Yours, Mine & Ours: What Ancient Egyptian Possessives Can Tell Us About Language Change and Stable Variation

by

Shayna Gardiner

A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
Graduate Department of Linguistics
University of Toronto

© Copyright 2017 by Shayna Gardiner
Abstract

Yours, Mine & Ours: What Ancient Egyptian Possessives Can Tell Us About Language Change and Stable Variation

Shayna Gardiner
Doctor of Philosophy
Graduate Department of Linguistics
University of Toronto
2017

Natural language variation can be thought of as two or more variants competing for use (Kroch 2001, 1989). Under this model, two outcomes are possible: language change or specialization. Specialization can be then broken down into specialization for different functions, and partial specialization – stable variation (Wallenberg 2013; Fruehwald and Wallenberg 2013).

In this historical sociolinguistic investigation, I analyze differences between stable variation and language change in Ancient Egyptian. Observing two Egyptian possessive variables – clitic possession and nominal possession – I compare factors affecting variant choice in each, using a dataset with a total of 4,656 possessive tokens and 495 demonstrative tokens. I use a theoretical syntactic account to make testable predictions about language change and to inform my choice of continuous factor, which provides the mechanism for stable variation (Wallenberg 2013; Fruehwald and Wallenberg 2013) – in this case, phrase complexity.

Using distributional results, logistic regression, and logistic curves, I find that clitic possession is an instance of language change. I then combine results for demonstrative tokens with a theoretical syntactic account to explain the emergence of the innovative variant in clitic possession, and use logistic regression and conditional inferences trees to illustrate the spread of this variant across Egypt over time. I also find that possessum and text type have an effect on clitic possessive variation, supporting Egyptology-based predictions of stigmatization of the innovative variant, but providing evidence against Egyptological claims of an alienability split for this variable. Phrase complexity has an effect on clitic possession as well, perhaps the reason for the slowness of this particular language change.

Conversely, I find that nominal possession is an instance of stable variation. Possessum and possessor interact in their effect on nominal possessive variation, an effect which provides an understanding of the social meaning attached to the nominal possessive variants: one for high-status nouns, one for other types of nouns. Effects of text type and location are also present in nominal possession, but minimal.
Phrase complexity is a significant factor as well, constraining variation along a continuum and supporting the claim that a continuous factor is the reason for stable variation.
DEDICATION

For Wepwawet, who opened the way; and Thoth, who gave me the words.
Acknowledgements

First and foremost, I want to acknowledge the support and guidance given to me by my advisor, Naomi Nagy, and by my committee members Elizabeth Cowper, Ron Leprohon, Sali Tagliamonte, Aaron Dinkin, and Ann Taylor. I hope that the high caliber of scholarly advice that I’ve received from each of them is evident in this work.

Naomi has been my greatest supporter throughout my doctoral career; she has been my advisor, my teacher, my mentor, and my friend. Under her thoughtful guidance, I have gone from stumbling doctoral student, to doctoral candidate, to PhD, and I hope that I have made her proud with this dissertation. Elizabeth has been a wonderful professor and a great help, always there to answer any of my questions, no matter how foolish. I have thoroughly enjoyed our time drawing syntax trees and discussing politics; the advice I’ve received from her during these talks will stay with me, and I hope that my syntactic abilities here are able to sufficiently demonstrate all she has taught me. Ron has been my guide in my foray into Egyptology; his kindness and patience as I learned the basics of the field have been immeasurable. Eminent knowledge about all the ancient texts used in this work, his love for Ancient Egyptian writing has inspired me, and I hope that my own love for these stories, letters, and prayers is evident here as well. Sali’s knowledge and instruction throughout my study of sociolinguistics have been extremely beneficial in my growth as a linguist, and her enthusiasm for all sociolinguistic stories and their telling has made me a better scholar. Aaron’s and wit and insight have also been invaluable throughout my sociolinguistic career; his thoughts have always provided me with perspectives I might not have otherwise considered. Ann’s advice, too, has been illuminating, thoughtful, and instrumental in the creation of this final version of my dissertation.

There are many other scholars who deserve my thanks as well. To Rob Truswell, for teaching me LaTeX and syntax, and for telling me to never stop being a linguist; to Shana Poplack, for introducing me to sociolinguistics; to Charlotte Reinholtz and Hitay Yukseker, for convincing me to major in linguistics in the first place. I would also like to thank David Adger, Jack Chambers, Alex D’Arcy, Josef Fruehwald, Ruth Kramer, Zoe McQuinn, Panayiotis Pappas, Suzanne Evans Wagner, and Joel Wallenberg for their support of my work – I have often received encouraging comments from them, which have inspired me to continue on in linguistic research. Thanks as well to my Egyptology crew, Justin Charlick, Thomas Greiner, and Carla Mesa-Guzzo – em hotep, my friends. Thank you to all the members of the LGCU, former and present, whom I had the pleasure of knowing – special thanks to Marisa Brook, Derek Denis, Matt Hunt-Gardner, Lex Konnelly, and Ruth Maddeaux for their astute insights on my work. Thank
you also to various members of my Queen’s posse: Laurence Garrick-Ewans, Mariam Hai, Graeme McDowell, and Naomi Metcalfe – without your humour, fun, and friendship I could not have completed this dissertation.

I would be remiss if I did not also thank my unofficial corporate sponsor, Lululemon Athletica, who have provided me with clothing for running, dancing, teaching, conferencing, and writing. I would like to thank my Lulu family as well, for whose encouragement I’m very grateful.

Additionally, I would like to express my heartfelt thanks to that warmest of beverages, that which brews in hot water, rouser of the somnolent, glorious soother of souls: tea. I would not have been able to complete this dissertation without tea. Special thanks to my main provider of tea, David’s Tea.

Thank you also to the Ancient Egyptian people: I could not have written this dissertation had they not been such prolific writers. They strongly believed that words and stories have power; I am honoured to be able to tell those stories, and to breathe life into their words once again.

Finally, the most heartfelt thanks go to my family, whose encouragement of my academic pursuits never wavered. To my mother, Ida Gardiner, who allowed me to be whatever I wanted, whose own strength gave me mine. Her creativity has always inspired me, and her love of language shaped my own. To my father, Ed Gardiner, who instilled in me a love of history, science, and discovery. His quiet support of my dreams has given me the heart and the means to finish this dissertation. To my grandfather, Basil Brown; I hope that my use of his gift to complete my doctoral degree would have made him proud. To my great aunts, Kaye Mulligan, Marie Doheny, and Bernadette Brewer, who always understood my love of learning. To my aunt, Kathleeen Gardiner, without whose sage doctoral counsel I would be lost. To my brother, Jamie Gardiner, who is always there for me and unfailingly proud of me. To my family at Lake Dore, who gave me a love of adventure – whether it be exploring caves, or exploring knowledge. To my cat and dog, whose fuzziness and love has comforted me and kept me warm while writing.

Most of all, thank you to my husband, Dan DiMillo, who has been with me through the entire doctoral process. No words can express my gratitude; his steadfast encouragement and love have given me more than he knows.
# Contents

Acknowledgements ...................................................... v

Table of Contents ..................................................... vii

List of Figures ........................................................ x

List of Tables ......................................................... xii

1 Introduction .......................................................... 1

1.1 Ancient Egypt: Time Depth ........................................... 6

1.1.1 United Egypt: The Two Lands .................................. 6

1.1.2 Egyptian Language & Writing ................................... 8

1.1.3 Egyptian Language in Society .................................. 10

1.2 Language Change & Natural Variation ......................... 14

1.2.1 Language Change .................................................... 15

1.2.2 Stable Variation ..................................................... 20

1.2.3 Lifespan Change ................................................... 21

1.2.4 The Continuity Hypothesis ..................................... 22

1.3 Meta-Analysis of the Effect of Continuous Factors ........... 24

1.3.1 Meta-Analysis Methods .......................................... 25

1.3.2 Meta-Analysis Results .......................................... 27

    Stable Variables .................................................. 27

    Language Change Variables ..................................... 27

    Status Unknown: Making Predictions .......................... 29

1.3.3 Discussion ....................................................... 30

Using Social Factors .................................................. 30
2 The Syntactic Connection

2.1 The Distribution of the Variants

2.1.1 Demonstratives & the Definite Article

2.1.2 The Construct State Construction: sī r & pr.f possessives

2.1.3 Clitic Possessors & pī Possessives

2.1.4 Adjectival Possession: The nisbe Possessive

2.2 Analysis

2.2.1 Egyptian Possession in the Literature

2.2.2 The Syntax of Possessives

2.2.3 Determiner Phrases

2.2.4 Demonstrative Phrases

The Pre-Nominal Demonstrative: A Syntactic Reanalysis

2.2.5 Construct State Constructions: The sī r Possessive

More Construct States: The pr.f Possessive

2.2.6 The pī Possessive: A Full Determiner

2.2.7 Adjectival Possession: The nisbe Possessive

2.3 Summary

3 Methods

3.1 Data Sources

3.2 Token Extraction

3.2.1 Other Exclusions

3.2.2 Summary

3.3 Possessum and Possessor Effects in Genitive Variation: A Cross Linguistic Background

3.4 Understanding Noun Categories in Egyptian: The Dhutmose Letters

3.4.1 The Dhutmose Letters

Creating Noun Category Factor Groups

Summary

3.5 Coding Other Factor Groups

3.5.1 Nominal Possession
4 Results

4.1 The Constant Rate Effect: Clitic Possession is a Typical Change Variable

4.2 The Rise of $p$: Variation in Clitic Possession & Demonstratives

4.2.1 Demonstratives: The Origins of $p$

4.2.2 Clitic Possession: Language Change

4.2.2.1 Mapping the Spread of $p$ Possessives

4.2.2.2 Alienability & Animacy

4.2.2.3 Complexity & The Continuity Hypothesis

4.3 Nominal Possession: Stable Variation

4.3.1 Measuring Stability

4.3.2 Noun Type and Text Type

4.3.3 The Continuity Hypothesis: Comparing Phrase Complexity

5 Discussion & Conclusions

5.1 Background Components

5.1.1 Predictions

5.2 Comparing Variables

5.2.1 Change Over Time: The Rise of $p$

5.2.2 Stability Over Time: Nominal Possession

5.2.3 The Effects of Noun Type

5.2.4 Text Type: The Surprising Influence of Fairy Tales

5.3 Complexity: The Continuity Hypothesis

5.4 Conclusions

References
List of Figures

1.1 Map of Ancient Egypt (Kerr 2008) ......................................................... 7
1.2 Timeline of Egyptian historical periods to be studied in this paper, and the language stages encompassing them .............................................. 9

4.1 Logistic curves modelling the rate of increase of \( p \) possessives over time in each of the three text types. Slopes were compared via ANOVA; \( F = 0.027, DF = 8, p = 0.97 \) ........ 119

4.2 Conditional inference tree visualizing the spread of \( p \) demonstratives across Egypt over time. LE = Lower Egypt; UEN = Upper Egypt North; UES = Upper Egypt South. OK = Old Kingdom; MK = Middle Kingdom; NK = New Kingdom. \( p \) demonstratives are represented by grey bars; \( pn \) demonstratives are represented by black bars .......... 123

4.3 The distribution of \( p \) demonstratives and \( pn \) demonstratives in each text type and time period ............................................................... 125

4.4 Conditional inference tree visualizing the percentage of \( p \) possessives by provenance over time. LE = Lower Egypt; UEN = Upper Egypt North; UES = Upper Egypt South. D. = Dynasty. \( p \) possessives are represented by grey bars; \( pr.f \) possessives are represented by black bars .............. 130

4.5 Conditional inference tree visualizing the percentage of \( p \) possessives by provenance and text type. LE = Lower Egypt; UEN = Upper Egypt North; UES = Upper Egypt South. \( p \) possessives are represented by grey bars; \( pr.f \) possessives are represented by black bars. 131

4.6 Conditional inference tree visualizing the percentage of \( p \) possessives by text type and possessum category. \( p \) possessives are represented by grey bars; \( pr.f \) possessives are represented by black bars. ......................... 135

4.7 Number of \( p \) and \( pr.f \) tokens by complexity score ................................. 136

4.8 Conditional inference tree visualizing the combined effects of noun type and text type. Grey bars represent \( nisbe \) possessives (\( nj \)); black bars represent \( s \) or \( r \) possessives (\( sa \) ........ 142
4.9 Number of $s$, $r$, and $nisbe$ tokens by complexity score. . . . . . . . . . . . . . . . . . . . . . 144
4.10 Number of $p$, and $pr.f$ tokens by complexity score. . . . . . . . . . . . . . . . . . . . . . 145
List of Tables

1.1 Stable variables and factors studied. Potentially continuous factors are in italics; the factor modelled as continuous is in bold. ............................. 28
1.2 Stable and change variables with continuous factors (excluding style). ................. 30
3.1 Dhutmose’s use of each possessive variant over time. ................................. 87
3.2 Dhutmose’s possessive use by year and recipient. ................................. 89
3.3 Dhutmose’s letters to Butehamon by year. ................................. 89
3.4 Dhutmose’s overall nominal possessive use by possessum type. ......................... 93
3.5 Dhutmose’s nominal possessive use by possessum category for letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep. ......................... 94
3.6 Dhutmose’s overall nominal possessive use by possessor category (note the three tokens with pronominal possessors – these are non-clitic forms of the personal pronouns, and this was only seen with the 1PL and 1SG pronouns). There were no possessors in Dhutmose’s letters that were family members (e.g. ‘the brother of the mother’). ......................... 94
3.7 Dhutmose’s nominal possessive use by possessor category for letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep. ......................... 94
3.8 Dhutmose’s overall clitic possessive use by possessum category (note that, in Dhutmose’s letters, no royalty-related nouns were used with pronominal possessors). ......................... 95
3.9 Dhutmose’s clitic possessive use by possessum category for all letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep. ......................... 95
3.10 Dhutmose’s overall clitic possessive use by phi features of possessor. Note that there were no 2FSG possessors in the sampling of Dhutmose’s letters obtained. ......................... 95
3.11 Dhutmose’s clitic possessive use by possessor category for letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep. ......................... 96
3.12 Distribution of possessor and possessum by noun category. ......................... 97
3.13 The distribution of possessum category in clitic possessives. .......................... 98

4.1 Distributional results for clitic possessives for dynasty and text type. ................. 117
4.2 Cross-tabulation of clitic possessive tokens by time period in each text type. ....... 118
4.3 Distributional results for demonstratives by independent variable. ....................... 121
4.4 Demonstrative tokens by time period in each location. ...................................... 121
4.5 Significant factor groups for demonstratives. The pn variant was the application value. 124
4.6 Demonstrative tokens by time period for each text type. ................................ 124
4.7 Distributional results for clitic possessives by social factor group (independent social variable). ................................................................. 126
4.8 Distributional results for clitic possessives by linguistic factor group (independent linguistic variable). ................................................................. 127
4.9 Cross-tabulation of clitic possessive tokens by time period in each location. .......... 128
4.10 Significant factor groups for clitic possessives. The pr.f variant was the application value. 129
4.11 Cross-tabulation of clitic possessive tokens by time period in each text type – excluding tokens of unknown provenance, and combining Dynasties 19-20. ......................... 132
4.12 Cross-tabulation of clitic possessive tokens by possessum category in each text type. . 134
4.13 Distributional results for nominal possessives by social factor (independent social variable). 137
4.14 Distributional results for nominal possessives by linguistic factor group (independent linguistic variable). ................................................................. 138
4.15 Cross-tabulation of nominal possessives by possessum category for each possessor category. 138
4.16 Significant factor groups for nominal possessives. The s3 r* possessive was the application value. ................................................................. 139
4.17 Nominal possessives by dynasty. ................................................................. 139
4.18 Cross-tabulation of nominal possessives by dynasty in each location. Tokens of unknown geographic origin are not included (N = 247). ................................ 141
Chapter 1

Introduction

All languages have within them natural variation – two or more ways of saying the same thing (Labov 1972: 271) – and likewise all languages change over time. These two linguistic phenomena, language variation and change, are the basic elements that variationist sociolinguistics was created to investigate. Since its beginnings in the 1960s, research in this field has furthered our understanding of language in context, illuminating the ways in which the social and the linguistic affect language variation. By observing these contextual social and linguistic factors, researchers have provided us with insight into the path to language change.

It is my goal to continue these traditions: this dissertation not only follows in the variationist, sociolinguist footsteps of many scholars, but also expands the horizons of sociolinguistics by applying variationist methodology to a language and set of variables which have not seen previous sociolinguistic study: morphological variation in Ancient Egyptian possessive constructions. There were three major questions I sought to answer by producing this work:

1. How can stable variation be distinguished from variation that leads to language change?

2. Is it possible to predict whether a given variable will remain stable, or lead to change over time?

3. Does data from 4,000 years ago and halfway across the world behave the same way as the modern English that has been the focus of most variationist analysis?

In order to address these questions, I required an appropriate language, a set of variables, and the necessary background information to address and compare the variation in each variable. These necessities can summarized into four major components:
1. Time depth: in order to be sure that the stable variable is indeed stable, a long period of time is required.

2. Meta analysis: this situates the Egyptian stable variable in the context of other well-studied stable variables and how they behave.

3. Comparing change and stable variables: the bulk of the study. Investigating Egyptian possessives allows for comparison of the stable possessive variable with the language change possessive variable.

4. Necessary preliminary investigation:
   
   (a) syntactic analysis: making predictions based on structure
   
   (b) alienability and animacy study: showing variation and creating factor groups
   
   (c) constant rate testing: demonstrating that the change variable is typical

Time depth is necessary for any investigation comparing stable variation to language change; a lengthy timespan over which to observe stable variation provides us with a relative amount of certainty that the chosen stable variable is, in fact, stable. Ancient Egyptian is perfect for such a study: being the longest continually-attested language in the world (Allen 2013: 1), it has more than the amount of time depth needed. Since the Uniformitarian Principle states that “the forces operating to produce linguistic change today are the same kind and order of magnitude as those which operated in the past five or ten thousand years” (Labov 1972: 275), using data from an ancient language is just as appropriate as using data from a modern one. Indeed, choosing an ancient language allows for testing modern hypotheses and methods on more varied language data than would using modern languages alone, thereby providing additional weight to any hypotheses and theories which are supported by these data.

Second, while variation leading to language change has been investigated thoroughly and is well-understood, stable variation remains an understudied phenomenon that is not particularly well-understood. Therefore, I also provide an investigation into stable variation in the context of the field of sociolinguistics, mainly in the form of a meta-analysis conducted on other, well-known stable variables. This helps to situate my own work on stable variation in the broader context of study, highlighting the unique contributions of this project.

