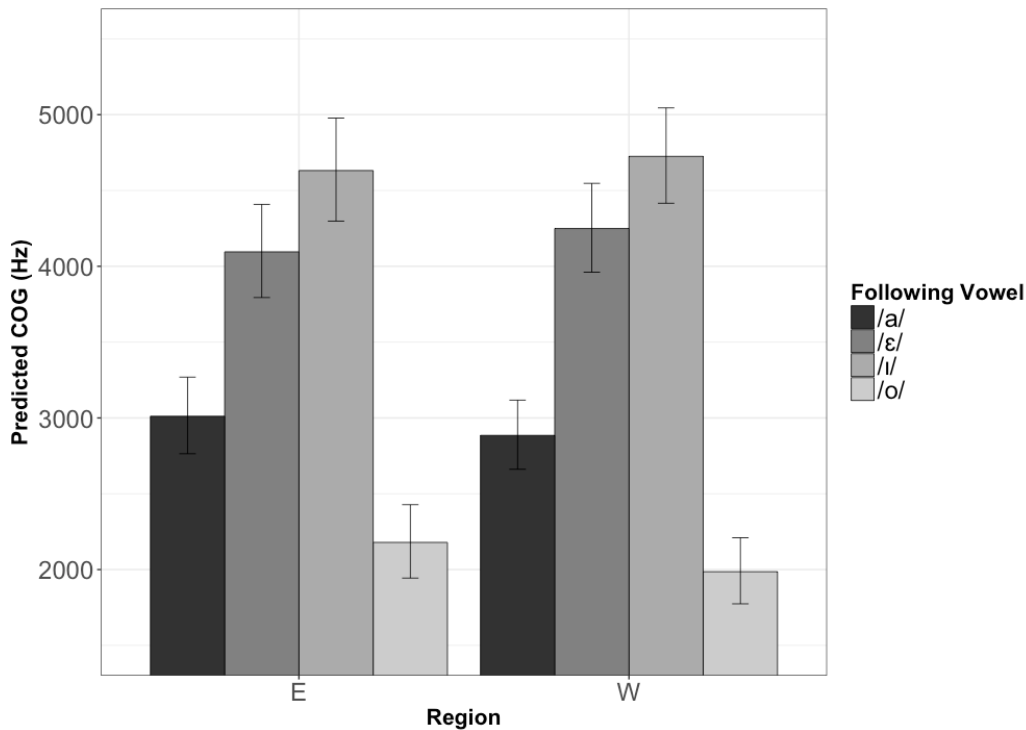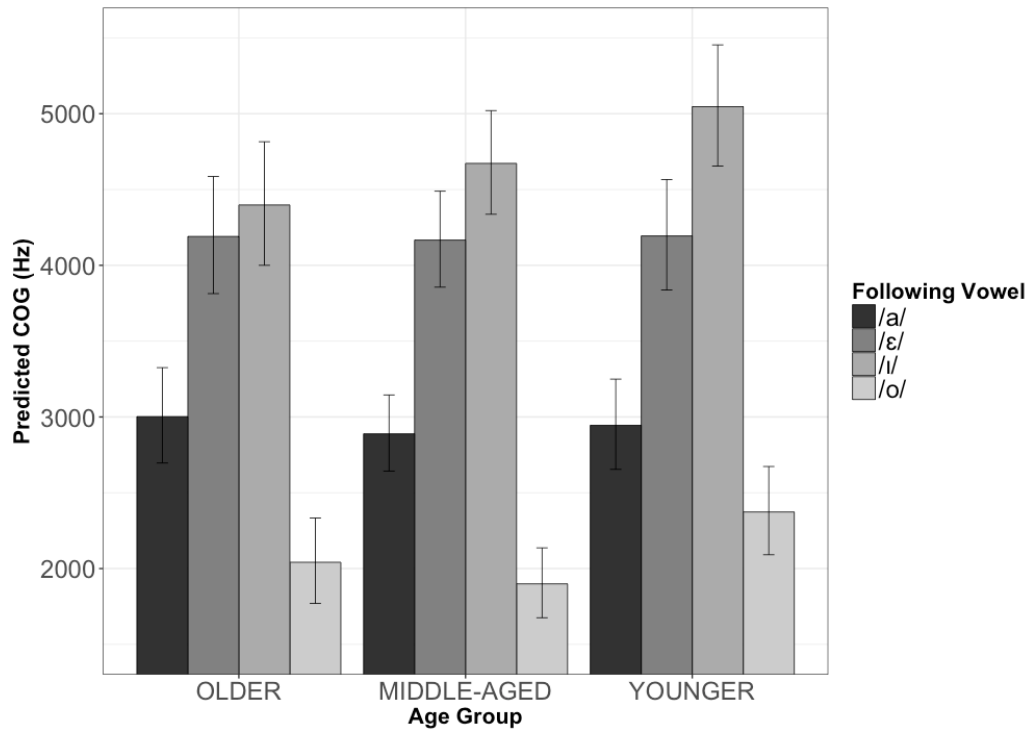| Groups	Name	Variance	Std. Deviation
Word	(Intercept)	2.511	1.59
Speaker	(Intercept)	25.35	5.04
Residual		69.71	8.35