The change and stable variables I have chosen for comparison are illustrated in the sets of examples that follow.\footnote{All examples are taken from my token set, with the exception of those from Allen (2010), Hoch (1997), and Gardiner (1957).} There are several names for each variant and each variable in both linguistics and Egyptology. Many of these terms were so similar as to cause confusion in distinguishing each variant of
each variable, so I have provided my own set of labels that transcend both fields and that make each variant easily distinguishable from the others. My stable variable is nominal possession, while my change variable is clitic possession; there are two nominal possessive variants and two clitic possessive variants. An investigation into demonstrative variation is included as well: it is my proposal that the innovative $p$ variant of the demonstrative is the reason for the emergence of the innovative $p$ variant in clitic possession.

(1) a. тw h†h†
   breath.MSG fire.MSG
   ‘breath of fire’  
   (Baer 1988: 4,1)

   b. тw n(j) ’nh
   breath.MSG life.MSG
   ‘breath of life’  
   (Wente 1990: 3,1)

(1) illustrates each variant of the stable variable, nominal possession. The $s\ r$ possessive (conventionally pronounced ‘sa ra’) is comprised of noun + noun, in the order possessum + possessor. Its label arises from a very popular version of this construction, the $s\ r$ (‘son of Ra’) name, one of the many titles given to the king of Egypt. The second variant maintains the same possessum + possessor word order, but a possessive $nisbe$ adjective intervenes – hence the label, $nisbe$ possessive. It is my prediction that nominal possession should be stable over time: while not overtly discussed as stable variation, there is no mention in the Egyptological literature of either the $nisbe$ or the $s\ r$ replacing its counterpart to any extent over time.

(2) a. pr=f
    house.MSG=3MSG
    ‘his house’  
    (Leitz 1999: 3,16)

    b. py.f pr
    MSG.DEM=3MSG house-MSG
    ‘his house’  
    (Suys 1934: 1,4)
Chapter 1. Introduction

The examples in (2) represent each variant of the change variable: clitic possession. The old form is illustrated in (2-a), the pr.f possessive (conventionally pronounced ‘pear eff’). This variant maintains the possessum + possessor word order of the nominal possessives, with the only difference here being that the possessor is a clitic. The innovative form is shown in (2-b), the ppossessive (conventionally pronounced ‘pa’). Its order is demonstrative + possessor + possessum, where the possessor is also a clitic. The variation between p and pr.f variants is described by Egyptologists as a change in progress: it is made clear by the Egyptological literature that by the time of Coptic, the last stage of the Egyptian language, the pr.f possessive has been all but replaced by the ppossessive (Allen 2013, 2010; Egedi 2010; Loprieno 1995; Hoch 1997; Gardiner 1957). The preliminary results of the variationist pilot studies in Gardiner (2015b) and Gardiner (2015a) also find that clitic possessive variation is change over time, with ppossessives replacing pr.f possessives – although this occurs at a glacial pace, requiring almost three millennia from ppossessives’ emergence to their near-complete replacement of pr.f in Coptic (Gardiner 2015a,b; Allen 2013, 2010; Egedi 2010; Loprieno 1995; Hoch 1997; Gardiner 1957).

(3) a. hrw pn
day.MSG MSG.DEM
‘this day’
(Leitz 1999: 3,16)

b. p y hrw
MSG.DEM day.MSG
‘this day’
(Suys 1934: 1,4)

Finally, the demonstrative variants are illustrated in (3). The old form of the demonstratives is the pn demonstrative (conventionally pronounced ‘pen’), shown in (3-a). As with clitic possession, the p variant is the innovative form in demonstratives as well. It is shown in (3-b).

Since Egyptian possessives specifically have not been thoroughly investigated through a variationist, sociolinguistic lens, in the chapters that follow I also provide relevant background information illustrating three important findings: a theoretical syntactic analysis of each variant to provide the basis for statistical hypothesis-testing; alienability, animacy, and whether the variables are truly variable; and an analysis of the Constant Rate Effect (Santorini 1992; Pintzuk 1991; Kroch 1989) to illustrate that the change variable behaves typically, and is thus suitable for comparison to the stable variable.

The Constant Rate Effect, which will be discussed further in the sections and chapters that follow,
has been observed in many language change variables across languages (Santorini 1992; Pintzuk 1991; Kroch 1989). Indeed, it is so commonly found in language change variables that it can be said to be a characteristic of language change. Therefore, it is a useful metric to use this effect as a point of reference for whether a change variable behaves in a way that is typical for language change.

The alienability and animacy study is necessary for two reasons. First, because several Egyptological accounts of the possessive constructions under investigation describe them as being split by alienability, the idea being that one variant from each of the two possessive variables occurs only with alienable nouns, with the other variants of each variable occur only with inalienable nouns (Egedi 2010; Kammerzell 2000). A noun’s “alienability” refers to whether it is obligatorily possessed by its possessor: nouns whose possession is obligatory are called inalienable, as they cannot be separated from their possession relationship with their possessor (Nichols and Bickel 2011; Kammerzell 2000; Nichols 1988). Alienability has been found to be relevant in other languages, having an effect on possessive variation in other Afroasiatic languages related to Egyptian, such as Arabic (Boumans 2006; Nichols 1988). Therefore, it is necessary to test this for Egyptian, especially to ensure that the effect is not so strong as to be completely lacking in variation, as claimed (Egedi 2010; Kammerzell 2000); a lack of variation would render a variationist study of these constructions somewhat inconsequential. Second, animacy constraints – categorizing possessa as “animate” or “inanimate” – have been found to have a strong effect on English (Jankowski and Tagliamonte 2014; Rosenbach 2008, 2005; Biber et al. 1999; Ljung 1997) as well as Arabic possessive variation (Boumans 2006; Nichols 1988), so it is necessary to include this as well: as with alienability constraints, if the effect is so strong as to be categorical, then there is no real variation to investigate in this variationist analysis.

These three background components – the theoretical syntactic analysis, the alienability and animacy investigation, and the Constant Rate Effect testing – allow me to move forward with my third component above, investigating and comparing the variation within a stable possessive variable and a changing one.

My syntactic and sociolinguistic analyses of the Egyptian variables constitute the bulk of this dissertation, adding to the available data on stable variation and providing insight into how it behaves in comparison to variation related to language change. My main investigation is therefore comprised of the last two components in the list above: the comparison of stable and change variables, and the information necessary to conduct such a comparison. These will be investigated fully in the next chapters, while the remainder of this chapter focuses on the first two components in the list above: the usefulness of choosing the Ancient Egyptian language, and situating my work in the broader context of stable variation via the meta-analysis.
1.1 Ancient Egypt: Time Depth

This section focuses on the first component of my investigation: time depth. It provides the contexts – chronological, digital, linguistic, and social – in which the data I analyze is embedded, in order to give the reader an understanding of the landscape in which the linguistic variables emerged and existed.

1.1.1 United Egypt: The Two Lands

Egypt is no doubt one of the most famous and influential civilizations of the ancient world. The area that was Ancient Egypt, the fertile land along the Nile, has been inhabited since prehistoric times, and the Egyptian Empire at its height spanned across what is now modern Egypt, west into Libya, south into Sudan, and east into the Levant (Shaw 2009). During the Bronze Age, Egypt was a world power, and its effects on the world are present even today: many aspects of modern Western society, philosophy, and literary traditions can trace their roots back to this civilization (Hornung and Lorton 2001: 1-2).

Ancient Egypt was divided into two parts. The first is Lower Egypt, located in the north, where the Nile reaches its delta (so-called because it is shaped like the Greek letter) into the Mediterranean. The second is Upper Egypt, located in the south, which included the rest of the Nile valley up until the first cataract of the Nile. Further south of this, northward to the first cataract, was known as Nubia, where the native language was not Egyptian but rather an ancestor of Old Nubian, an Eastern Sudanic language (Smith 2003: 56-60). The Egyptian language in Nubia was used largely for administrative purposes and trade; the Egyptians conquered Nubia by force, and Egyptians viewed the Nubians as inferior – likely in part due to their non-Egyptian language (Smith 2003: 56-60). The data for this project come mainly from Upper Egypt and Lower Egypt, but there are also a small number of (Egyptian language) tokens from Nubia.

When Egypt became one of the earliest united nation-states (c. 3100 BC), its two major powers were joined: Upper Egypt and Lower Egypt. The duality and union between Upper and Lower Egypt was prominent for the entirety of Ancient Egyptian history: Egyptians often referred to their country as “the two lands,” and their ruler as “the king of the two lands,” or “the dual king.” This sense of unity combined with emphasis on the fact that these are two separate regions makes comparing the written texts from Upper and Lower Egypt very useful, especially since it is sometimes suggested that the $p\text{\textsuperscript{b}}$ demonstrative and its accompanying clitic possessive were a dialectal feature – though there is no mention of which region it may have come from (Allen 2013). In this dissertation, I search for evidence to support this theory, separating tokens from Upper Egypt South, Upper Egypt North, and Lower Egypt in order to compare them for any differences in usage of the two innovative $p\text{\textsuperscript{b}}$ variants in possessives.
Figure 1.1: Map of Ancient Egypt (Kerr 2008).

Ancient Egyptian history is divided by Egyptologists into several periods: first is the Pre-Dynastic Period, the time before Egypt became united under one king. After this is the Early Dynastic Period, followed by three Kingdoms – periods during which the kingship was strong and stable, and power was centralized with the royal family in their capital city. These are called the Old Kingdom, the Middle Kingdom, and the New Kingdom. In between Kingdoms are Intermediate Periods, more unstable periods during which power became decentralized and divided amongst provincial leaders (nomarchs), or during which Upper and Lower Egypt were ruled by separate kings. For each of the three Kingdoms, there is an Intermediate Period that follows: the First Intermediate Period follows the Old Kingdom and precedes the Middle Kingdom; the Second Intermediate Period occurs between the Middle and New Kingdoms; and demonstratives.
Chapter 1. Introduction

The Third Intermediate Period follows the New Kingdom, and brings with it the end of the Bronze Age and the slow decline of Egyptian influence over the ancient world (Shaw 2009).

I focus here on the time periods during which the innovative variants, the possessive and demonstrative were introduced in writing and began to flourish. Therefore, this work focuses mainly on the Middle Kingdom through to the Third Intermediate Period. There are, however, also a small number of demonstrative tokens from the Old Kingdom and First Intermediate Period.

1.1.2 Egyptian Language & Writing

The Egyptian language is of the Afroasiatic family, related to Semitic and Berber languages, though not a member of either of these sub-categories (Allen 2013: 1). Ancient Egypt was one of the first societies to develop writing – Egyptian hieroglyphic is first attested circa 3250 BC – and Egyptian did not die out until the 18th century AD, making it the longest continually-attested language in the world (Allen 2013: 1-2). Because of the dry, desert climate of Egypt which preserved textual materials like stone and papyrus paper, we have many records spanning the thousands of years of history of the language (Allen 2013: 1). Ancient Egyptian is divided by scholars into five stages: Old Egyptian, Middle Egyptian, Late Egyptian, Demotic, and Coptic. Old Egyptian corresponds to the Early Dynastic Period through to the end of the Old Kingdom, Middle Egyptian to the Middle Kingdom and New Kingdom, Late Egyptian to the New Kingdom, Demotic to the Late Period through Roman Egypt, and Coptic to Byzantine Egypt until the language’s disappearance.

I focus on Middle Egyptian through Late Egyptian: early Middle Egyptian heralds the introduction of possessive and the two linguistic changes we are concerned with (Allen 2010; Loprieno 1995; Hoch 1997; Gardiner 1957). Figure 1.2 illustrates the overlap of my investigated time periods and language stages, showing the language stages as they occur in writing rather than in spoken language; we can only speculate about how people were actually speaking during these periods.

During the timespan being investigated, Egyptian had two written scripts: hieratic and its more famous counterpart, hieroglyphic. While Egyptian is not Semitic itself, being on a separate branch of the Afroasiatic tree, Egyptian scripts have many similarities to Semitic writing systems. For example, just as Arabic and Hebrew vowels are not generally written, neither are Egyptian vowels, whether the script is hieratic or hieroglyphic. Egyptian, like Arabic, is based on a consonantal root system, so Egyptian hieroglyphic uses the mono-, bi-, tri- and quadrilateral roots provided by the language (Gardiner 1957: 25-29). That is, some hieroglyphic signs represent a single consonant, while others may represent a cluster of two, three, or four consonants. Each root can be made into essentially any
Figure 1.2: Timeline of Egyptian historical periods to be studied in this paper, and the language stages encompassing them.
lexical category by adding the appropriate affix(es), generally represented by a single consonant glyph. Because of this, we cannot know for certain what vowels were involved and where, or what Egyptian syllable structure was like. It is possible to speculate to some degree on Egyptian phonology based on the vowels reconstructed for Proto-Afroasiatic, the vowels in Coptic, and the glides $w$ and $j$ (written $i$ in more traditional Egyptian transliterations) (Gardiner 1957: 28-29), but this will not be discussed in this study; I focus only on the morphosyntactic information gleaned from those (consonant) phonemes which are visibly included in the writing system.

Hieratic is a cursive script based on hieroglyphic. As such, hieratic was very useful for Egyptian scribes: it could be written quickly and easily, so it was often found on more common less permanent documents – letters, certain administrative texts like tax reports, and papyrus-roll books for individual enjoyment. Meanwhile, the more painstaking and time-consuming hieroglyphic script was used for permanent texts such as those on temple walls or inside tombs, which were intended to be viewed by the gods and the deceased for all eternity.

Since this project encompasses the end of the Old Kingdom, Middle Kingdom, and New Kingdom up until the Third Intermediate Period, it includes texts written in both hieratic and hieroglyphic. The majority of the texts used in this project were of the kind written on cloth, papyrus, and ostraca, so the majority of them are written in hieratic.²

### 1.1.3 Egyptian Language in Society

Egyptian society was rigid and hierarchical: everything had a proper structure and place, including speaking and writing “well.” Proper speech and behaviour were so important to the Egyptians that the Middle Kingdom saw the rise of wisdom literature, a type of text used to teach upper-class Egyptians how to advance themselves in society through speaking impressively and conducting themselves appropriately in their language (Fischer-Elfert 2003: 119-121). In a similar vein, it is also widely accepted by Egyptologists that the spoken form of the language during the Middle and New Kingdom periods likely differed from the written form – that is, what scholars call “Late Egyptian” was likely the spoken language as early as the latter part of the Middle Kingdom, though the language used in writing at that time was still Middle Egyptian (Allen 2013: 1-3). There is evidence of this in the form of Late Egyptian morphosyntactic phenomena appearing in Middle Kingdom colloquial contexts like letters – including the $p$² possessive variant (Hoch 1997: 152).

²After the Third Intermediate Period, a new type of Egyptian script was introduced: Demotic, so named after the language stage it represents (Allen 2010). Demotic bears some resemblance to hieratic and hieroglyphic, but in the interest of scope, it is not included in this dissertation. Likewise, during the Coptic stage of Egyptian during 1st century AD, another new script was adapted from Greek: the Coptic script (Allen 2010). In the interest of scope, this project includes neither the Coptic language stage nor its corresponding script.
The idea of speaking “correctly” was highly emphasized well into the New Kingdom too. But in order to clarify, I must present some Egyptian military history.

Recall that between the Middle and New Kingdoms is the Second Intermediate Period. However, this particular Intermediate Period was not a simple decentralization of power: though it can be argued that such periods are never “simple,” this one was particularly violent. As the union of Upper and Lower Egypt crumbled in 17th century BC, a power in the east was rising and ready to take over the country: the Hyksos. It is unclear who, exactly, the Hyksos were – their name is the Greek pronunciation of Egyptian ʰq ʰiswt, which simply means “foreign rulers” – but it is believed that they were an Asiatic people of mixed origin (Booth 2005; Redford 1970). It is not clear what year exactly the invasion came – such a turbulent time did not leave as many records as we would like – but scholars place it sometime in the mid-1600s BC (Booth 2005; Redford 1970).

Caananites had settled in Lower Egypt about a century and a half before, sometime towards the end of the 12th Dynasty, c. 1800, so it was easier for the Hyksos, whoever they were, to take advantage of the kings’ lack of control of Lower Egypt, and to push them back to the far south of Upper Egypt – especially if modern hypotheses of additional plague and famine are true (Ryholt 1997). One major source we have about this period is the historian Manetho, who lived in Egypt during the Ptolemaic Period c. 240 BC. While he lived centuries after the Hyksos period, his writings have proven useful and relatively accurate on other Egyptian matters. About the Hyksos he writes the following:

\[F\]or what cause I know not, a blast of God smote us; and unexpectedly, from the regions of the East, invaders of obscure race marched in confidence of victory against our land. By main force they easily overpowered the rulers of the land, they then burned our cities ruthlessly, razed to the ground the temples of the gods, and treated all the natives with a cruel hostility, massacring some and leading into slavery the wives and children of others. Finally, they appointed as king one of their number whose name was Salitis. He had his seat at Memphis, levying tribute from Upper and Lower Egypt, and leaving garrisons behind in the most advantageous positions. Above all, he fortified the district to the east....

(Waddell 1940: 114)

This description, in conjunction with archaeological records, corroborates the claim that the Hyksos came from the Levant – outside of Egypt, with different customs and a different language. It also illustrates the level of destruction that the Hyksos brought on Egypt’s native population, and the hatred of the Egyptians for their foreign conquerors. Romano-Jewish historian Josephus, who lived during the first century AD, quotes Manetho regarding the following about the fall of the Hyksos:
Chapter 1. Introduction

[T]he kings of Thebes and the other parts of Egypt rose against the shepherds, and a long and terrible war was fought between them.” ... By a king, named Alisphragmuthosis, the shepherds were subdued, and were driven out of the most parts of Egypt and shut up in a place named Avaris, measuring ten thousand acres... Later [King] Amenophis returned from Kush with a great army, his son Ahampses led another army, and both of them joined battle with the shepherds and the polluted people, and conquered them, and killed a great many of them, and pursued them to the borders of Syria.

(Shilleto 1999: 186-187)

Again, this passage makes clear the level of hatred the Egyptians had for their Hyksos overlords. It also gives us a time period for when the Hyksos were driven out: we can surmise from this passage, substantiated by archaeological evidence, that the Hyksos rule lasted until the close of the 17th Dynasty, c. 1560 BC. It was at this point that the Egyptians finally staged a rebellion under the leadership of Seqenenre Taa, followed by his son, Wadjkheperre Kamose. It is likely that both died in the battle for Egyptian freedom from foreign rule (Shaw 2009; Smith 2000). Kamose’s wife, Ahhotep, became regent until their son Ahmose I was old enough to rule – and successfully drive the Hyksos from Egypt for good (Shaw 2009).