Figure 4. CoG by REGION and FOLLOWING VOWEL
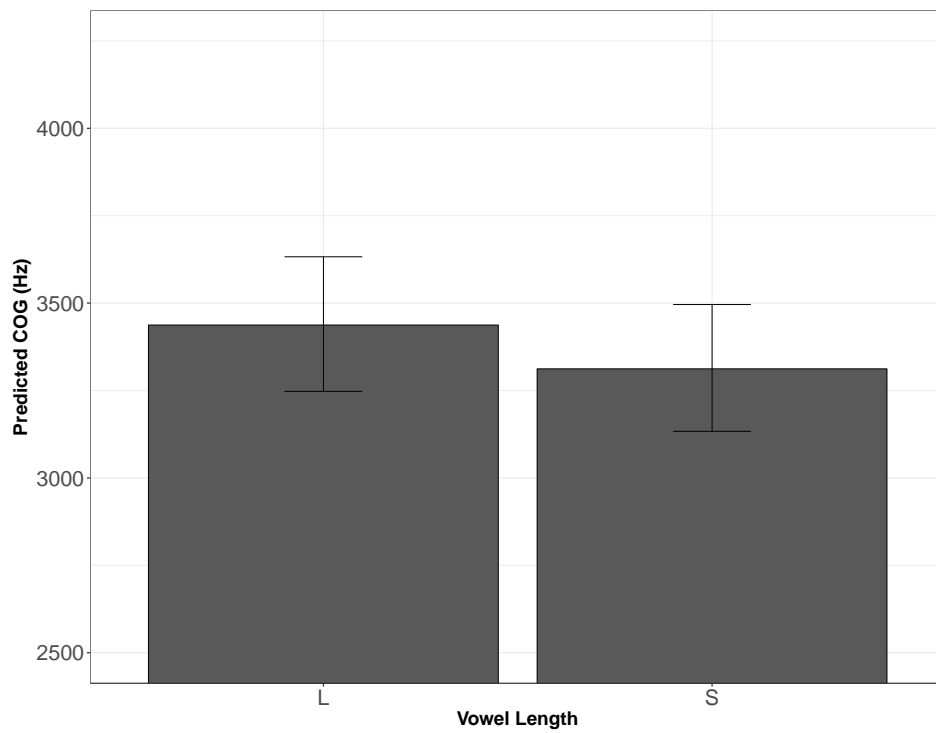
Figure 5. CoG by AGE and FOLLOWING VOWEL

Figure 6. CoG by Vowel Length

Table 3. Random effects intercepts in model fit to CoG with velar fricative

Number of Obervations: 2453

Groups: Word, 62; Speaker, 51

Groups	Name	Variance	Std. Deviation
Word	(Intercept)	3.68	1.92
Speaker	(Intercept)	17.51	4.19
Residual		61.47	7.84

Table 4. Fixed effects coefficients for model fit to square-root transformed CoG values with velar fricative

|		Estimate	t-value	n	Mean CoG sq
INTERCEPT	/kʰ/	51.54	24.84	827	55.80
	Following vowel				
	/a/			576	49.71
	Middle-aged			1035	56.77
	Men			978	53.72
	Eastern			1057	55.61
SEGMENT	**/tʰ/**	-8.27	3.51	1280	58.16
	/x/	5.12	-4.85	346	51.93
AGE	Older	-4.98	-1.81	742	56.71
	Younger	-6.76	-2.56	676	55.81
GENDER	Women	-1.25	-0.66	1475	58.32
FOLLOWING VOWEL	/e/	11.76	7.48	661	64.48
	/i/	17.95	9.53	522	69.12
	/o/	-8.56	-4.66	694	45.00
REGION	**Western**	-6.27	-3.13	1396	57.14
SEGMENT: AGE	**/tʰ/: Older**	-3.44	-4.02	383	57.24
	/tʰ/: Younger	1.13	1.26	352	58.57
	/x/: Older	-2.98	-2.34	100	54.22
	/x/: Younger	-0.7	-0.61	111	49.60
SEGMENT: GENDER	**/tʰ/: Women**	3.53	4.71	771	60.56
	/x/: Women	2.58	2.31	2044	53.06
AGE: FOLLOWING VOWEL	**Older: /e/**	-3.11	-2.85	197	64.10