Once the Hyksos reign ended, Egyptians sought to remove all traces of foreign rule, foreign customs, foreign inventions, and foreign language. They never forgot the Second Intermediate Period, and collectively the country’s attitude and writings reflected this in an elevation of all things Egyptian and a continued distaste for anything foreign – evident even before this period in the description of all things Asiatic in The Story of Sinhue, one of the most famous Egyptian tales. Indeed, on entering the New Kingdom, Egyptians saw themselves as restored to their former glory (Shaw 2009), looking back on the Middle Kingdom as a golden age – a time when foreigners had neither ruled nor wounded the collective Egyptian psyche, when kings were great and Egypt was united and unscarred.

Accordingly, Middle Egyptian was seen as a perfect form of the Egyptian language, untouched by foreign elements or new forms (Allen 2010; Fischer-Elfert 2003; Parkinson 2002). This view gave rise to a further discrepancy between writing and spoken language, where Middle Egyptian elements were much more frequent in writing than they likely were in actual speech, evidenced by their higher frequency in more vernacular forms of writing (Allen 2010; Hoch 1997; Gardiner 1957). But since the spoken language had already advanced so thoroughly into Late Egyptian even during the Middle Kingdom before the Hyksos invasion, Late Egyptian elements can be observed in texts, especially vernacular ones, from the both the Middle and New Kingdoms (Hoch 1997; Gardiner 1957) – it was impossible to keep
them out of writing entirely.

Included among these elements are the $p^3$ possessive. While no one could stop the progression of new forms, there is one indication from Dynasty 12 (c. 1991-1803 BC) of the Middle Kingdom (Dynasties 11-14), written on the stela of Mentuwoser, that the Egyptians may have tried to do so with $p^3$ demonstratives and possessives in an attempt to speak "well":

(4) a. jnk mdw r r1-r swy m ddw $p^3$w
   lsg speak to style nobleman MPL free-from in saying MPL $p^3$-MPL
   'I am one who speaks according to the style of noblemen, free of saying $p^3$'

(Sethe 1960: 79,17)

The word that this text refers to – the $p^3$ – appears to be the masculine form of the pre-nominal article, which is also the same article that appears in the $p^3$ possessive. This piece of text is the only piece of meta-data found to date about the innovative $p^3$ demonstrative and $p^3$ possessive, and it provides evidence that this new form is looked down upon, or at least it was at the point in Egyptian history during which the stela was carved.3

However, despite the stigma, or perhaps because of it, it is thought that during the New Kingdom the $p^3$ possessive became prolific, specifically during a time known as the Amarna Period (Kupreyev 2013). It is during this period, at the end of the 18th Dynasty, that the pharaoh Amenhotep IV changed his name to Akhenaten and moved the capital city from the traditional Thebes to Amarna – known then as Akhetaten (Kupreyev 2013; Shaw 2009). Akhenaten’s reign was marked by the political turbulence caused by his separation from the traditional city of Thebes and from the traditional Egyptian temples in favour of the worship of a single god: the Aten (Kupreyev 2013; Shaw 2009). Akhenaten also encouraged new forms of music, poetry, art, and writing – including, perhaps, the use of the stigmatized $p^3$ found in demonstratives and clitic possessives (Kupreyev 2013). While his son, the famous Tutankhamun, restored the capital to Thebes and the temples to their prominent place in society (Shaw 2009), it is possible that the spread of $p^3$ continued after being allowed to flourish previously.

Because of the potential stigma of the pre-nominal article and its associated possessive, influenced even further by Egyptian society’s emphasis on speaking appropriately and properly, as well as the potential influence of the Amarna Period, my dissertation investigates the relationship between time period, texts intended for a wider audience (and therefore more likely to conform to societal standards),

---

3It is possible that the word in question refers to the verb $pw$, ‘to have done in the past,’ but given what we know about the importance in ancient Egypt of acting/speaking properly and playing up one’s past deeds, as discussed above, this interpretation – ‘free of saying what I have done in the past’ would not have been in keeping with the attitudes of the time. That is, it is the opposite of what a typical Egyptian would broadcast on a stela.
and the usage of the two innovative forms. It is my prediction that these forms will have lower usage rates in more formal texts due to stigmatization and the prestige of the older forms, and that the possessive will have increased in use particularly after the Amarna Period, especially in less formal texts.

1.2 Language Change & Natural Variation

Having situated my chosen Egyptian variables within their cultural, geographical, and historical contexts, I now move to situate my work within the broader sociolinguistic context – the study of change and variation, and how we might compare stable variation to variation that leads to language change.

Language variation, present in all languages, is defined as two or more ways of saying the same thing – two or more forms that convey the same meaning (Labov 1963). When language change occurs, one of these forms replaces the other(s), either variably or categorically. This means that all language change involves variation: during the change, all forms will be available for use; a change in progress is a type of variation, involving “the use by individual speakers of two distinct grammatical options in areas of grammar that do not ordinarily permit optionality” (Pintzuk 2003: 510).

It is similarly true that all languages change over time. Consider English: a native speaker of English today finds even Shakespeare’s English to be somewhat odd, and the language of Beowulf is almost indecipherable to a modern English-speaker – yet the English spoken today and the English spoken during the time of Beowulf are simply points in time on the scale of the history of the same language.

There are many types of language change – phonological, morphosyntactic, and semantic. This project is an investigation into morphosyntactic change, so we will focus on that type. There are three major mechanisms for morphosyntactic change: borrowing, extension, and reanalysis (Campbell 2004: 284).

Borrowing involves taking a morphosyntactic construction from another language and using it in one’s native language. For example, Pipil (an Uto-Aztecan language) borrowed the Spanish mas ... que construction (Campbell 2004: 285-286). We will not be focusing on this type of change, as the Egyptian language changes are not examples of borrowing.

Reanalysis is a change in the underlying structure of the construction in question, but does not necessarily change the surface manifestation in every instance of the construction. For example, the Archaic Chinese demonstrative shi became reanalyzed as a copula (‘be’) (Millar 2007: 171-172).

Extension is a change in the surface structure of the construction, but does not affect the underlying structure. For example, the reanalysis of going to as a future marker was once only accessible to purposive and motion verbs (eg. she is going to eat or she is going to travel to Canada), but was extended to other
verbs (eg. *she is going to like him*) (Campbell 2004: 285). This made no changes to the structure of the future *going to* construction, rather it simply gave it more verbs to pair with.

This dissertation focuses on reanalysis, as this is how I account for the changes in Egyptian demonstratives and possessives. The next section will explore the relationship between natural variation and language change, namely the role played by reanalysis in giving rise to natural variation, and when variation leads to language change or when it remains stable.

### 1.2.1 Language Change

When a language change occurs, there is always a period when both old and new forms exist: a period of variation. The variation between old and new forms is often seen as competition for finite resources – but rather than competing for food or mates, linguistic variants are competing for use (Kroch 2001, 1994, 1989).

Over time, the new form’s increase in usage can be modelled using an S-shaped pattern – a logistic function that models the increase of the new form over time – and so the pattern of language change is often referred to as an S-curve. The change begins slowly, with the new form entering use at a low frequency, followed by a period of rapid increase of the new form mid-change, and ending with a petering out or total replacement of the old form (Bailey 1973; Kroch 1989; Labov 1992; Pintzuk 2003; Zuraw 2003). There are several implications that arise from the S-curve model: it may be more difficult to observe the change at its beginning or nearer to its end rather than during the rapid change period in the middle of the timespan, and constraint effects on variability could be more irregular at either end of the change (Wolfram 2006: 9).

In modern practice there are two major frameworks for language change: the drift model and the imperfect transmission model (Kroch 2005). In the drift model, the variants are competing for resources, at which point selection pressures will operate on the number of times a variant is heard, correctly analyzed in acquisition, and then used by the speaker. In this model, one variant then replaces the other (language change), or neither variant has a discernible advantage, and random drift occurs. However, if we follow this model we must also ascribe to the idea of the Principle of Contrast (the idea that no two forms have exactly the same meaning), and the claim that it places pressure on variation. This means that random drift cannot continue indefinitely – either one form is lost or it acquires another meaning. Following this, if the frequency of a form becomes so low that it is not acquired by the child learner, the grammar changes. In the middle of the change, the speaker will have access to both or all grammars (i.e. both or all variants) (Kroch 1994, 1989).
This model is useful because, in it, the cause of language change is easy to find: if the frequency of a form falls too low, children learning the language are no longer able to learn how to use it. However, this model is problematic because the change in frequency does not appear to have any obvious trigger or motivation. The frequency changes could be the result of other social or linguistic factors, but if that is the case, this model offers no reason for any of these factors to become unstable at any given point in time.

The second model for language change is the imperfect transmission model. In this model, contrary to the drift model, change is made first in the grammar, which then causes frequency changes as the grammatical change spreads throughout the speech community (Kroch 2005). The first, internal change is said to be caused by a “mislearning” of the form. This model is often used in cases where language contact is known or assumed to have happened. This is because we know that language learning is probabilistic: given a population of learners, there will be “errors” that occur due to the strength of evidence for any given grammatical form (or lack thereof) (Kroch 2005). That is, language learning “success,” especially in adulthood, is thought to depend on the frequency of tokens of each form, and the amount of variation in the primary data that the learner receives (Kroch 2005). In this respect, the two models are similar; the only difference is that, in this model, the “imperfect transmission” is the proposed catalyst for any forms’ frequency changes.

This model is advantageous because it allows us to eliminate the “randomness” of drift in usage frequencies, instead accounting for drift by proposing that the grammar change occurs first. However, this approach is not without problems as well: we do not know whether these kinds of learning “errors” are common enough that they could conceivably be the cause of every language change, and we lack a model for the propagation and suppression of these “errors” – which is necessary in order to account for the mix of both language change and stable variation that we see when a language is studied diachronically (Kroch 2005).

Kroch (2005) hypothesizes that, while neither model accounts for everything involved in language change, the imperfect transmission model captures real language data better than the random drift model does – because, he argues, there is evidence for innovative forms appearing early in the change as would be predicted by this model (recall that in this model, a change in grammar occurs first and only then do the changes in frequency begin). To support this account, Kroch (2005) makes use of one of generative linguistics’s major concepts: linguistic parameters – ways of constructing language universals that must be set during language acquisition in early childhood. For example, if a language is a pro-drop language, its speakers will have set that particular parameter on while speakers of non-dropping languages will have it set off. Once a parameter is set in a speaker’s mind for any given language, it
cannot be re-set or un-set. If a parameter is set incorrectly because of ignored or missing data, a speaker
 can still learn the “correct” form, but only in the same way that they would learn another dialect – i.e.
 they can only add knowledge; they cannot replace one parameter setting with the other (Kroch 2005). If
 both settings are supported by the language data that the learner receives – like with data from different
 registers – then the learner acquires knowledge of both settings or “dialects.” Variation, then, can be
 thought of in this context as a mini “dialect,” even within the same register. In instances of language
 change, one setting is thought to win out over the other, once the old form’s frequency falls far enough.

Kroch’s (2005) argument for this model is that the random drift model would only predict that forms
 that could not be misinterpreted as an older grammar should only appear towards the end of the change,
 but this is not the case: Pintzuk’s (2005) work on Old English is in support of Kroch’s hypothesis. In
 Old English, the shift from VO to OV word order was previously thought to be the result of random
 drift of the frequency of extraposition, which then had learners interpreting the grammar as VO (Kroch
 2005; Allen 2000). Pintzuk (2002) points out that, if this is so, clear cases of VO order that cannot be
 analyzed as extraposition should only be found near the end of the change. But the data indicate that
 these kinds of tokens can be found quite early in the change (Pintzuk 2002).

Another central aspect of language change is the Constant Rate Effect (CRE) (Kroch 2005; Pintzuk
 2003; Santorini 1992; Pintzuk 1991; Kroch 1989). The CRE is the observation that, when a new form
 is introduced to a language and language change occurs, two things will happen. First, the new form’s
 rate of increase will follow an S-curve pattern: slow at first, then taking off drastically, and then either
 plateauing or replacing the old form completely. Second, while its initial frequency of use may differ
 across linguistic contexts, the rate of the new form’s replacement of the old form(s) will be the same
 across all of these contexts (Kroch 2005; Pintzuk 2003; Santorini 1992; Pintzuk 1991; Kroch 1989). That
 is, the new form’s usage will increase at a rate that is irrespective of context. “Context” here usually
 refers to linguistic factors that are seen to condition the use of one variant over another. Examples
 of these include sentence type, clause type, subject type, or any other kind of grammatical contrast
 (Tagliamonte 2011: 83).

The first results of testing this effect on Ancient Egyptian come from my pilot study of the two clitic
 possessive variants, tested not on linguistic factors, but on the social factor text type (Gardiner 2015b).
The results supported the CRE, showing that while the initial frequencies of the *p*variants differed
 in letters and official texts, the rate of increase of the *p*form in both text types was the same. In
 this project, I use Constant Rate Effect testing to show that Egyptian clitic possession is an appropriate
 choice of language change variable, and is therefore suitable for comparison to nominal possession.

Kroch (2005) uses the CRE to support the imperfect transmission model for English V-to-I movement
change. In questions, the V-to-I word order did not disappear until the 17th century, and was possible in negative sentences into the 18th century (Lightfoot 1993, 1999). Kroch’s (2005) claim is that the re-analysis – the new, non-V-to-I grammar – actually appeared as early as the 16th century. The discrepancy in this case lies in what constitutes “the change.” It has often been argued that between the end of Middle English (when periphrastic do is introduced) and the end of 18th century (when the old word order is fully lost), the frequency of periphrastic do increased due to random drift. This, combined with other changes to English, is what eventually lead to the grammatical reanalysis (language change) that made the old order impossible. Kroch (2005), on the other hand, argues that the grammar change occurred first, the two grammars competed during the period from the end of Middle English up until the 18th century, with the old grammar decreasing in frequency until it finally died out.

While the data do not give obvious indications of a change in the mid-16th century in this case, Kroch (2005) makes use of data from other constructions: the use of do in questions increased in the typical S-curve pattern, but the same curve for negative declaratives reached a plateau in the mid-16th century and did not change again until the 17th century. The rate of increase of do is the same in negative declaratives and questions until this 16th century pause. Likewise, negative imperatives and affirmative declaratives behave the same way into the mid-16th century, when negative imperatives begin to behave like negative declaratives. These facts suggest that there was a change in the mid-16th century, supporting Kroch’s (2005) account. This point in time would be when V-to-T was lost in English, which meant that verb movement to lower positions was also lost, and as this occurred, the use of periphrastic do necessarily increased. Since imperatives have Mood and Aspect projections which are lower in the tree, the loss of this kind of verb-movement also forces the use of do in negative imperatives (Kroch 2005).

While the model accounts for the data sets described above, we still need a reason for new forms to enter use, and a reason for them to result in a loss of one “grammar.” Kroch (2005) proposes several factors that might lead to this: the first is language contact. It is well-known that most adults are not as proficient at language-learning as children are. Therefore, if a community has enough adults whose native language is not the majority language, they should be more apt to make “transmission errors” in teaching their children the majority language (Kroch 2005). This is similar to the principle that creates creoles: the adults form a pidgin while the next generation uses probabilistic learning to create a creole. In this scenario, the second generation accidentally learns the “errors” their parents made, which then become analyzed as a new form/grammar. These kinds of “errors” can be furthered by modern society, wherein children spend much of their time with other children rather than with adults: children learn “errors” from other children and transmit these reanalyzed forms to each other, and grammar
competition is born.

This model accounts for the patterns of morphosyntactic change, but there are some unresolved issues, which (Labov 2001: 1) sums up:

1. Linguistic changes show a sporadic character, beginning and ending abruptly at times that are not predicted by any universal principles.

2. It is not uncommon to find retrograde movements, where the direction of change reverses, or opposing directions of movement in parallel communities.

3. Stable, long-term variation that persists over many centuries in much the same form is perhaps even more common than changes which go to completion.

It is also worth expanding on these points. Regarding (1): Kroch (2005) proposes two extralinguistic factors that are responsible for the initial reanalysis rather than using language universals to predict such changes – i.e. language contact, and children spending more time with each other and less time with adults – but we simply cannot tell whether either of these options is the case for the Egyptian changes.

Retrograde movements as per (2) do not preclude the idea of transmission errors – if both grammars are still available (i.e. the change has not yet reached completion) it is not unreasonable to assume that one speaker may make an “error” back to the original analysis. An interesting result of these kinds of errors could be the appearance of mostly stable variation over time: if a significant portion of speakers of each generation always reverts back to the original grammar, then the old form is never lost; while simultaneously if a significant portion have the new grammar, then it is never lost either. The result is that neither variant is ever lost, and neither variant ever exhaustively out-competes the other. It is possible that this is the case for stable variation that exists due to lifespan change, wherein one variant is more frequent for younger speakers, but as those speakers get older another variant prevails.

Finally, (3) is perhaps the most intriguing point – is stable variation more common than language change? If so, why is most research conducted on language change variables? Are these “stable” variables really just very slow language change? It raises the question: how long must a language change take before we cease to call it stable? If this is so, it would be impractical to be required to wait thousands of years for every variable before making any claims about its stability; we would benefit more from finding a way to distinguish stable variation from language change that will allow us to predict which outcome we will see in any given variable. This may mean revisiting the definition of “stable variation.”

In that vein, the following section discusses stable variation and how we define it, presenting the most
recent theories about how to distinguish generational change from lifespan change from stability in real time, followed by a section detailing the ways we can use an ancient language like Egyptian to further this goal.

### 1.2.2 Stable Variation

When variation does not result in language change, it is referred to as “stable.” Stable variation often involves “a simple alternation in constituent order” (Pintzuk 2003: 509); examples from other languages include the object shift patterns of Scandinavian languages (Bobaljik and Thrainsson 1998) and the postposition variation in Ancient Greek and Yiddish (Taylor 1994; Santorini 1993). Generally-speaking, the most frequently-studied stable sociolinguistic variables in English cities have the following six characteristics, using the example of the variable consonant at the end of \textit{-ing} words like ‘swimming’:

1. *Regular social stratification is maintained for each contextual style.* [The rate of use of] (ing) is a monotonic function of social class: that is, each step upward in class status is associated with a decrease in the (ing) index.

2. *Regular stylistic stratification is maintained for each social class ... each increase in formality (or attention paid to speech) is accompanied by a decrease in (in) values.*

3. *As a consequence of (1), all social groups are differentiated by their treatment of the variable, but as a consequence of (2), all social groups are similar in following the same pattern of style shifting.*

4. *The same variable (ing) therefore serves as a marker of cultural levels and contextual styles.*

5. *Though there is considerable individual variation within each group, it is not normally large enough to disturb the regularity of the pattern when 5 to 10 speakers are included in each group. Individuals whose deviation from the mean is large enough to disturb the pattern are marked by aberrant social histories.*

6. *Although the variable is highly constrained, it remains a random variable: that is, an event whose outcome cannot be predicted.*

(Labov 2001: 6)

There are also three major ways in which these patterns of stable sociolinguistic variation can differ:

1. *Sharp vs. gradient social stratification.* In place of the even spacing of social classes ... there may be sharp separation of opposing ends of the social spectrum. Thus the (ing) pattern in Norwich
shows a sharp separation of the two middle class groups as against the three working class groups, a division of the speech community that reflects the sharper divisions among social classes in British society Trudgill (1974).

2. **Sharp vs. gradient stylistic stratification.** The spacing of the styles ... is more arbitrary than the spacing of social classes. However, it is clear that there is no qualitative break between spontaneous speech–casual and careful–and controlled styles, where the subject is reading. In the Tehran dialect of Farsi, all of the sociolinguistic variables investigated showed an abrupt break when the subjects began to read: use of the colloquial urban variant dropped from the majority use in spontaneous speech to almost zero in reading (Modaressi 1978: 104) ... A similar situation appears in the raising of /o/ to /u/ in Seoul Korean Chae (1995).

3. **The cross-over pattern: hypercorrect behavior of the second highest status group** It is a common feature of many sociolinguistic profiles that the second highest status group shows a steeper slope of style shifting than other groups. With increasing formality, this group shows a more rapid retreat from the use of a stigmatized form, or advance in the use of a prestige form. In extreme cases, this can lead to a cross-over of their values with that of the highest status group.

(Labov 2001: 7)

It may appear from these descriptions of English -ing that stable variables are stable due to their social markers, but this conclusion is not necessarily accurate: it is only natural that any variable which has existed in a given speech community for a long period of time should come to be associated with particular social meaning.

Finally, Labov also states that stable variables are “in the grammar; they are constrained by the grammar; and cannot be described apart from the grammar” (Labov 2001: 10), but that they differ from those variables where the result is language change in that “they do not dominate any large portion of [the grammar], and the consequences of their alternation for the rest of the grammar are minimal” (Labov 2001: 10).

### 1.2.3 Lifespan Change

Linked with both language change and stable variation is the concept of lifespan change – that is, as a speaker becomes older, the way they express a given variable changes. The result is that young speakers favour one variant while older speakers prefer another – a pattern sociolinguists call “age-grading” (Wagner 2012; Labov 1992). Typically it is the non-standard, often stigmatized, variant that is favoured
by younger speakers – and occasionally the oldest speakers – while the middle-aged speakers favour the standard, more prestigious form (Wagner 2012).

This pattern has been found in many large-scale studies of several variables. For example, work on Montreal French future alternation displays this pattern. Sankoff and Wagner (2011) found evidence for the so-called “postadolescent retreat” – when younger adults begin to decrease their use of the nonstandard form as they mature, further favouring the standard variant as they enter middle age – in their study of 59 informants aged 16 to 52 years old. The findings in Sankoff and Wagner (2011) indicate that the overall use of the marked morphological variant – synthetic future – increased over speakers' lifetimes. This is to say that, in Montreal French, future alternation between periphrastic and synthetic forms is considered to be stable over time, but Sankoff and Wagner (2011) found that there is change – it just occurs over an individual’s lifetime rather than generationally, keeping the variation stable as we observe it from a larger perspective. This is the definition of age-grading.

Sankoff and Wagner (2011) also found in their multivariate analysis that the future variation was significantly associated with higher social class and use of formal address pronouns. This is another typical facet of age-grading/lifespan change: has been hypothesized that the pattern seen in age-grading is a response to linguistic marketplace pressures – that is, age-grading may only affect adults whose occupations are, in some way, language-dependent (Wagner 2012; Chambers 2013, 2008; Bourdeieu and Botanski 1975).

This raises questions about a potential confound which we have already discussed: style. Higher rates of the standard form could be a result of style-shift rather than age-grading. Because of this potential confound, more recent studies have begun to disentangle age-grading from style shift, revealing a more complex picture than before: when Sankoff et al. (2011) re-investigated Montreal French future, this time investigating style shift as well, they found that style had no significant effect on the increase in analytic future over the participants’ lifetimes – indicating that age-grading and style shift are two different phenomena. These findings highlight the need to carefully separate the effects of style and the effects of age-grading on a variable’s stability or change over time.

1.2.4 The Continuity Hypothesis

In another discussion of stable variation, Wallenberg (2013) and Fruehwald and Wallenberg (2013) further Kroch’s (2005) imperfect transmission model, proposing that all instances of variation are the result of competing grammar – i.e. a new form appears, and then competes with the old form for use. It follows from this competition that most instances of variation will lead to language change: in most
cases, competition will be diachronically unstable, mainly due to the Principle of Contrast, which states that no two forms should have exactly the same meaning (Wallenberg 2013; Fruehwald and Wallenberg 2013).

This competition should, therefore, lead to one of two possible outcomes: language change or specialization (Wallenberg 2013; Fruehwald and Wallenberg 2013). Specialization can be broken down further into two types. The first of these is specialization for different functions. This scenario stops the change from going to completion: both forms are still available, each under specific circumstances. But it also stops the variation: each form is categorically split for different functions (Wallenberg 2013; Fruehwald and Wallenberg 2013). The second possible outcome of specialization is partial specialization. This type, instead of splitting the variants categorically, sees them specialize along a continuous or ordinal dimension—it is created by a continuous or ordinal factor group, or independent variable. In this scenario, variation still exists: rather than a single environment in which one variant is favoured, there are many environments where a variant’s likelihood of occurring slowly increases incrementally. This, Wallenberg (2013) and Fruehwald and Wallenberg (2013) argue, is what we know as stable variation.

In sum, any kind of specialization has an effect on the competition between variants, but partial specialization keeps the variation stochastic. However, the continuous factor group involved in partial specialization does not remove all the competition between variants, and so it can only slow the change to a degree where we are not able to observe its progression—so it appears “stable” to us. That is, Wallenberg (2013) and Fruehwald and Wallenberg (2013) propose that there is no such thing as truly stable variation, only extremely slow language change constrained by a continuous (or ordinal) factor.4

The continuous factor idea is based on data from English vs. Icelandic embedded yes/no questions, wherein English sees specialization which appears to be due to continuous factors like prosody and style, while Icelandic sees replacement and has no continuous factors (Wallenberg 2013). This hypothesis is tested further in Wallenberg (2013) using a case study of clause extraposition in theParsed Corpus of Early English, with results indicating that prosodic weight, coded as a continuous factor where a token receives a score from 0-50, is a significant predictor of variant choice. That is, extraposition is specialized along the continuum of prosodic weight, with objects being more likely to be extraposed the higher the prosodic weight score (Wallenberg 2013). Wallenberg (2013) also proposes that the much-studied -ing variable in English is situated along a continuum—in this case, grammatical category. While generally speaking, we might think of grammatical category as a categorical factor group, Wallenberg (2013) suggests that for the -ing variable, this factor group might exist a long a continuum from noun to verb.

---

4It is clear that this effect can be made by either a continuous or ordinal factor/independent variable, but for efficiency’s sake, I will henceforth use “continuous” to describe this type of variable. Likewise, for similar reasons I will use “factor” or “factor group” to describe an independent variable, though the terms are interchangeable.
Chapter 1. Introduction

with varying points in between (such as gerunds).

The continuous factor idea is not entirely new, either: Pintzuk and Taylor (2011) test and find support for a similar hypothesis using data from Icelandic and Old English, namely that stable variation is influenced by information structure constraints (including the continuous variable phrase complexity), but linguistic change over time is not. That is, Pintzuk and Taylor (2011) find that syntactic change over time proceeds independently of variation that is due to information status and phrase complexity.

What these findings tell us is that, while language change has been very well-investigated thus far, there are still gaps in our knowledge. When variationist sociolinguistics was first established as a scientific discipline, Weinreich et al. (1968) discussed five problems that became its core questions: constraints (what kinds of changes are possible vs. impossible?), embedding (how does a language become embedded in the community?), evaluation (what effect to community members’ evaluations of language have on language change?), transition (how does a language change happen, and how does it proceed?), and actuation (what causes the emergence of a new form in a given language?). Our understanding of the role that stable variation plays in these problems is nowhere near complete. Indeed, we have only begun to fill the void here: while we have some indications of what kinds of morphosyntactic forms are involved in stable variation, we have only begun to investigate what causes stability, and there is a lack of consensus on what it means for a variable to be “stable” – a variable may be subject to change within an individual’s lifetime but the community as a whole remains stable over generations – and on what kinds of intra- or extra-grammatical factors can block language change and cause two (or more) forms to stabilize.

Given that we understand very little about what makes stable variation stable, I investigate the possible effects of the idea presented in Wallenberg (2013) and Fruehwald and Wallenberg (2013) that all variation is competing grammars. Specifically, I examine whether the side effect of the Wallenberg and Fruehwald theory, that a continuous factor will slow the competition to the point where the variation appears stable over time, has merit in real-world data with a large amount of time depth. I will refer to this side effect as the Continuity Hypothesis.

1.3 Meta-Analysis of the Effect of Continuous Factors

While the Continuity Hypothesis is intriguing, it is also very new and the claims made by Wallenberg (2013) and Fruehwald and Wallenberg (2013) in their competing grammars proposal are very strong. Therefore, before testing this hypothesis on my own data, I must situate it within the broader variationist sociolinguistic context. In that vein, I now present a meta-analysis which provides insight into how well
Chapter 1. Introduction

The Continuity Hypothesis is supported by research conducted by other scholars on stable and changing language variation.\textsuperscript{5} It examines a sample of previous variationist sociolinguistic studies from the journal *Language Variation & Change* (*LVC*) and observe whether the predictions made by Wallenberg (2013) and Fruehwald and Wallenberg (2013) are supported by other research. For example, are there other studies that investigate the stable variable *-ing* and its continuous factors? If the Continuity Hypothesis is correct, we should see stable variables being constrained by factors that exist (or could exist) on a continuum – though these variables may also be governed by discrete/categorical factors.

This meta-analysis provides a jumping-off point for creating a fuller theory of the mechanisms behind language change and variation, allowing for more accurate predictions of which variables occur in scenarios that will lead to language change, and which variables are in scenarios that will lead to stable variation. The results provided by the meta-analysis thus inform my predictions about Egyptian stability vs. language change.

1.3.1 Meta-Analysis Methods

Issues of *Language Variation and Change* (*LVC*) were examined, from Vols. 22-27 (2010-2015). By restricting this study to the last five years, time is allowed for increased usage Rbrul (Johnson 2015), a statistical package for multivariate analysis, which can model continuous factors. This was necessary because Rbrul’s predecessors such as Goldvarb (Sankoff et al. 2012) could only model categorical factors. Using Rbrul, researchers can compare whether continuous models or categorical models of their independent variables are a better fit for their data.

After excluding articles that did not conform to type requirements, the result was 35 entries (tokens) from Vols 24-27. These tokens included only 6 instances where the variable was considered stable. Since the goal was to observe stable variables as compared to change variables, entries from Vols. 22 and 23 were only extracted if the paper contained an analysis of a stable variable. This addition yielded two additional stable variable tokens. One additional language change entry was added as well, as it came from one of the two stable variable articles. Therefore, 38 tokens were obtained in total.

Each dependent variable in each article was coded for whether it was observed by the author(s) themselves to be stable (partial specialization that never ends in specialization or replacement), change in progress (specialization in categorical contexts, or complete replacement in all contexts), or status unknown (including those where the stability of the variable is not discussed at all). These distinctions were always based on direct mention by the author(s) of the variable(s) being stable or changing, with

---

\textsuperscript{5}A preliminary version of this analysis was presented in Gardiner and Nagy (2017). What follows here is a more in-depth analysis.
the only exceptions being \textit{-ing} and \textit{t/d} deletion in Canadian or American English. The reason for these exceptions is that both of these variables are widely accepted as stable in Standard North American varieties of English. If the article studied a variety of English in which either of these was \textit{not} stable, it was coded as a \textit{change} variable instead.

In addition, for each variable, the following characteristics were also noted:

1. the variable’s significant independent variables (factors), both social and linguistic

2. whether style was a significant factor

3. whether any independent variable (factor) was modelled as continuous, or could be modelled as continuous

The independent variable style was added in a separate category from the other possible independent variables. This is because, while style is often treated as discrete, Wallenberg (2013) and Fruehwald and Wallenberg (2013) argue for a continuous model of style. The social factors age, year of birth, and year of recording were excluded: they are are by nature continuous, but a change over time should by nature be correlated with year of birth and age. That is, older people (i.e. those with earlier birth years) will usually retain the older variant, while younger speakers will use more of the new variant. Frequency was also excluded as an independent variable, as previous research indicates that it has two apparently contradictory effects on language change: frequency can lead to a) phonetic reduction and/or grammaticalization Phillips (2001, 1984) and therefore language change, and b) frequently-used forms resisting structural change (Diessel 2007; Bybee and Thompson 1997; Hopper and Traugott 1993). Essentially, frequency has been hypothesized both to cause change and to block it – which makes it difficult to set a prediction for its potential effects in this meta-analysis.

Finally, as the purpose of this study was to test the Continuity Hypothesis, it was important to consider whether each independent variable was considered to be a discrete one or a continuous one. While very few independent variables were actually modelled as continuous, the discussion that follows also considers independent variables that could be modelled as continuous and addresses their effects on variation, stable or otherwise. However, it is also important to note that the authors of these studies did choose to model these variables discretely rather than continuously, despite the ability of Rbrul to run models with continuous/ordinal independent variables. Therefore, we should be cautious in considering potentially continuous models for every independent variable here: we must assume that these authors believed that discrete models for the independent variables in question were the best model for analyzing the variation in their studies.
1.3.2 Meta-Analysis Results

First, I discuss the results which report stable variation, followed by a discussion of the results reporting change in progress. Finally, I discuss possible interpretations of the studies where the author(s) did not indicate whether the variable was stable or changing. I then discuss options in terms of how to model style – whether it should be considered continuous or discrete – and choices for social factors in general.

Stable Variables

8 of the 38 dependent variables were stable. Table 1.1 shows these 8 variables and what factors constrain them. Only a single factor from one of these studies was explicitly modelled as continuous: an attitudinal index score, in Haddican et al.’s (2013) study of Northern England vowel-fronting. They found that a more positive attitude towards the region did significantly correlate with increased vowel-fronting (Haddican et al. 2013). Haddican et al. (2013) also find that vowel variables in this region that are not correlated with the continuous factor are change variables rather than stable. These results support the Continuity Hypothesis: the stable variable is constrained by the continuous factor, attitudinal index score, while the change variable is not.

No other stable variable studies modelled any factors as continuous, but this is not necessarily an indication that continuous factors do not exist for these variables. As research continues, we may find more factors to be relevant. Additionally, we may be able to model some currently discretely modelled factors along a continuum: for example, the factor following/preceding sound could be modelled in future work as a continuous range, perhaps along a sonority scale. This avenue is promising: preceding sound was significant in Korean /y/ variation (Jin 2012), following sound was a significant factor in Raleigh English -ing (Forrest 2015), following and preceding sound were both significant factors in Canadian t/d deletion (Walker 2012; Hoffman and Walker 2010), and following sound was the most influential factor in Appalachian English t/d deletion (Hazen 2011), all stable variables.

Language Change Variables

23 of the 38 dependent variables were labelled by the author(s) as language change, either completed or in progress, in real and/or apparent time.6 No factors for any of these variables were modelled as continuous. This is not surprising, as the majority of the factors studied for these variables were evidently categorical, including noun animacy, gender/number, tense/aspect/mood, region, and sex. However, three factors

---

<table>
<thead>
<tr>
<th>Variable</th>
<th>Linguistic Factors</th>
<th>Social Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raleigh Eng -ing (Forrest 2015)</td>
<td>lexical category following sound</td>
<td>education sex</td>
</tr>
<tr>
<td>Northern Eng vowels (Haddican et al. 2013)</td>
<td>preceding sound following sound</td>
<td>sex attitudinal index score</td>
</tr>
<tr>
<td>Korean /y/ (Jin 2012)</td>
<td>preceding segment syllable context syllable onset (y/n)</td>
<td>gender SES</td>
</tr>
<tr>
<td>English -ing (Wagner 2012)</td>
<td>following segment</td>
<td>style post-high school transition ethnicity SES</td>
</tr>
<tr>
<td>Hebrew gender (Levon 2012)</td>
<td>constituent type neutralization number</td>
<td>speaker group speaker sex</td>
</tr>
<tr>
<td>Canadian Eng t/d deletion (Walker 2012)</td>
<td>preceding phonology morphological status following phonology</td>
<td></td>
</tr>
<tr>
<td>Appalachian Eng t/d deletion (Hazen 2011)</td>
<td>following phonology preceding phonology morphological type</td>
<td>gender region education ethnicity social class</td>
</tr>
<tr>
<td>Toronto English Chinese &amp; Italian community t/d deletion (Hoffman and Walker 2010)</td>
<td>phonological context morphological status</td>
<td>ethnicity sex</td>
</tr>
</tbody>
</table>

Table 1.1: Stable variables and factors studied. Potentially continuous factors are in italics; the factor modelled as continuous is in bold.

from two dependent variables could modelled continuously, and in these we might find evidence for or against the Continuity Hypothesis.

The first example of these is found in a study of the change towards rhoticity in New York City English (Becker 2014). Becker (2014) finds that preceding phonological context, a potentially continuous factor, does have a significant effect on the variation. In this paper, preceding phonological context refers specifically to preceding vowel, which could be modelled continuously along a sonority scale. However, if we observe the constraint rankings for this data, it is evident that the results are not ordered along a sonority hierarchy: the burr vowel (mid) has the highest factor weight (0.83), then beer (high; FW 0.53), bar (low; FW 0.42), bear (mid; FW 0.38), and finally bore (mid; FW 0.29). We would have expected a scale of high – mid – low or low – mid – high, if this had been a continuous factor.

Secondly, Hoffman and Walker (2010) find that following phonology was significant in the Canadian Vowel Shift in Chinese and Italian communities speaking Toronto English. In this case “following phonology” was specifically manner of articulation. While this could be modelled continuously, the constraint rankings jump from mid-continuum, to one end, to the other end, rather than showing a
steady progression along a scale. We would expect the latter if this variable were continuous.