	Younger: /e/	-0.98	-0.86	174	63.08
	Older: /i/	-4.39	-3.76	156	67.52
	Younger: /i/	0.93	0.77	149	69.89
	Older: /o/	1.59	1.46	214	46.34
	Younger: /o/	2.43	2.14	197	45.45
AGE: GENDER	**Older: Women**	7.91	2.73	482	60.22
	Younger: Women	1.51	0.55	406	57.34
AGE: REGION	**Older: West**	6.88	2.38	383	58.94
	Younger: West	8.11	3.11	403	57.97
SEGMENT: FOLLOWING VOWEL	/tʰ/: /e/	-1.06	-0.56	317	66.51
	/tʰ/: /i/	-3.42	-1.65	271	70.49
	/tʰ/: /o/	-0.46	-0.22	465	47.33
	/x/: /e/	14.63	5.26	66	69.81
	/x/: /i/	8.60	2.96	48	73.30
	/x/:/o/	5.40	1.86	74	41.24
REGION: FOLLOWING VOWEL	**West: /e/**	2.80	2.99	376	65.74
	West: /i/	2.40	2.41	308	70.01
	West: /o/	0.10	0.10	392	45.26
REGION: SEGMENT	**West: /tʰ/**	1.61	2.15	699	59.15
	West: /x/	2.48	2.21	223	52.50
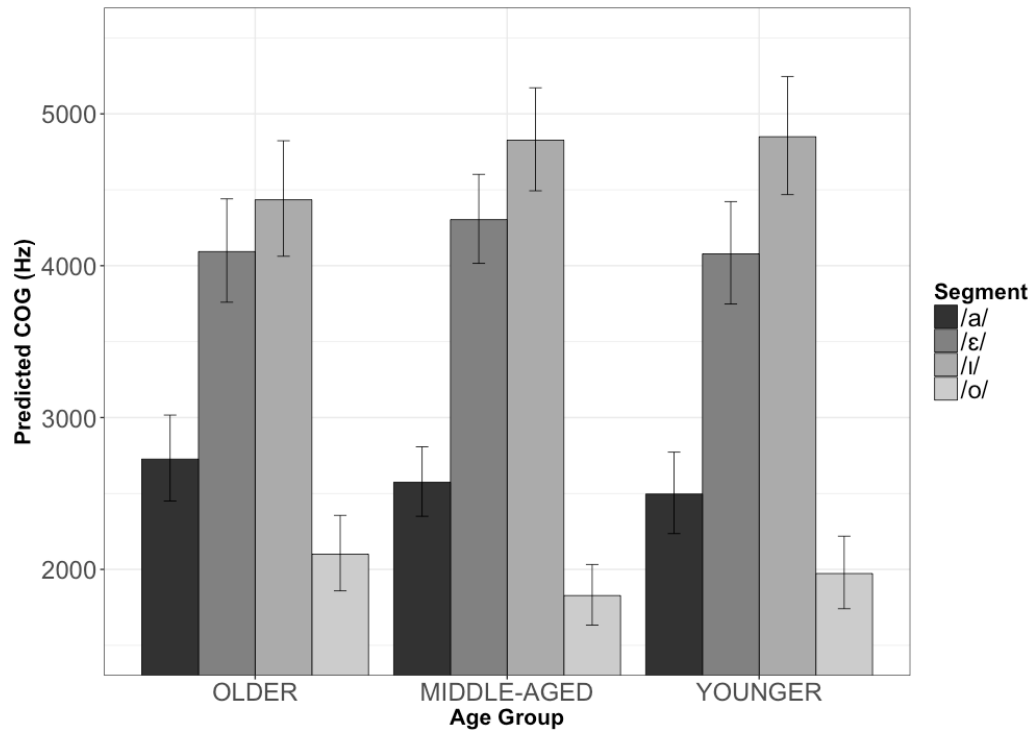
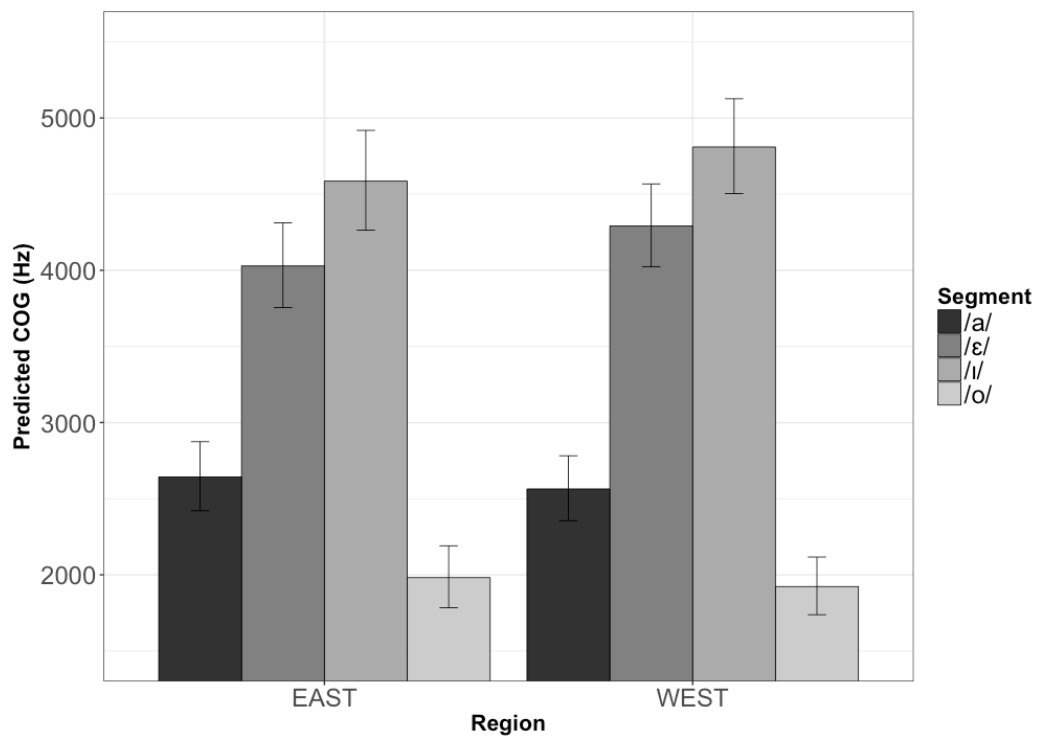Figure 7. CoG by Age and Following Vowel

Figure 8. CoG by Region and Following Vowel
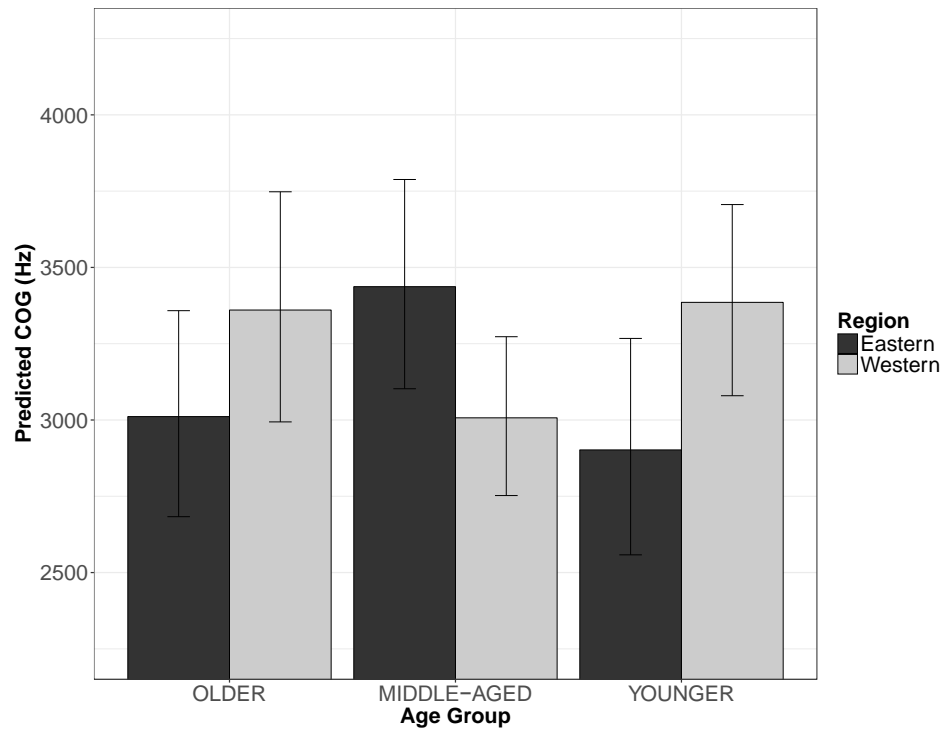
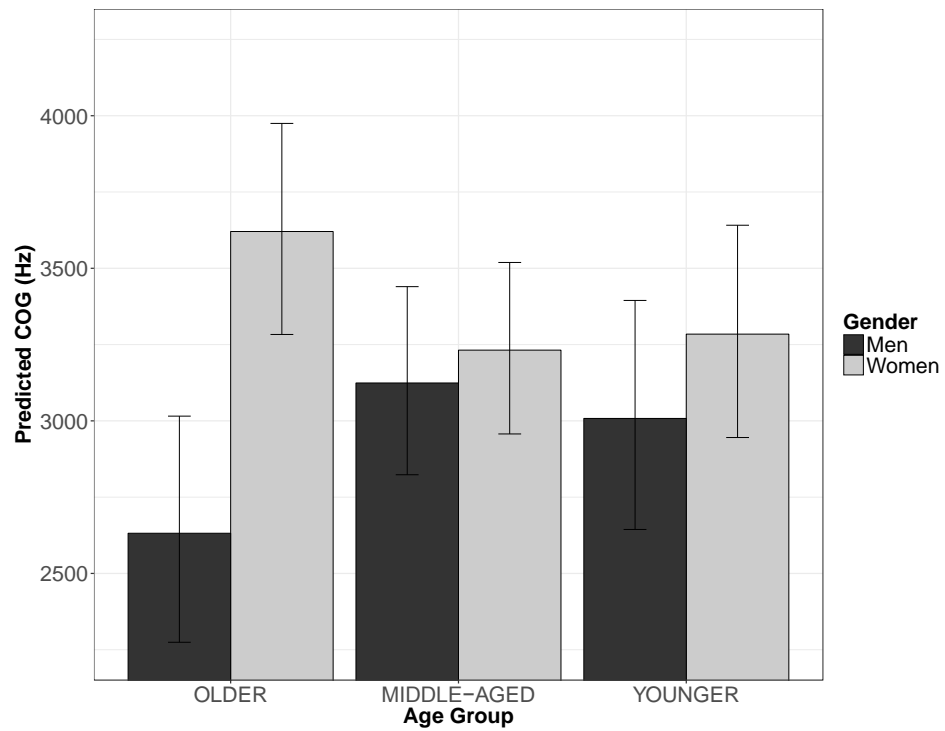Figure 9. CoG by Age and Region