These two sets of results bring up an important point: that it is not enough to say that the variable is potentially continuous, despite not being modelled as such, but that it must also behave in a continuous manner. That is, it must be seen to increasingly favour one variant as we approach one end of the continuum, while also disfavouring that variant as we approach the other end of the continuum.

A third example of a factor from the language change tokens that could be modelled on a continuum is word length, either by number of segments or number of syllables. In this meta-analysis, word length was used to investigate only one variable: the change towards rhoticity in New York City English (Becker 2014). While it was not modelled as continuous, it was found to be the only internal factor that was not significant in New York City rhoticity.

These findings bring up another important point: even if a factor is not overtly modelled as continuous, it can still be continuous in the way it affects the variation. That is, we need not have a continuous model to test the Continuity Hypothesis, provided that it is possible to tell whether or not the factor group’s constraint rankings are ordered along a continuous or ordinal scale.

None of these findings contradict the Continuity Hypothesis – indeed, these studies find that continuous factors do not constrain change variables at all.

**Status Unknown: Making Predictions**

The remaining 7 dependent variables were categorized as status unknown: it was unclear whether they were instances of language change in progress, or of stable variation. Several of the papers’ authors explicitly state that their variables’ trajectories remain unknown, either due to the newness of the variable or the paucity of research on the given variable.

There are three “unknown” variables where the authors test continuous or potentially continuous factors. Weatherholtz et al. (2014) studied to- and for-dative variation, as well as variation between these and non-overt datives. This study did model some factors as continuous – all social factors, represented by Likert scales. The factors were interpersonal similarity, participant’s political ideology, speaker’s accent standardness, participant avoids conflict, participant compromises during conflict, speaker’s political ideology, participant dominates during conflict, speaker sounds smart, and participant’s accent ideology. Since these social factors are continuous and significant, the Continuity Hypothesis predicts that this factor should be stable over time.

Another “unknown” variable with a potentially-continuous factor is /p/- and /k/-lenition in Murrinh

---

7These tokens were from Scherre and Naro (2014), Weatherholtz et al. (2014), Owens et al. (2013), Podesva et al. (2015b), Schleef (2013), Mansfield (2015), Brown and Riveras (2012).
Patha, which was found to be constrained by preceding segment (Mansfield 2015) – a factor that could be modelled along a sonority continuum. As this factor was found to have a significant effect on variation, the Continuity Hypothesis predicts that this variable will be stable over time.

Similarly, in unreleased /t/ in the speech of various’ politicians, preceding sound and following sound were both significant but modelled as discrete variables (Podesva et al. 2015b). Again, the Continuity Hypothesis predicts that it will be stable over time.

Finally, Brown and Riveras (2012) find that Spanish *haber* verb morphology in Puerto Rican Spanish is constrained by proportion of noun use as subject. This factor was modelled in a ternary way in the paper: high, low, and mid. However, if raw numbers were used instead, this factor could be modelled on a continuum. Since it was found to be significant, the Continuity Hypothesis predicts that this variable should be stable.

### 1.3.3 Discussion

Overall, we have seen a good deal of support for the Continuity Hypothesis. All but one of the stable variables are constrained by a potentially continuous factor that behaves in a continuous way, and the only stable variable that is not so constrained was not tested with any potentially continuous factors (Levon 2012). The findings also indicate that no language change variable is constrained by a potentially continuous factor – excluding style, which is discussed below. The main findings for change and stable variables are shown in Table 1.2; a Fisher’s exact test comparing the change variables’ results to the stable variables’ results shows the difference to be statistically significant ($p < 0.0001$).

<table>
<thead>
<tr>
<th>Stable Variables</th>
<th>Change Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>at least one significant (potentially) continuous factor</td>
<td>7</td>
</tr>
<tr>
<td>no significant continuous factors</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1.2: Stable and change variables with continuous factors (excluding style).

### Using Social Factors

However, there are two remaining caveats to this meta-analysis. The first is the effects of social factors: it must be noted that the factors discussed as “potentially continuous” do not include social factors such as socioeconomic status, class, or education. While it is worth considering that these factors are arguably continuous by nature, they are also factors which remain constant for each speaker. That is, while it is possible to change one’s socioeconomic status, it is not possible to do so from utterance to utterance. For example, one cannot be working class one minute and upper class the next, then back to working
class again. Any changes a speaker makes to accommodate someone from a different social class would be attributed to code-switching between dialects, or style shift. Similarly, while it is possible to increase one’s level of education over time, a speaker cannot go backwards in this respect – for example, one cannot obtain a doctorate one minute, and then return in the next utterance to never having received it.

Therefore, in testing the Continuity Hypothesis, we can only consider continuous factors that the speaker him- or herself can alter depending on context.

This same logic will nullify the Haddican et al. (2013) results for the Continuity Hypothesis, and likewise the continuity-related predictions made for Weatherholtz et al. (2014) results: their only continuous factors were social factors unlikely to change from utterance to utterance for any given speaker. However, this not not preclude other, linguistic factors from affecting these variables in a continuous way, and discounting the continuity effects on these two variables neither supports nor disproves the Continuity Hypothesis.

These issues relegate assessments of the Continuity Hypothesis to relying on the linguistic factors discussed above, and on one social factor: style.

Style

Recall that, while style is often discussed in terms of being discrete, Wallenberg (2013) and Fruehwald and Wallenberg (2013) prefer to think of style as a continuous scale of formality. Likewise, Biber (1995) and Jankowski (2013) provide several methods by which register, often equated with style, can be measured along a continuum as well. Three studies in the LVC dataset included style as a factor. And style, unlike other social factors, is easily changed by the individual in any given utterance – giving us the potential for Continuity Hypothesis testing.

Wagner (2012), a study of -ing in adolescents, was the only stable variable where style was included in the logistic regression analysis. It was found to have a significant effect on variant choice. Wagner (2012) modelled style as binary (casual vs. careful), but if style really is a continuum, these results could support the Continuity Hypothesis.

Style was also included as a factor in the finish variable in Australian Sign Language (Auslan). This variable is an instance of language change, and style was also modelled as binary (monologue vs. dialogue) (Johnston et al. 2015). however, in this case it was found not to be significant. If style is underlyingly continuous in Auslan as well, this finding would fit in with the observation from our language change data above: that continuous factors do not appear to constrain change variables.

However, style was also included as a factor in the study of South African English t-fronting, which
is observed to be language change. As with the previous two studies, style was modelled in a discrete way, in this case narrative vs. casual (Mesthrie 2012). It was also found to be significant. If style is continuous, then this finding is problematic for the Continuity Hypothesis: why, in this instances, is this continuous factor not slowing down the progression of language change? If, on the other hand, style is actually a discrete factor, then this finding does not go against the Continuity Hypothesis. Style being discrete would also not be problematic for the -ing findings above, either: -ing could still be constrained by another continuous factor.

There is also a third option, of course: that style can be either binary or continuous, depending on the variable. We have seen that manner of articulation and preceding vowel do not behave continuously on the change variables, but that phonological context does behave continuously for our stable variables. Perhaps, as with linguistic variables, style is free to affect some variables in a discrete way and others in a continuous way.

Conclusions

This meta-analysis has shown that there is potential for the Continuity Hypothesis: we have seen that most of the stable variables are affected by continuous linguistic factors. Conversely, the change variables are a) not constrained by linguistic factors existing on a continuous scale, and b) are affected only by factors that do not constrain their variables along a continuum. That is, even though these factors may seem as though they should be modelled as continuous, they do not behave as such. Additionally, these results indicate that the social factor style requires further investigation: in some cases it appears as though this factor may be continuous, while in others this factor appears to be discrete.

These results provide me with a point from which to proceed into my study of Egyptian possessive variation: they indicate that the Continuity Hypothesis has merit, and should be tested in-depth on a stable variable as well as a changing one. They indicate style should be included as a factor as well so that its effects on stable variation can be observed in more detail – a finding that also falls in line with the earlier Labov (2001) observation that stable variables are often associated with stylistic information. These findings also indicate that a) linguistic factors are the best choice for investigating the Continuity Hypothesis, and b) any given linguistic factor has the potential to be continuous or discrete, and should affect stable variables in a continuous way while affecting change variables in a discrete way.
1.3.4 Summary

Having situated Egyptian possessive variation within its Egyptian context, and having situated our understanding of language change and variation in the broader, sociolinguistic context, I can now move towards answering my original questions:

1. How can stable variation be distinguished from variation that leads to language change?
2. Is it possible to predict whether a given variable will remain stable, or lead to change over time?
3. Does data from 4,000 years ago and halfway across the world behave the same way as the modern English that has been the focus of most variationist analysis?

To achieve these goals, I required four components:

1. Time depth: in order to be sure that the stable variable is, in fact, stable, a long period of time is required.
2. Meta analysis: this situates the Egyptian stable variable in the context of other well-studied table variables and how they behave.
3. Comparing change and stable variables: investigating Egyptian possessives allows for comparison of the stable possessive variable with the language change possessive variable.
4. Necessary preliminary investigation:
   (a) syntactic analysis: making predictions based on structure
   (b) alienability and animacy study: showing variation
   (c) constant rate testing: the change variable is typical

This chapter has detailed the first two of these components: describing how Egyptian gives an appropriate context for investigating variation in general while also providing enough time depth for a study of stable variation, and situating the Continuity Hypothesis in the broader sociolinguistic context via the meta-analysis.

In order to achieve the main goal of this study, comparing a change variable with a stable one, I now move to the necessary preliminary investigation into Egyptian possessive variation: the syntactic analysis, the alienability study, and the constant rate testing. The chapter that follows will cover the syntactic account I propose for each possessive and demonstrative construction, as well as the diachronic morphosyntactic changes necessary for the innovative pA variant to emerge in demonstratives and spread
to clitic possessives. It is also in the syntax that I find my continuous factor: phrase complexity. The syntactic account is followed by the methodology chapter, which details not only my methods for statistical analysis in general, but also the second and third parts of the necessary preliminary investigation: the alienability/animacy study and its purpose for showing that variation exists. Finally, my results chapter will detail first my constant rate effect testing to demonstrate that clitic possessives are a typical language change variable, followed by my findings for part two – the main contribution of this dissertation, the comparison of a stable variable with a language change one.
Chapter 2

The Syntactic Connection

Before comparing language change and stable variation, we must understand the structure of each variant. This structural analysis provides the necessary information for understanding two main facets of Egyptian possessive variation: first, the general progression of the language change – how the innovative $p^3$ variant emerged in clitic possession via demonstrative $p^3$ – and second, how phrase complexity might act as a continuous factor (independent variable) constraining nominal possessive variation.

This chapter focuses first on the distribution of each possessive and demonstrative variant, followed by a syntactic analysis of each structure conducted within the Minimalist framework. I conclude with the predictions that follow from the syntactic account I propose, and what we should see in the statistical analysis as a result of these predictions.

2.1 The Distribution of the Variants

I begin with a detailed account of the distribution and uses of each variant of each variable, in order to situate the reader within the linguistic context of the variation, and to provide the linguistic information necessary for conducting the syntactic analysis that follows. A list of the abbreviations used in glosses can be found in (1).
First let us consider the two series of demonstrative articles present in Egyptian. The earliest attestations of any kind of demonstrative in Egyptian are a series of post-nominal demonstratives, listed in (2), with examples in (3). These can be found during the Old Egyptian stage of the language, which mostly takes place during the Early Dynastic Period and the Old Kingdom (c. 3100 BC – c. 2181 BC) (Allen 2010; Hoch 1997).

(3) a. hr pf
   enemy MSG.DEM
   ‘that enemy’
   (Gardiner 1957: 87)

b. hmw pf
   residence MSG.DEM
   ‘that residence’
   (Gardiner 1957: 87)
similar to the English ‘this’ vs. ‘that’ (Allen 2010; Hoch 1997; Gardiner 1957). This second set is also post-nominal, and maintains the same gender/number distinctions – \( p \) vs. \( t \) vs. \( n \) – as the previous set of demonstratives, but its final segment is an \( n \) rather than an \( f \). The forms in this set are listed in (4).

I refer generally to both of these two post-nominal sets of demonstratives as the \( pn \) variant, after the masculine singular form in the list below.

(4)

<table>
<thead>
<tr>
<th>Phi Features</th>
<th>Demonstrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>masculine</td>
<td>( pn )</td>
</tr>
<tr>
<td>feminine</td>
<td>( tn )</td>
</tr>
<tr>
<td>plural</td>
<td>( nn, , nn-n )</td>
</tr>
</tbody>
</table>

(adopted from Hoch (1994))

Examples of this demonstrative in use are illustrated in (5).

(5)  

(a) \( \text{hrd} \, \text{pn} \)  
child MSG.DEM  
‘this child’  
(Bardinet 1995: 33)

(b) \( \bar{s}t \, \text{tn} \)  
letter FSG.DEM  
‘this letter’  
(Collier and Quirke 2002: ii4)

Both sets of demonstratives can also appear on their own, similar to the English usage of solo, zero-noun demonstratives (e.g. ‘that is what I said’), shown below in (6).

(6)  

(a) \( \text{hr-s} \, \text{nn} \)  
after PL.DEM  
‘after this’  
(Gardiner 1981: 8,8)

(b) \( m \, \text{pf} \)  
in MSG.DEM  
‘in that’
While the first and second set of demonstratives can be found in the earliest Egyptian writings from the Old Kingdom, during the latter part of the Old Kingdom a second change took place: a set of pre-nominal demonstratives emerged. Listed in (7), I refer to this set of demonstratives as the $p^1$ variant, after the masculine singular form.

\[(7)\]

<table>
<thead>
<tr>
<th>Phi Features</th>
<th>Demonstrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>masculine</td>
<td>$p^1$</td>
</tr>
<tr>
<td>feminine</td>
<td>$t^1$</td>
</tr>
<tr>
<td>plural</td>
<td>$n^1$, $n^1_n$</td>
</tr>
</tbody>
</table>

(adapted from Hoch (1994))

An example of this variant with a noun is illustrated in (8).

\[(8)\] a. $p^1$y hrw
    MSG.DEF day.MSG
    ‘this day’
    (Luft 1992: vs.5)

This is the same set of demonstratives that eventually came to be used as part of the innovative $p^1$ variant of clitic possessives. Over time, this demonstrative also became a definite article, something Egyptian never had before this development (Allen 2010). Like the post-nominal demonstratives, the new pre-nominal demonstratives can appear on their own as well:

\[(9)\] a. hr $n^1$
    because-of PL.DEF
    ‘because of this’
    (Luft 2006: vs.1)

### 2.1.2 The Construct State Construction: $s^3$ $r^e$ & $pr.f$ possessives

Now we may move on to the four possessives. The first type is called the direct genitive by Egyptologists, and is actually comprised of two of the four possessive variants introduced in Chapter 1: one variant of the nominal possessive, and one variant of the clitic possessive. The nominal possessive variant is the
one I refer to as the *s r* possessive; it is composed of possessum + possessor (Allen 2010; Hoch 1997; Gardiner 1957), an example of which is shown in (10-a). I refer to it as the *s r* possessive due to the *s r* (‘son of Ra’) title held by kings of Egypt. The second related construction is the clitic possessive variant shown in (10-b), the one I refer to as the *pr.f* possessive, due to the fact that *pr.f* (‘his house’) this was the first example of this variant that I collected.

(10)  
a.  pr nswt  
   house.MSG king.MSG  
   ‘the king’s house’ (i.e. ‘the palace’)  
   (Smither and Gunn 1945: 6-7)

   b.  pr=f  
       house.MSG=3MSG  
       ‘his house’  
       (James 1962: doc.I)

Both *s r* and *pr.f* possessives may occur with or without modifiers, shown in (11-a-b) and (11-c-d), respectively. In (11-b), ‘following’ is modified by the demonstrative ‘this,’ and the entire possessive phrase is nested within another. The *pr.f* possessive is not attested with modifiers on the possessor – unsurprising, as the possessor is a clitic.

(11)  
a.  nb t\-wy  
    lord.MSG land.MDU  
    ‘lord of the two lands’  
    (Wente 1990: D407)

   b.  mdw=k  
       word.mpl=2MSG  
       ‘your (masc.) words’  
       (Parkinson 1997: 183)

   c.  h\-t p\-j šmsw juk  
       head.FSG MSG.DEM following.MSG 1SG  
       ‘the head of this following of mine’  
       (Spiegelberg 1917: 19)

   d.  wd\(t\)=f  
       wedjat-eye.2FSG=3MSG  
       ‘his 2 wedjat eyes’
s₁ r and pr.f possessives may also occur as nested constructions with other possessive variants. For example, (12-a) combines a s₁ r with a pr.f possessive, (12-b) combines a s₁ r and p₃ possessive, (12-c) combines a s₁ r and a nisbe possessive, and (12-d) combines two s₁ r possessives.

(12) a. p₁y=k h₃m nswt  
   MSG.DEM=2MSG servant.MSG king.MSG  
   'your king’s servant'  
   (Griffith 1898: 79)  

b. p₁ wb₃ p₁y=w n₄r  
   MSG.DEM court.MSG MSG.DEM=3PL god-MSG  
   'the court of their god'  
   (Spiegelberg 1917: 20-21)  

c. st hr(w) n(j)t anḥw  
   place.FSG Horus NISBE.FSG living.MPL  
   'the seat of Horus of the living'  
   (Petrie 1896)  

d. nb ns(w)t t₃wy  
   lord.MSG throne.FPL land.MDU  
   'lord of the thrones of the two lands'  
   (Griffith 1898: 80-81)  

The s₁ r possessive is also seen to occur with conjoined possessa and possessors (note the lengthy example in (13-b)).

(13) a. n₁-n n₄rw n₄rtyt nbw pr-r₃-msj-sw-mry-jmn  
   PL.DEM god.MPL goddess.FPL every.MPL Pirammesse-Meryamun  
   'all the gods and goddesses of Pirammesse-Meryamun'  
   (Janssen 1960: 37,44)  

b. m₁₃ t 1000 h(n)qt-ds 100 jw₃ 1 sntr p₃d 2  
   offering.MSG bread.MSG 1000 beer.FSG-jug.MSG 100 ox.MSG 1 incense.MSG  
   'a presentation of 1000 bread, 100 beer-jugs, 1 ox, and 2 incense cones'  
The *s r* possessive was also used to indicate time, characteristics, and nominalized actions, shown in (14-1-c). This is unsurprising, as these relations are frequently encoded with possessive morphosyntax, for example English makes use of phrases such as “the winter of our discontent.” The *pr.f* is attested for characteristics and nominalized actions as well, shown in (14-d-e).