Figure 10. CoG by Age and Gender

APPENDIX 5: CHAPTER 5
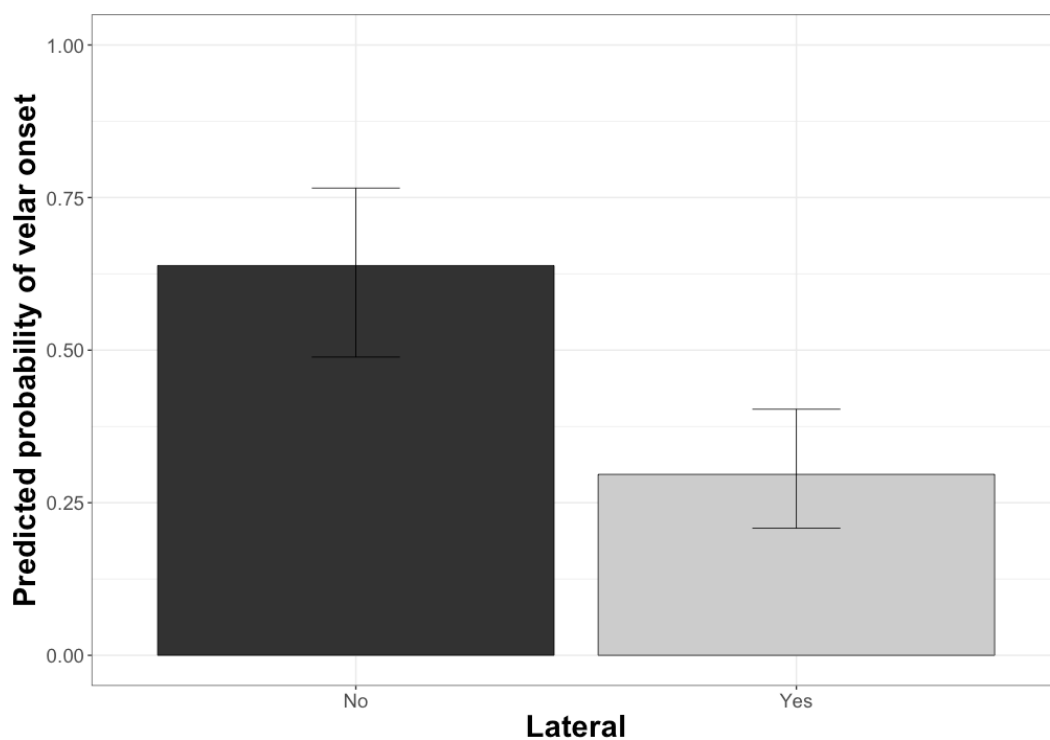
SUPPLEMENTARY MATERIALS

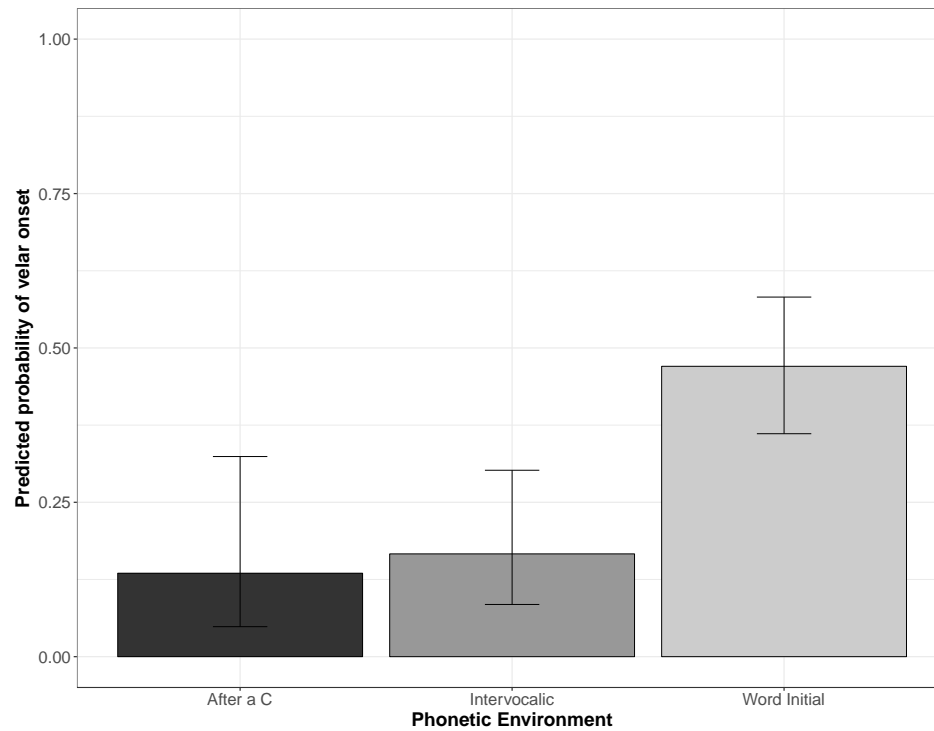

Figure 1. Velar Onsets by lateral release

Figure 2. Velar onsets by phonetic environment

Table 1. Random effects for glmer model fit to ejective onsets

Number of observations: 520
Groups: Speaker, 51

Groups	Name	Variance	Std. Deviation
Speaker	(Intercept)	1.54	1.24

APPENDIX 6: CHAPTER 6

SUPPLEMENTARY MATERIALS

Table 1. Random effects for model fit to *nít'ę́ę́'*

Number of observations: 1245

Groups: Speaker, 50

Groups	Name	Variance	Std. Deviation
Speaker	(Intercept)	0.99	0.99

Table 2. Logit values for model fit to *nít'ę́ę́'*

		Estimate	z-value
INTERCEPT	No *nít'ę́ę́',* imperfective mode, no dependent verb	-1.12	-5.32
VERBAL MODE	Iterative/Usitative	-0.02	-0.06
	Other	-0.41	-0.49
	Perfective	-1.18	-5.83
	Progressive	-0.87	-1.45
DEPENDENT VERB	Yes	-2.36	-7.75

APPENDIX 7: LEXICAL

VARIATION

Table 1. List of lexical variants from interviews

Variant 1	Variant 2	Young and Morgan 1987	Gloss
t'áálá'í	'áál'á'í	t'áálá'í	'one'
łichxíí'	łichíí'	łichíí'	'red'
wádzo ch'ééh déyá	t'óó wáhádzogo ch'ééh déyá	t'óó báhádzidgo ch'ééh déyá	'I am very tired'
gohwééh	'ahwééh	gohwééh ~ 'ahwééh	'coffee'
nishłį́	nishłǫǫ	nishłį́į=go	'I am (clan, career)'
chidítsoh	chogí biką'	chidítsoh, bikée'jį' 'adeez'áhí	'truck, pickup'
ta'neesk'ání	da'neesk'ání	ch'ééh jiyáán (~t'ééhjiyáán)[57]	'melon'
nímasii	nímazii	nímasii	'potato'
Ta'neeszahnii dashizhé'é	Ta'neeszahnii báshíshchíín	Ta'neeszahnii báshíshchíín	'I am born for the Tangle-People clan'
hosghaal	hodiwol	hodiwol	'bumpy (road)'
chaha'oh	chahash'oh	chaha'oh, chahash'oh	'shade house'
bidá'	'adá'	yílk'id, dah násk'id	'hill'
'áłch'į́į́díi yee'	'áłts'ísí	'áłts'ísí~'áłts'íísí t'áá 'áłch'į́į́dígo 'a little bit'	'little'
yinishyé	wonishyé	yinishyé	'my name is'[58]