(14)  
(a)  bd 4 prt  
month.MSG 4 peret-season.FSG  
‘month 4 of the peret-season’  
(month of the calendar)  
(Luft 1992: 1)

(b)  rnpwt  υtpt  
year.FPL  peace.FSG  
‘years of peace’  
(time + characteristic)  
(Griffith 1898: I.1)

(c)  wdwt  nbt  nb  
command.FPL  every.FPL  lord.MSG  
‘all the commands of the lord’  
(action)  
(Griffith 1898: 71-72)

(d)  jm+h=k  
dignity.MSG=2MSG  
‘your dignity’  
(characteristic)  
(James 1962: doc.III)

(e)  mdwt=sn  
saying.FSG=3PL  
‘their speech (lit. saying)’  
(action)  
(Helck 1955: 22)

And finally, the *pr.f* possessives are the Egyptian way of creating reflexives:

(15)  
(a)  ds=f  
self.3MSG  
‘himself’ (lit. ‘his self’)  
(Griffith 1898: 75-75)
2.1.3 Clitic Possessors & $p^1$ Possessives

The possible pronominal possessors in the $pr.f$ possessive – the clitic version of the $s^3$ $r^1$ possessive – are as follows:

\begin{enumerate}
\item[(16)]
\begin{tabular}{|c|c|}
\hline
Phi-features & Clitic \\
\hline
1sg & 1 \\
2msg & k \\
2fsg & t, t \\
3msg & f \\
3fsg & s, st \\
1pl & n \\
2pl & tn, tn \\
3pl & sn, w \\
\hline
\end{tabular}
\end{enumerate}

(Allen 2010: 32)

I treat these pronouns as clitics for several reasons. First, they do not appear independently – they must always attach to the right end of words. Second, they can cliticize onto verbs and prepositions as well as nouns. Finally, they fit into a series of three pronoun types as the “weakest” pronoun, as per the Cardinaletti and Starke (1994) pronoun hierarchy (Gardiner 2012).

I treat the $pr.f$ possessive as a separate variant from its nominal counterpart, the $s^3$ $r^1$ possessive, for two reasons. First, as we will see, the two constructions have some small structural differences, though their overall structure is the same. Second, my previous pilot study indicates that clitic possessive variation differs from nominal possessive variation (Gardiner 2017) – i.e. nominal and clitic possession are two different variables, which I also show in the remainder of this chapter and the ones to follow – which means that the variants of each variable cannot be considered to be completely equivalent.

I now turn to the third possessive type. It also has a clitic possessor, but is constructed using the pre-nominal demonstrative/definite article, the $p^1$ set of demonstratives – hence the name I give this variant, the $p^1$ possessive. An example of the demonstrative on its own is shown in (17-a), and the $p^1$ possessive itself in (17-b).
Chapter 2. The Syntactic Connection

(17) a. t³子弟
   FSG.DEM letter.FSG
   ‘this letter’
   (Wente 1990: 13,77-78)

   b. t³yk子弟
   FSG.DEM=2MSG letter.FSG
   ‘your (masc.) letter’
   (Spiegelberg 1917: 11-13)

The pre-nominal demonstrative article used in the p³ possessive cannot occur with the pr.f possessive, indicating that the only difference between the pr.f and p³ possessives is the presence of the pre-nominal demonstrative. Similarly to the pr.f possessive, the p³ possessive can be nested with the s irrational possessive:

(18) a. п³ykὴμnσωτ
   DEM.2MSG servant-MSG king-MSG
   ‘your king’s servant’
   (Griffith 1898: 79)

   b. t³yjdανɲδσωτ
   DEM.1SG portion-MSG silver-MSG
   ‘my portion of the silver’
   (Spiegelberg 1917: 18)

The p³ possessive also allows the possessum to be modified, as in (19), but like its pr.f possessive counterpart is not attested with modifiers of the possessor – not surprising since the possessor is always a clitic.

(19) a. ἡρωσκ
   day.MSG=2MSG beautiful.MSG
   ‘your (masc.) beautiful day’
   (Luft 1992: Let.1)

   b. п³ynἈδοκ
   MSG.DEM=1PL lord.MSG good.MSG
   ‘our good lord’
   (Cerny 1935: pl.74)
Lastly, like the *pr.f* possessive, the *p* possessive is also used to describe actions or traits:

(20) a. p\(y=f\) wbn
    MSG.DEM=3MSG rising.MSG
    ‘his rising’
    (Janssen 1960: 36)

b. p\(y=f\) h\(t\)p
    MSG.DEM=3MSG peace.MSG
    ‘his peace’
    (Janssen 1960: 36)

c. p\(y=f\) s\(w\)
    DEM=3MSG satiety.MSG
    ‘its satiety’
    (Pleyte and Rossi 1869: pl.32-33)

As shown in all of these examples, the addition of the *p* demonstrative changes the word order of this construction from the possessum + possessor order seen in the *pr.f* possessive variant – in the *p* possessive, the possessor precedes the possessum. There is no equivalent for this in the nominal possessive construction, another indication that the *pr.f* possessive is not as exact a copy of the *s* possessive as it appears on the surface.

2.1.4 Adjectival Possession: The *nisbe* Possessive

The possessive marker *nj* characterizes the fourth possessive construction, the second variant in the nominal possessive variable. This marker, called a *nisbe* by Egyptologists, makes this construction rather different from the previous three possessive types. An example of *nisbe* possession is shown in (21).

(21) a. h\(z(w)\)t \(n(j)\)t m\(n\)tw
    favour.FSG NISBE.FSG Montu
    ‘the favour of Montu’
    (James 1962: doc.II)
This construction, like the $s^v \text{ r}^c$ possessive, has possessum + possessor word order. But the nisbe construction also contains a special morpheme preceding the possessor, which is not found in the $s^v \text{ r}^c$ possessive. This morpheme appears to function similarly to the English preposition ‘of’, but it is actually what is known to Semitic scholars as a nisbe – a word of one lexical category that is made from a word of a different lexical category. In this case, the true preposition in Egyptian is $n$, meaning ‘to’ or ‘for.’ The nisbe that derives from $n$ means ‘belonging to,’ and it is created by adding Egyptian adjectival suffixes, which must agree in gender and number with the possessum (Hoch 1997: 31). This type of possessive does not occur with clitics, but either clitic possessive may occur within the possessor, as in (22-a,d), or in the possessum, as in (22-b,c,e).

(22) a. pr=f n(j) nbsyt
   house.MSG=MSG.3MSG NISBE.MSG Nebsyt
   ‘his household of Nebsyt (a place)’
   (James 1962: doc.I)

   b. qy n(j) wmn=j
   shape.MSG NISBE.MSG being.MSG=1SG
   ‘the shape of my being’
   (James 1962: doc.II)

   c. hz(w)t n(j)t k4=f
   favour.FSG NISBE.FSG k4.MSG=3MSG
   ‘the favour of his ka’
   (Griffith 1898: 76-77)

   d. n-n htht n(j) p:j=s
   PL.DEM inquiry.FPL NISBE.MSG MSG.DEM=1SG brother.MSG
   ‘these inquiries of my brother’
   (Peet 1960: pl.6-9)

Similarly, nisbe possessive may also include a $s^v \text{ r}^c$ possessive, as in (23).

(23) a. znb&w n(j) w^b nswt
   failure.MPL NISBE.MPL wab-priest.MSG king.MSG
   ‘the failures of the wab-priest of the king’
   (Luft 2006)
Since *nisbe* possession occurs only with a full nominal possessor and possessum, it can also be used instead of the *s r* possessive, as in (24).

(24) a. ḥz(w)t n(j)t kꜣ=f
    favour.FSG NISBE.FSG ka.MSG=3MSG
    ‘the favour of his ka’
    (Griffith 1898: 76-77)

   b. ḥz(w)t p* jtn
    favour.FSG .DEM Aten
    ‘the favour of the Aten’
    (Peet 1960: pl.12-15)

Either the possessor or possessum in *nisbe* possession may be modified. Examples of a modified possessum are shown in (25).

(25) a. ḥnw nb n(j) jnpw
    jar.MSG every.MSG NISBE.MSG Anubis
    ‘every jar of Anubis’
    (James 1962: doc.II)

   b. šḥt nfrt qbt n(j)t ḫpšyt
    field.FSG beautiful.FSG cool.FSG NISBE.FSG Khepshyt
    ‘the beautiful, cool field of Khepshyt’
    (James 1962: doc.II)

   c. sšm nb nfr n(j) nb
    disposition.MSG every.MSG good.MSG NISBE.MSG lord.MSG
    ‘every good disposition of the lord’
    (James 1962: doc.XVIII)

Examples with modified possessors are shown in (26).

(26) a. s n(j) niwt tn
    man.MSG NISBE.MSG town.FSG MSG DEM
    ‘a man of this town’
    (Collier and Quirke 2002: 16-17)
b. \( \text{md(w)t } n(j)t \quad zh(w) \quad \text{pl} \)
\( \text{saying.PL NISBE-FPL letter-MSG DEM} \)
\( \text{‘the words (lit. sayings) of this letter’} \)

(Collier and Quirke 2002: 4-5)

And an example where both possessum and possessor are modified is given in (27).

(27) a. \( \text{m-hrt-hrw } nt \quad r\cdot w \quad \text{nb} \)
\( \text{daily-course.FSG NISBE.FSG day.MSG every.MSG} \)
\( \text{‘the daily course of every day’} \)

(Griffith 1898: 71-72)

Once the language developed the \( p\) set of demonstratives, they began to appear in \( nisbe \) possessives as well: an example in the possessor is shown in (28-a), in the possessum in (28-b), and in both in (28-c).

(28) a. \( \text{t\cdot b\cdot kt } n(j)t \quad \text{pr} \)
\( \text{MSG.DEM servant.FSG NISBE.FSG house.MSG} \)
\( \text{‘the servant of the household’} \)

(James 1962: doc.I)

b. \( \text{b\cdot kw } n(jw) \quad n\cdot n \quad h\text{mwt} \)
\( \text{task.MPL NISBE.MPL DEM servant.FPL} \)
\( \text{‘the tasks of these servants’} \)

(Luft 1992: Let.1)

c. \( \text{n\cdot prw } n \quad n\cdot \quad \text{srw} \)
\( \text{PL.DEM house.MPL NISBE.MSG PL.DEM nobleman.MPL} \)
\( \text{‘the houses of the noblemen’} \)

(Griffith 1898: pl.39)

Additionally, several \( nisbe \) possessives can be stacked onto each other:

(29) a. \( \text{jr\cdot t } n(j) \quad h\text{sbw } n(j) \quad hr(j)-h\text{b(t)} \)
\( \text{portion.MSG NISBE-MSG settlement.MSG NISBE.MSG lector-priest.MSG} \)
\( \text{‘the portion of the settlement of the lector-priest’} \)

(Luft 2006)

b. \( \text{p\cdot jth } n \quad p\cdot \quad \text{srj } n \quad s\cdot \quad (j)m(j)-r\quad \text{pr} \quad hd} \)
\( \text{MSG.DEM prison.MSG NISBE.MSG MSG.DEM son NISBE.MSG MSG.DEM overseer.MSG house.MSG silver.MSG} \)
Chapter 2. The Syntactic Connection

48

‘the prison of the son of the overseer of the house of silver (treasury)’

(Janssen 1960: 45)

c.  rn=f n jb nfr n h t n šwb
name=3MSG NISBE.MSG tree.MSG good.MSG NISBE.MSG wood NISBE.MSG persea.MSG
‘his/its name of the good tree of the wood of the persea (a type of tree)’

(Pleyte and Rossi 1869: pl.32-33)

And conjoined possessors or possessa are also possible. The former is shown in (30-a), while the latter is found in (30-b). An example with both is shown in (30-c).

(30) a. jrj=t n jwj hmw n š pr ‘
administrator.MSG NISBE.MSG aviary.MSG NISBE.MSG garden.MSG house.MSG great.MSG
‘administrator of the aviary and of the gardens of the palace’

(Luft 2006)

b. qnt n h< t n p r w nfr n t nb
valour.MSG strength.MSG NISBE.MSG MSG DEM sun.MSG good.MSG NISBE.MSG land.MSG every.MSG
‘the valour and strength of the good sun of every land’

(Pleyte and Rossi 1869: pl.32-33)

c. s nb n(j) h< w=f n hrw n(jw) jt(j).f n(jt)
man.MSG every.MSG NISBE.MSG area=3MSG NISBE.MSG relative.MSG NISBE.MSG father=3MSG NISBE.MSG
mother=3MSG
‘every man of his area or of the relatives of his father and mother’

(Petrie 1896)

Finally, the possessive nisbe is also used to indicate quantities of items or units of measurement, descriptions of time, and to describe place of origin or group membership.

(31) a. hqt 1 jm n(j)t jt-mh(j)
bushel 1 therein NISBE.FSG barley
‘a bushel, there, of barley’ (measurement)

(James 1962: doc.1)

b. hrw=t n(j) nh
day.MSG=2FSG NISBE.MSG life e
‘your days of life’ (time)

(Møller 1909: 13-15)

c. tr n(j) mšr(w)
time.MSG NISBE.MSG evening.MSG
Chapter 2. The Syntactic Connection

49

‘the time of evening’
(Smither and Gunn 1945: pl.2-2a)

d. ḥḥw n(j)w rnpt
   million.PL NISBE.MPL year.FSG
‘millions of years’
(Wente 1990: 196)

e. ḥ>tj-a n gbtw
   mayor.MSG NISBE.MSG Gebtu
‘mayor of Gebtu’
(Petrie 1896)

f. z n(j) nt tn
   man.MSG NISBE.MSG town.FSG FSG.DEM
‘a man of this town’
(Collier and Quirke 2002: 16-17)

2.2 Analysis

Having provided the first detailed distribution of each possessive and demonstrative variant, I can now move forward to the syntactic analysis portion of the chapter.

My analysis will be conducted within the framework of the Minimalist Program. The Minimalist Program, a generative approach to syntax, was first proposed by Chomsky (1993), and its purpose was to remove complications from its predecessor, Government and Binding Theory (GB). The program’s goal is to describe how language is represented structurally, and what common structures exist across languages – essentially, to show whether Universal Grammar exists, and what it might look like if it does.

In Minimalism, the syntax interacts with two interfaces: phonological and semantic. First, the syntactic structure is created; once this structure is sufficiently complete, it is sent to the PF (phonological) and CF (semantic) interfaces (Chomsky 1993). The structure itself is created via three operations: Merge, Move, and Agree. Merge is what builds the syntactic tree: two elements are joined together, and then a third can be merged with those two, and then a fourth with those three, and so on in a binary-branching fashion (Chomsky 1995, 1993). That is, two elements are combined into an unordered
set, which receives the label of one of the elements – the label is the phrase “head.” This bottom-up model of phrase-building is known as bare phrase structure, and contrasts with GB phrase structure, which was typically created in a top-down fashion (Chomsky 1995, 1993). Similarly, GB phrases were required to have a specifier, head, and complement, but bare phrase structure imposes no such structural requirements – it needs only a phrasal head, or terminal, for each phrase (Chomsky 1995, 1993).

The operations Move and Agree arise because of features. Features are the information that lexical items (words) bear. For example: definite, masculine, and plural are all examples of features. Some features are interpretable, meaning they remain as they are on the lexical item; other features are uninterpretable – they require checking/valuing before the syntactic structure can be spelled out (Matushansky 2006; Chomsky 2001, 1995, 1993). Some types of uninterpretable features can be valued via agreement, while other types of uninterpretable features may require movement to be valued (Matushansky 2006; Chomsky 2001, 1995, 1993). The latter is the type of feature valuing operation I focus on in my Egyptian account: the movement of one syntactic element from its original position in the tree to a position higher up in the tree to value an uninterpretable feature.

The notion of features is extended further in Distributed Morphology, a framework that functions within the Minimalist Program (Halle and Marantz 1993). The central idea of Distributed Morphology (DM) is that words, phrases, and sentences are all constructed via the same syntactic operations. That is, even words are created via operations such as Merge. In addition to two words combining, DM allows for components of each word to merge in a similar fashion: a noun may combine with a gender suffix, for example. This is possible because in DM all lexical elements are simply bundles of features: that noun is not a noun, but rather a bundle of semantic features with no lexical category, a root – which only becomes a noun once it merges with the nominalizing head, the gender suffix in this hypothetical example (Halle and Marantz 1993).

In the chapter that follows, I show how these concepts will be applied to others’s work on Afroasiatic languages similar to Egyptian, as well as to my own study of Egyptian possession. I begin my analysis by providing a brief summary of previous literature analyzing Egyptian possessives (and demonstratives), followed by an overview of syntactic accounts of other Afroasiatic languages’ possessive constructions. I then propose, based on these solid foundations, my own analysis of each Egyptian variant.

2.2.1 Egyptian Possession in the Literature

Egyptian possessive constructions have mostly been discussed in terms of their semantic differences: Kammerzell (2000) provides a descriptive account of the possessive system in Ancient Egyptian, and
posits that the choice among the possessive constructions depends on the possessum's alienability or inalienability.

For Old Egyptian and Middle Egyptian, the claim is that the *s rt* possessive and the *pr.f* possessive were used to indicate possession of nouns that are semantically inalienable. This split is defined in Kammerzell (2000) in the generally accepted semantic way used in most linguistic work, wherein inalienable nouns are those possessa that cannot be (or generally are not) separate from their possessor. This includes names, family members, and body parts (Kammerzell 2000). For example, according to Kammerzell’s (2000) analysis, “my name” would be semantically inalienable and therefore would always require the direct genitive.

In contrast, semantically alienable possessa would require the *nisbe* possessive construction. Kammerzell (2000) does not make mention of the *p* possessive existing at all in Middle Egyptian – though the data collected for this project indicate that it was in use during that period, as do other Egyptian grammars (Allen 2010; Hoch 1997; Gardiner 1957).

By Late Egyptian, Kammerzell (2000) describes the system as having changed such that, while alienable nouns still require the *nisbe* possessive, they may also take the *p* possessive if their possessor is a clitic. At this point, semantically inalienable nouns are still said to allow only the construct state or *pr.f* possessive (Kammerzell 2000). Kammerzell (2000) maintains that “even a superficial glance at possessive constructions in Late Egyptian supports [this] hypothesis” (Kammerzell 2000: 100). Late Egyptian grammars align with Kammerzell’s (2000) claim here: Junge claims it is because such nouns cannot occur with any kind of article, including the “false” article (the demonstrative) that makes up the *p* possessive (Junge 2005).