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[57] Thank you to Lorene Legah for pointing out this variant.

[58] There is also a related variant: *dashijiní* 'they call me' (Lorene Legah p.c.)

Variant 1	Variant 2	Young and Morgan 1987	Gloss
dzạ̹ạdi	kodi	dzạ̹ạdi, kwe'é	'here'
bíla'tá'í	bíla'dį'ii	bíla'táa'ii~ bílatá'í 'three-pronged fork' bíla'dį'ii 'four-pronged fork'	'fork'
tó dilchxoshí	tóildoní	tó dilchxoshí	'soda'
'iishkeed (click of camera)	be'eshłééh 'I copy him'	'iishkeed, naaltsoos bik'i ninishteeh	'I photograph him'
náneeskaadí ~ daneeshkaadí	bidiich'iłí (seared bread)	náneeskaadí	'tortilla'
jaa'í	daa'í	jaa'í, daa'í, gohwééh bee yibézhí	'coffee pot'
t'óó wáházigo	t'óó wáhádzo	'ayóo, 'ayóigo, t'óó báhádzigo, t'óó báhádzidgo	'extremely'
tó nílínígíí	tó	tó	'water'
níłch'i nlínígíí	níłch'i	níłch'i	'air'
dichin biiłhe' 'to die of hunger'	dichin nissin	dichin nishłį́	'I'm hungry'
shígish	shégish	shégish	'I cut it'
gódí	naa'ahóóhai ~ na'ahóóhai	naa'ahóóhai	'chicken'
shich'ó	sitsóí (maternal), shinálí (paternal)	sitsóí (maternal), shinálí (paternal)	'my grandchild'
taa'niil	tóshchíín	taa'niil	'porridge'[59]
'adóola	dóola	dóola	'bull'
hábízhí	hazeedí, sizeedí	See d856 for variants	'cousin (older term)'
tsííkáá' sit'éhé	łees'áán biyaa naayolí	łees'áán	'bread made over embers'[60]
doo 'áhályą́ą da	wa'aah	diigis	'crazy'

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[59] The consistency of the porridge may vary with the use of different terms (Lorene Legah p.c.).

[60] There is also the variant: *dzizésí* (Lorene Legah p.c.)

Table 2. Examples of regional lexical variants from interviews

Eastern Form	Western Form	Young and Morgan 1987	Gloss
bikooh	cháshk'eh	bikooh (canyon)	'big dip'
mású	mósí	mósí, mású	'cat'
tsís'ná	tsés'ná	tsís'ná	'bee'
zas	yas	yas, zas	'snow'
Dook'o'oosłííd	Náá'k'o'oosłííd	Dook'o'oosłííd	'San Francisco Peaks'
biya 'adéłtí'	nániichxaad	nániishcháád (IPFV), nániichaad (PFV)	'I am full'
baa ntséskę̄ęs	baa ntséskees ~ nitséskees	baa ntséskees	'I think about it'
kéłichíí'	kélchí	kélchí	'moccasins'
dích'íí'	sidó'	dích'íí'	'spicy'
tółich'íí'í ~ tółch'íí'í	tó dilchxoshí ~ tó łikaní	tó dilchxoshí	'soda'
sindáo	łichí'í	t'ááłá'í sindáo	'penny'[61]
tá'ádísgis	naashbé	naashbé	'I take a bath'
tsídzí'	dzidzí'	tsídza, dzídza	'into the fire'

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[61] There is a Northern variant *yáál*.