As for the *p* demonstrative itself, Kupreyev (2013) finds that it is first attested in the tomb inscriptions at Hamra (near modern-day Luxor in Upper Egypt), written during the 6th Dynasty (c. 2345 BC - 2181 BC) – the last dynasty of the Old Kingdom (c. 2686 BC - 2181 BC). Edel (1955) also finds instances of *p* during the 6th dynasty, and observes that these *p* forms are, at least at first, used to describe captions of everyday life scenes.

Kupreyev (2013) explores the semantic change of the article from demonstrative in its earliest usage to definite article by the time the Egyptian language fell out of use. Based mainly on frequency of use in various texts and word-order changes in other aspects of the language (such as verb-subject order, the use of auxiliaries, etc), and the semantic bleaching of *w* (‘one’) to the role of indefinite article, Kupreyev (2013) claims that the variation between demonstrative and definite article begins in earnest in Dynasty 18 (c. 1543 BC - 1292 BC), during and after the Amarna Period (c. 1351 BC -1334 BC). To measure this variation, he describes the slightly differing spellings that are visible, e.g. *p* vs. *p* y, with the -y
variant being the demonstrative and the ∅ variant being the definite article. However, it is not clear whether this spelling difference accurately reflects demonstrative vs. definite article distinctions, since spelling differences were not uncommon in Ancient Egyptian (Allen 2010).

A look at Egyptological work on the final stage of the Egyptian language, Coptic, reveals a similar semantically driven approach: Egedi’s (2010) work discusses the difference between the Coptic equivalent of the $p^t$ and $pr.f$ possessives. She asserts that inalienable nouns require the $pr.f$ while alienable nouns make use of the $p^t$ possessive (Egedi 2010). Her discussion does not include the *nisbe* possessive except to contrast it with the $s^t \, r^t$ possessive in Old Egyptian and Middle Egyptian, making the same assertions here as Kammerzell (2000) does: that in Old and Middle Egyptian, the *nisbe* possessive was used for semantically alienable nouns and the $s^t \, r^t$ possessive was used for inalienable nouns (Egedi 2010). She describes the $s^t \, r^t$ possessive as a construct state construction, like similar constructions in Semitic languages – Hebrew, for example (Ritter 1988).

A construct state noun is defined as semantically definite but lacking any overt definite article, is often phonetically shortened – as in Hebrew (Ritter 1988) – and in possession, it is directly modified by another noun (its possessor) with no intervening adjectives between the two nouns (Egedi 2010; Ritter 1988). Construct state possessives in other Afroasiatic languages are, generally speaking, derived via head movement to Determiner (D) (El Hankari 2014; Gebregziabher 2013; Danon 2008; Hoyt 2008; Creissels 2009; Matushansky 2006; Shlonsky 2004; Kim 2000; Borer 1996; Siloni 1997; Ritter 1991; Shlonsky 1990). Egedi does not mention the *nisbe* possessive in her discussion of Coptic, but if we combine her work with Kammerzell’s (2000), we can predict that it should not behave like a construct state construction, in that its structure should not involve head movement to D, as both possessor and possessum in the indirect genitive can be modified by adjectives and articles.

If these accounts of Egyptian are correct, then the $s^t \, r^t$ possessive is a construct state construction, and there should be a correlation between semantic alienability and syntactic structure. That is, the $s^t \, r^t$ possessive should behave the same way morphosyntactically as construct state constructions in other Semitic languages do, and it should also occur only with semantically inalienable possessa. Additionally, the $p^t$ possessive and the *nisbe* possessive should not behave like construct state constructions, and should occur only with semantically alienable possessa. These semantic claims heavily imply that there is, in fact, no variation between variants in either nominal or clitic possession.

However, we can begin to falsify some of these predictions almost immediately. The data from the Egyptian letters show instances of the same noun appearing in different possessive constructions, indicating that semantic alienability, which should remain constant for a given possessum, does not
correlate with possessive structure. For example, in (32-a) and (32-b) the word 'lord' occurs with the s\textsuperscript{i} r\textsuperscript{s} possessive, while in (32-c) it occurs with the p\textsuperscript{s}. While one could argue that the relation between a person and their lord is different from the relation between a place (Thebes) and its lord, we also see other words with different types of possessive. In (32-d) the word 'favour' occurs with the s\textsuperscript{i} r\textsuperscript{s} possessive, while in (32-e) it appears with the nisbe possessive.

(32) a. \begin{align*}
    \text{nb}=f \\
    \text{lord.MSG}=3\text{MSG} \\
    \text{‘his lord’} & \quad (pr.f \text{ possessive}) \\
    \end{align*}
    (James 1962: doc.I)

b. \begin{align*}
    \text{nb} \quad \text{w=s t} \\
    \text{lord.MSG Thebes} \\
    \text{‘lord of Thebes’} & \quad (s\text{i} \text{ r}\text{s} \text{ possessive}) \\
    \end{align*}
    (James 1962: doc.II)

c. \begin{align*}
    \text{p\textsuperscript{y}=j} \quad \text{nb} \\
    \text{MSG.DEM=1SG lord.MSG} \\
    \text{‘my lord’} & \quad (p\text{s} \text{ possessive}) \\
    \end{align*}
    (Collier and Quirke 2002: 84-85)

d. \begin{align*}
    \text{hz(w)t} \quad \text{jmn-r\textsuperscript{w}} \\
    \text{favour.FSG Amun-Ra} \\
    \text{‘the favour of Amun-Ra’} & \quad (nisbe \text{ possessive}) \\
    \end{align*}
    (Janssen 1960: 40)

e. \begin{align*}
    \text{hz(w)t} \quad \text{n(j)t} \quad \text{nsw-bjt(j)} \\
    \text{favour.FSG nisbe.FSG king.MSG-land.MDU} \\
    \text{‘the favour of the dual-king (lit. king of Upper and Lower Egypt)’} & \quad (s\text{i} \text{ r}\text{s} \text{ possessive}) \\
    \end{align*}
    (Collier and Quirke 2002: 30-31)

Setting aside for the moment the question of whether the constructions have systematic semantic properties – the existence of variability and the potential for alienability distinctions will be discussed in the next chapter – I now turn to a brief overview of previous syntactic accounts of other Afroasiatic possessive constructions, followed by my own syntactic analysis of each possessive and demonstrative variant. The structures proposed in the section below will allow me to make predictions about the nature of each
variable, which will then be tested in the statistical analyses that follow this chapter.

### 2.2.2 The Syntax of Possessives

The earliest account of an Afroasiatic language’s possessive constructions that is still relevant today is Ritter’s (1988) account of Hebrew possession. The account of Hebrew possession has seen several iterations (Danon 2008; Shlonsky 2004; Siloni 1997; Borer 1996; Ritter 1991), but its essence remains: head movement. That is, the movement of one syntactic head to another. In more recent accounts of other Semitic languages based on Ritter (1988) and/or elaborations on Ritter (1988), for example in (Gebregziabher 2013), head movement is said to occur as per Matushansky (2006): a syntactic Move operation occurs from a head to a specifier position, followed by a morphological merger (m-merger) into the head itself. For the purposes of this account of Egyptian possession, this combination of operations will be treated as a whole, and referred to simply as head movement.

The head movement required in Hebrew possession is the movement of a lower noun (the possessum) into the highest D head in the projection (Danon 2008; Borer 1996; Siloni 1997; Ritter 1991; Shlonsky 2004; Ritter 1988). This movement gives the construction the surface order of possessum + possessor: the same order evident in the $s\overset{r}{\rightarrow}$ and $pr.f$ possessives in Egyptian. The type of possessive with this word order in Hebrew is referred to by Ritter (1988) as the construct state construction, as is the Coptic equivalent of the Egyptian $s\overset{r}{\rightarrow}$ possessive (Egedi 2010). Indeed, possession in the form of a construct state construction is prevalent in Afroasiatic languages: it can also be found in Akkadian (Goldenberg 2013; Deutscher 2001), Arabic (Hoyt 2008), Berber (El Hankari 2014; Creissels 2009), and Wolof (Kim 2000), among others.

In order for the head movement to occur in the construct state construction, there must be some motivation. This is true of any head movement: it always requires some motivation (Matushansky 2006; Chomsky 1995). For Hebrew, Ritter (1988) argues that this motivation is an unvalued definiteness feature on the topmost D head. This feature finds the possessum, which moves upwards into D head, and the feature is valued.

Each Afroasiatic language differs in the details of this account – for example, Standard Arabic has nominative (for the possessum) and genitive (for the possessor) suffixes for its construct state possessive constructions (Hoyt 2008), while for Tarifit Berber the movement is analyzed via Distributed Morphology as a post-syntactic movement El Hankari (2014) rather than one occurring within the narrow syntax as proposed by Ritter (1991, 1988) for Hebrew. However, the notion of head movement recurs. Therefore, it is from this idea that I form the basis of my account of Egyptian possession, and in the remaining
sections of this chapter it will be made clear that this basis accounts for the Egyptian data. This analysis will also discuss the continuous factor for testing the Continuity Hypothesis: phrase complexity.

2.2.3 Determiner Phrases

In order to propose a structure for the demonstratives, we must first deal with nominals and how they are structured before any modifiers are added. So to begin, I propose that Egyptian nominals include a Determiner Phrase. This is similar to the Ritter (1991, 1988) accounts of Hebrew nouns as well as the myriad other accounts of various Semitic languages (El Hankari 2014; Goldenberg 2013; Hoyt 2008; Creissels 2009; Deutscher 2001; Kim 2000).

Ritter (1988) begins by motivating the Determiner Phrase (DP) analysis for Hebrew (see also Abney (1987); Cowper (1987)). What this means is that, for example, in English phrases like the barbarians, the Determiner the is the head of the phrase rather than the noun barbarians. The DP is thus the maximal projection of the functional category, D (determiner). This is illustrated in (33).

(33) DP
    /\                
   D   NP
      |      |
     the     N
          |   barbarians

Next, we must also consider that Egyptian, like its Semitic language relatives, is a root-based language. This is evident from the consonantal root system that is obvious even from hieroglyphs: recall that Egyptian, like Arabic, is based on a root system, with mono-, bi-, tri- and quadriliteral roots; some hieroglyphs represent a single consonant, while others may represent two, three, or four consonants. Like any other root-based language, each Egyptian root can be made into essentially any lexical category by adding the appropriate affix(es). With that said, in order to create any Noun Phrase, we will require n: since Ritter (1988), the VP has been decomposed into smaller pieces, and DP along with it. In VP, these pieces are a higher vP that selects an external argument (among other things), and a lower, lexical VP. vP has proven itself to be a useful part of syntactic structure – for example, it allows us to explain cross-linguistic data on causatives (Folli et al. 2007) and light verbs (Folli and Harley 2013). In more recent years, Distributed Morphology has made use of v and its parallel n as verbalizing and nominalizing heads, respectively (Marantz 2001). These heads combine with a category-neutral root to make a lexical category like a verb or a noun, and the n head is also sometimes claimed to carry nominal
gender (Kramer 2014). So $n$, for Egyptian, will be used to create a noun from a root, as follows:

(34) 
\[
\begin{array}{c}
\text{n} \\
\sqrt{\text{root}} \quad n \\
| \\
| \\
t + \emptyset \\
\end{array}
\]

Next, recall that Egyptian has Number suffixes. Therefore, I propose that Egyptian, like Semitic languages (Ritter 1992), has another functional projection within the DP: Number head (Cowper 1999; Ritter 1992). The complex $n$ head proposed in (34) will move from its original position low in the tree, as shown in (35) (Cowper 1999; Ritter 1992). This gives the various singular, dual, and plural gender suffixes we see on Egyptian nouns.

(35) 
\[
\begin{array}{c}
\text{NumP} \\
\text{Num} \quad nP \\
| \\
| \\
n \quad \text{Num} \quad \langle n \rangle \\
| \\
| \\
t + \emptyset \quad \text{-wy} \\
\end{array}
\]

Now recall that the pre-nominal demonstrative does not yet exist – that is, there is no possibility for something determiner-like fill the head in DP. In this structure, the Determiner head exists, but is phonologically null. I propose, as per Gardiner (2015a), that this D head carries the uninterpretable features $uN$ and $uDefinite$, where $uN$ attracts the nominal head, now in Number Phrase, while $uDef$ agrees with $n$ to value its definiteness. This results in the combined $n + \text{Num}$ moving up into D (Gardiner 2015a). The resulting DP structure is shown in (36):

(36) 
\[
\begin{array}{c}
\text{DP} \\
\text{D} \quad \text{NumP} \\
| \\
\text{hrw} \quad \langle \text{Num} \rangle \quad nP \\
| \\
| \\
\langle n \rangle \\
\end{array}
\]
2.2.4 Demonstrative Phrases

I propose that post-nominal demonstratives are heads of a separate projection, which I will call Demonstrative Phrase (DemP). I propose that DemP is a modifier adjoined to DP rather than an adjunct to nP as adjectives are. As adjectives agree with their nouns, demonstratives agree with their determiners – but they do not have the same agreement affixes as adjectives do. Adjective agreement suffixes are shown in (37).

(37) Adjective Agreement Suffixes

<table>
<thead>
<tr>
<th>Number</th>
<th>Feminine</th>
<th>Masculine</th>
</tr>
</thead>
<tbody>
<tr>
<td>singular</td>
<td>-yt, -jt, -t</td>
<td>-y, -j, ∅</td>
</tr>
<tr>
<td>dual</td>
<td>-yty, -ty</td>
<td>-ywy, -wy</td>
</tr>
<tr>
<td>plural</td>
<td>-ywt, -wt, -t</td>
<td>-yw, -w</td>
</tr>
</tbody>
</table>

(adapted from Hoch 1994)

As illustrated here, these suffixes are quite different from the prefixes associated with all three types of demonstrative, so we can rule out an adjectival account. Instead, since they are a different lexical category – demonstratives – they have their own agreement markers, which in this case are the agreement prefixes indicated in the previous examples. This is consistent with the morphology of Egyptian: recall that any word can be created from a root (or from another lexical category as is the case with the nisbe) by adding the appropriate affix from the desired lexical category.

If DemP is indeed adjoined to DP as proposed by this account, we should see the surface order n + Num + Dem – which is exactly the what the data reveal.

(38) a. hrw pn
    day.MSG MSG.DEM
    ‘this day’
    (Wente 1990: 85)

For example, (39) shows the demonstrative construction in (38) broken down into its individual components:
Given the surface order, it is also possible that DemP is adjoined to NumP, but its position adjoined to DP is more likely, given the diachronic trajectory of Dem discussed below.

**The Pre-Nominal Demonstrative: A Syntactic Reanalysis**

Now we may proceed to accounting for the set of pre-nominal demonstratives. Since they are exactly where we would expect the Determiner head to be located, I propose that they do end up in D – eventually. Their final form, which I propose only appears post-19th Dynasty, will be as follows:

(a) \[ \text{p'y hrw} \]

\[
\begin{align*}
\text{MSG.DEM day.MSG} \\
\text{‘this day’}
\end{align*}
\]

(Wente 1990: 60-62)

However, what I propose for these demonstratives happens in two stages. In the first stage of development, this set is composed of true demonstratives. These are located in a Demonstrative Phrase, as post-nominal demonstratives are, but they have become a different part of the structure. That is, in this first stage of development, one small diachronic change in Egyptian grammar occurs: the change in
the Merge position of DemP from adjunct of Determiner Phrase to specifier of Determiner Phrase. This new structure is illustrated in (41).

a. p<sub>y</sub> hrw
data.MSGMSG
‘this day’

(Wente 1990: 60-62)

In this account, phonologically empty D has the same effect as before: D head carries the uninterpretable features uN and uDefinite, where uN attracts the nominal head, now in Number Phrase, while uDef agrees with n to value its definiteness. I propose that any DP with phonologically empty D triggers movement to value these two features. The result is that the n in Num moves up into D, as before.

Finally, in the last stage of this evolution, Dem head is reanalyzed as Determiner head. This is when the demonstrative becomes a definite article. In constructions where the pre-nominal demonstrative/definite article is present, there is no need for the post-nominal adjoined demonstrative, so it simply does not occur. The two DemPs – pre- and post-nominal – thus compete for usage, and the post-nominal DemP disappears before DemP moves into D. The change of the post-nominal demonstrative adjunct, to demonstrative specifier of DP, to definite article in D, not only changes its meaning but also its structure – an illustrative example of syntactic reanalysis.

This account leads me to propose the following stages of the Egyptian article development. By the end of this chapter, these stages will include all four possessive variants and both demonstrative variants, along with what this means for the quantitative results in the next chapter.

1. Stage I: only post-nominal demonstratives; Egyptian has no overt Determiner.

2. Stage II: post-nominal demonstratives still exist, but Egyptian develops pre-nominal DemP in the specifier of DP. Still no overt D. The two DemPs are in competition.
3. Stage III: Pre-nominal DemP in the specifier of DP replaces post-nominal adjunct DemP. Dem starts to be reanalyzed as D.

4. Stage IV: D analysis of pre-nominal form out-competes Dem analysis, and all pre-nominal forms are analyzed as D.

### 2.2.5 Construct State Constructions: The $s_{\text{r}}$ Possessive

Now that I have established the structure of Determiner Phrases and Demonstrative Phrases, we can move to possessive constructions. Ritter (1988)'s Determiner phrase also provided a structural account of possessives. Her example of the structure for the English phrase *the barbarians' destruction of Rome* is illustrated in (42):

\[
(42) \quad \begin{array}{c}
\text{DP} \\
\downarrow \\
\text{DP} \\
\downarrow \\
\text{the barbarians} \\
\downarrow \\
\text{D} \\
\downarrow \\
\text{s} \\
\downarrow \\
<\text{the barbarians}> \\
\downarrow \\
\text{NP} \\
\downarrow \\
\text{N} \\
\downarrow \\
\text{destruction} \\
\downarrow \\
\text{of} \\
\text{Rome}
\end{array}
\]

(Ritter 1988: 913)

The DP analysis for both unpossessed and possessed nouns has become widely accepted since Ritter’s (1988, 1992) work. One of the major insights that comes from this account is that nominal structure parallels the structure of clauses: *the barbarians* originates in the specifier position of Noun Phrase and moves to specifier of Determiner Phrase in order to receive genitive case – in the same way that the subject of a clause begins in specifier of Verb Phrase and moves to specifier of Inflectional Phrase in order to receive nominative case (Ritter 1988). Now I will adapt this to Egyptian.

Recall that the Egyptian $s_{\text{r}}$ possessive can occur with a pronominal or nominal possessor. Having previously observed the distribution of this variation, we can see some similarities between the nominal version of the direct genitive and the Hebrew construct state construction (Ritter 1992, 1988), illustrated
in (43):

(43) a. beyt ha-mora
    house the-teacher
    ‘the teacher’s house’

(Ritter 1988: 915)

A more detailed version of this structure, updated to include a Number projection and incorporate the root-based nature of Hebrew, is shown in (45). Notice the similarities to Egyptian now that we have added the NumP and the roots.

(45)

Now consider the following Egyptian phrase:

(46) a. nb t*wy
    lord.MSG land.MDU
    ‘lord of the two lands’

(Pleyte and Rossi 1869: pl.32-33)
In Gardiner (2015a) I argue that, like the Hebrew construct state construction, the Egyptian direct genitive requires head movement of the possessum into D. This is the same process as the head movement proposed above for the non-possessive constructions: \( n \) moves into Num, and the Determiner head has unvalued uN and uDef features that prompt the movement of the \( n \) head into D from its position in Num. Recall that an uninterpretable feature must be valued, either via movement or agreement. Along the same lines as the Gebregziabher (2013) elaboration of Hebrew possession, the unvalued uDef feature in Egyptian D is strong rather than weak, so it must be valued via syntactic movement rather than agreement or post-spell-out movement.

This gives us the structure in (47):

(47)  
\[
\begin{array}{c}
\text{DP} \\
\text{D} \\
\text{Num} \\
\text{n} \text{nb} \text{Num} \emptyset \\
\text{D} \\
\text{NumP} \\
\langle \text{Num} \rangle \\
\langle \text{t} \rangle \\
\langle \text{wy} \rangle \\
\langle \text{n} \rangle \\
\langle \text{nb} \rangle \\
\langle \text{t} \rangle \\
\langle \text{wy} \rangle
\end{array}
\]

Since this construction can be considered the Egyptian equivalent of the Hebrew construct state construction, I will refer to it the same way – the \( s^3 r^* \) possessive.

**More Construct States: The pr.f Possessive**

It seems from their surface word order that clitic direct genitives are similar to \( s^3 r^* \) possessives: possessum precedes possessor here as well. However, there are some differences, given the existence of the \( p^\_f \) possessive. I propose therefore, that in clitic direct genitives all of the same movements apply as for construct state constructions, but the possessor in the specifier of NumP is simply a bundle of phi features, which is spelled-out as a leftward-leaning clitic at spell-out. Consider the following phrase:
Chapter 2. The Syntactic Connection

(48) a. \( \text{pr=k} \)
    \( \text{house.MSG=2MSG} \)
    'your (masc.) house'
    
    (Gardiner and Sethe 1928: pl.6-6a)

Its structure is as follows:

(49)

\[
\begin{array}{c}
\text{DP} \\
\text{D} \\
\text{pr+∅} \\
\text{NumP} \\
\text{clitic} \\
\text{2MSG} \\
\text{(n+Num)} \\
\text{nP} \\
\text{k} \\
\text{(pr+∅)} \\
\text{(n)} \\
\text{(pr)}
\end{array}
\]

This account predicts that we will not see any intervening material between possessum and possessor when it is a clitic, as it is in these \( pr.f \) possessives, and this is borne out in the data.

This analysis also allows for the possessor to be either a full DP with modifying adjectives or a possessed nominal itself, as in (50-a), and predicts that modifying adjectives on the possessum will appear after the possessor, as in (50-d):

(50) a. \( \text{snt mwt=j} \)
    \( \text{sibling.FSG mother.FSG=1SG} \)
    'the sister of my mother'
    
    (Barns 1956: B.28)

b. \( \text{hnt hwt stn} \)
    \( \text{foremost.FSG enclosure.FSG Hemset} \)
    'foremost of the house of Hemset (name)'
    
    (Allen 2005: 18,2)

c. \( \text{qsw mjwt hw\#wt} \)
    \( \text{bone.MPL cat.FPL putrid.FPL} \)
    'the bones of a rotting cat'
    
    (de Buck 1954: V31d)
These structures also predict that \textit{pr.f} possessives will not occur with a pre-nominal determiner: if D were full, it would not need to satisfy its extra features, and therefore would have no need to probe, so no movement from Num to D would occur. No movement means no construct state. But that does not necessarily mean that no possessive can occur, since there is nothing to preclude \textit{pr.f} constructions from occurring with a pre-nominal \textit{demonstrative}, giving us the \textit{pr.f} possessives.

Indeed, we do see \textit{pr.f} constructions occurring with pre- and post-nominal demonstratives:

\begin{align*}
\text{(51) a. } & \text{jb}=j \quad \text{pn} \\
& \text{heart} = 1\text{SG MSG.DEM} \\
& \text{‘this my mind (lit. heart)’} \\
& \text{(Parkinson 1997: 42)}
\end{align*}

\begin{align*}
\text{b. } & \text{pr.f wb}_x = j \\
& \text{MSG.DEM court.MSG = 1SG} \\
& \text{‘this my court’} \\
& \text{(Wente 1990: 179)}
\end{align*}

Given the language stages proposed above, we expect to see pre-nominal demonstratives occurring with \textit{pr.f} possessives only during the periods before the Determiner re-analysis of the \textit{pr.f} demonstratives has occurred. This means that my timeline of Egyptian demonstratives and possessives can be revised as follows:

1. Stage I: only post-nominal demonstratives; Egyptian has no overt Determiner.

2. Stage II: post-nominal demonstratives still exist, but Egyptian develops pre-nominal DemP. Still no overt D. Two DemPs are in competition. \textit{pr.f} possessives can occur with pre-nominal Dem, and \textit{pr.f} in D.

3. Stage III: Pre-nominal DemP replaces post-nominal DemP. DemP Starts to be reanalyzed as D, and these grammars compete. \textit{pr.f} possessives can still occur with pre-nominal Dem, but we should see this less frequently as more speakers should be interpreting \textit{pr.f} articles as Determiners.
4. Stage IV: D analysis of pre-nominal form out-competes Dem analysis, and all pre-nominal forms are analyzed as D. pr.f and s possessives can no longer occur with pre-nominal Dem.

The end of this chapter will see the full version of this timeline described, along with its associated quantitative predictions.

2.2.6 The \( p^1 \) Possessive: A Full Determiner

In Gardiner (2014) I proposed a Possessive Phrase account of both the \( p^1 \) possessive and those direct genitives with clitic possessors; however, this structure did not fully account for the surface differences in word order between the direct genitive and the \( p^1 \) possessive. As described above, the construct state and pr.f constructions place the possessum first, but the \( p^1 \) possessive's order is determiner + (clitic) possessor + possessum.

Instead, I propose a new account for the \( p^1 \) possessive without a dedicated PossP, bringing it more closely into line with the other possessive constructions in the language. I propose that the \( p^1 \) possessive is simply the construction that results when the possessor is a clitic and the D head is filled by a definite article. As is typical for determiners, the article agrees in gender and number with the \( n \). Since D is full already, as when we construct a non-possessive with a pre-nominal definite article, there is no need for D to probe downward to Num, except for agreement. However, now we arrive at the difference between a regular DP with a full D and the \( p^1 \) possessive. Since there is a clitic in the specifier position of Number Phrase, the result is a possessive construction, as it is with pr.f possessives. The clitic must still be attached to the leftmost element – which in this case is the definite article. The result is the \( p^1 \) possessive:

\[
a. \quad n^1 y = s n \quad l h k \cdot w \\
\text{PL.DEM} = 3 \text{PL} \quad \text{sorcerer.MPL} \\
\text{‘their sorcerers’} \\
\text{(Helck 1955)}
\]
This analysis accounts for the sudden emergence of the $p^i$ possessive. It comes into existence shortly after the pre-nominal determiner is introduced to Egyptian. Under this account, the $p^i$ possessive’s structure was always possible, but it could not manifest until an overt pre-nominal determiner came into being. Prior to this change, the noun would always move to D, giving us the construct state or $pr.f$ possessive. In terms of our language stage timeline, we should see these possessives later during the progression of the demonstrative, once it begins to be reanalyzed as a definite article, thus moving it to the Determiner position:

1. Stage I: only post-nominal demonstratives; Egyptian has no overt Determiner.

2. Stage II: post-nominal demonstratives still exist, but Egyptian develops pre-nominal DemP. Still no overt D. Two DemPs are in competition. $pr.f$ possessives can occur with pre-nominal Dem.

3. Stage III: Pre-nominal DemP replaces post-nominal DemP. DemP begins to be reanalyzed as D, and these grammars compete. $p^i$ possessives emerge. $pr.f$ possessives can still occur with pre-nominal Dem, but we should see this less frequently as more speakers should be interpreting $p^i$ articles as Determiners.

4. Stage IV: D analysis of pre-nominal form out-competes Dem analysis, and all pre-nominal forms are analyzed as D. $pr.f$ possessives can no longer occur with pre-nominal Dem. $p^i$ possessives compete with $pr.f$ forms.

### 2.2.7 Adjectival Possession: The nisbe Possessive

Now that we have established structures for the demonstratives and the more contained possessive constructions, we can move on to nisbe possessives. At first glance it appears that these constructions,
possessum + ‘of’ + possessor, are equivalent to the Hebrew or English ‘of’ constructions. The Hebrew structure is shown in (53) (adapted from Ritter (1988)):

(53)

Here, the ‘of’ morpheme, šel, is treated as prepositional adjunct to DP. However, rather than a preposition, I argue that the Egyptian ‘of’ nisbe is a possessive adjective, as per Gardiner (2015a), rather than a preposition. Instead of describing the more traditional traits such as colour or characteristics, this ‘of’ nisbe describes the “belonging-to” status of the possessum.

While this might seem strange at first blush, it is quite well-founded. The nisbe in question follows its noun, which Egyptian adjectives also do (Allen 2010; Hoch 1997; Gardiner 1957). Each Egyptian adjective must also agree in phi features with the noun it follows via a series of agreement suffixes (Allen 2010; Hoch 1997; Gardiner 1957). This is true of the nisbe – it has agreement suffixes that correspond to the noun it follows, the possessum. These suffixes are the same as those seen on all other Egyptian adjectives – shown in (54)– while Egyptian prepositions do not display agreement with their objects.

(54) (Allen 2010)

<table>
<thead>
<tr>
<th>Number</th>
<th>Masculine</th>
<th>Feminine</th>
</tr>
</thead>
<tbody>
<tr>
<td>singular</td>
<td>∅</td>
<td>-t</td>
</tr>
<tr>
<td>plural</td>
<td>-w</td>
<td>-wt</td>
</tr>
</tbody>
</table>

In contrast, prepositions may occur with clitics as their objects – seen in (55)– while the nisbe and other adjectives do not allow clitics to attach.

(55) a. hr=s
upon=3FSG
And finally, this analysis also accounts for the ability of the \textit{nisbe} to occur with very highly-modified nouns, and for its ability to embed possessives within it, as in (56). Therefore, the structure for the sentence in (56) is shown in the example following.

This structure allows for the freedom we see in the adjectival construction in terms of how many modifiers each noun can have, and the stackability of other possessives inside both the possessor and possessum DP spaces. It also accounts for the lack of clitic possessor/possessum, because the \textit{nisbe} adjective, like any Egyptian adjective, requires a DP argument. That is, this structure predicts that the construction will lend itself better to more highly-modified (i.e. more complex) nominal possessives than the construct state construction – recall that in the $s^3 r^s$ possessive, the $n$ head moves into D, disallowing a full D and creating ambiguity regarding any adjectives, which are post-nominal and therefore would appear following both possessor and possessum at spell-out, regardless of the noun they modify. While it would be simple to determine the adjective’s noun if the nouns were of different numbers/genders, it is often the case that both nouns are masculine singular or masculine plural; most Egyptian nouns are masculine (Allen 2010; Hoch 1997; Gardiner 1957).

\begin{itemize}
\item[(56)] a. p$^1$ hr n n$^3$ shrw nfrw
\textsc{msg, dem face-msg nisbe-msg pl, dem plan, mpl good, mpl}
\end{itemize}

‘the face of the good plans’

(Posener 1982: pl.14)
This brings me to my continuous factor: phrase complexity. To reiterate: given the structures for *nisbe* and *s* r* possessives, it appears that the *nisbe* possessive will be more likely to occur with more complex possessive phrases – that is, the more modifying elements there are, the more likely a *nisbe* possessive construction will be. The example tree in (57), for example, has more modifying elements – i.e. a higher complexity – than the simpler, bare-bones possessum + possessor constructions we see in many of the *s* r* examples. I propose then, that complexity be measured numerically in the form of a complexity score based on the possessive construction’s number of additional elements, the details of which will be outlined with the rest of my methodology in the next chapter. I then predict that, as complexity scores move toward the higher end of the continuum, the more likely a *nisbe* possessive will be.

### 2.3 Summary

Given the structures proposed above, I make the following claims about Egyptian possessive structure:
1. Head movement occurs from $n$ to Num, and can also occur from Num to D if D is phonologically empty.

2. The possessive *nisbe* is an adjective.

3. All possessors except those in *nisbe* possessives are in the specifier position of Number Phrase.

4. The pre-nominal $p$ demonstrative is the result of the emergence of a pre-nominal DemP adjunct to DP, which competes for use with an older, post-nominal DemP adjunct.

5. Over time, the pre-nominal demonstrative is reanalyzed as a D head and semantically bleached from demonstrative to determiner.

6. The demonstrative in the $p$ possessive is in D, not Dem.

7. The only difference between the $pr.f$ possessive and the $dp$ possessive is the existence of a full, overt D.

8. $pr.f$ possessives have the same structure as $sr$ possessives, except that the possessor (spec/NumP) is a clitic rather than a full DP.

These claims allow me to make the prediction that the adjectival possessive will favour highly modified (i.e. more complex) possessive phrases than the construct state possessive will, because its structure lends itself less ambiguously to phrases with more modifying adjectives, articles, or possessives within possessives (e.g. ‘the house of his mother’).

Using the structures proposed here, I am now able to propose the full timeline of the stages of change towards $p$ demonstratives/determiners and $p$ possessives. Nominal possession is predicted to be a stable variable and is therefore not included in the timeline, but the prediction is that variants do not change over time, and were both already in use by the time periods observed.

1. Stage I: only post-nominal demonstratives; Egyptian has no overt Determiner or pre-nominal DemP.

2. Stage II: post-nominal demonstratives still exist, but Egyptian develops pre-nominal DemP. Still no overt D. Two DemPs are in competition. $pr.f$ possessives can occur with pre-nominal Dem.

3. Stage III: Pre-nominal DemP begins to replace post-nominal DemP. DemP starts to be reanalyzed as D, and these grammars compete. $p$ possessives emerge.
4. Stage IV: D analysis of pre-nominal form out-competes Dem analysis, and all pre-nominal forms are analyzed as D. \( pr.f \) possessives can no longer occur with pre-nominal Dem. \( pr \) possessives continue to compete with \( pr.f \) forms.

We should see examples of Stage I demonstrative tokens in the Old Kingdom, the earliest part of my timeframe, as in (58-a) from Dynasty 6. At this point in the change, the only \( s + r \) examples and \( pr.f \) examples with demonstratives should occur with either no demonstrative, or with post-nominal demonstratives only, as in (58-b) and (58-c), respectively.\(^1\) Likewise, \textit{nisbe} possessives would be found either with no demonstrative, or with a post-nominal demonstrative. The example in (58-d) demonstrates a \textit{nisbe} possessive with a bare possessor and a demonstrative-modified possessum.\(^2\) The \( p \) possessive does not yet exist at this stage (Allen 2013; Kupreyev 2013; Allen 2010; Egedi 2010; Loprieno 1995; Hoch 1997; Gardiner 1957; Edel 1955).

\[(58)\]
a. \texttt{zh(w)} \texttt{pn nfr nfr}  
letter.MSG MSG.DEM beautiful beautiful  
‘this very beautiful (lit. beautiful beautiful) letter’  
(Wente 1990: 149-152)
b. \texttt{k_3 s\text{bj}}  
bull.MSG speckled-snake.MSG  
‘the male (lit. bull) of the speckled snake’  
(de Buck 1954: V40c)
c. \texttt{d\text{rjt}=j} \texttt{tn}  
hand.FSG=1SG FSG.DEM  
‘this hand of mine’  
(de Buck 1954: VII95a)
d. \texttt{wdw pn n n(j)s\text{w}}  
command.MSG MSG.DEM NISBE.MSG king.MSG  
‘this command of the king’  
(Gardiner 1916: 181)

Stage II is when we see the first instances of the pre-nominal \( p \) demonstrative as a DemP adjunct. An example of this in a demonstrative construction is illustrated in (59-a). During this stage, we begin to see \( s + r \) and \textit{nisbe} possessives with \( p \) demonstratives – shown in (59-b-c) and (59-d-e), respectively. During

\(^1\)These latter two examples are attested in the famous Coffin Texts (de Buck 1954), magical texts from the early Middle Kingdom. The tokens were taken from Middle Kingdom texts rather than old Kingdom texts because possessive tokens were obtained no earlier than the Middle Kingdom: the \( p \) possessive is not attested until the Middle Kingdom, putting Old Kingdom possessive data outside the scope of possessive variation. However, these two tokens do exemplify the kinds of possessive examples we find in the Old Kingdom as well, before the emergence of \( p \) in demonstratives or possessives (Allen 2010; Loprieno 1995; Hoch 1997; Gardiner 1957).

\(^2\)This example, like the \( s + r \) and \( pr.f \) examples, comes from Dynasty 12, this time from a literary papyrus (Gardiner 1916).
this stage, s Possessives can appear with p Demonstratives before either the possessor ((59-b)) or possessum ((59-c)). Likewise for nisbe possessives, shown in (59-d) and (59-e), respectively.\footnote{We should also find pr.f Possessives with p Demonstratives at this stage, but these are not attested in my data. This is likely due to the rarity of pr.f + DemP constructions in general: my datatest has an exceedingly small number of pr.f tokens occurring with pn Demonstratives as well (N = 3).} This stage is predicted to begin during the latter part of Old Kingdom, with the earliest attestations of p Demonstratives sometime around Dynasty 6, as per Egyptological claims (Kupreyev 2013; Edel 1955).

(59) a. p\textsuperscript{3} ṣ
msg\textsuperscript{2} dem lake[msg]
‘this lake’

(James 1962: vso 10-11)

b. awj p\textsuperscript{3} ntr
arm\textsuperscript{3} MDU msg\textsuperscript{2} god[msg]
‘the two arms of the god’

(Wente 1990: 179)

c. p\textsuperscript{3} hm nswt
msg\textsuperscript{2} dem servant[msg] king[msg]
‘the servant of the king’

(Collier and Quirke 2002: 74-75)

d. [p\textsuperscript{3}] smj n(j) t\textsuperscript{3} šat
[MSG.DEM] acknowledgment[msg] NISBE.FSG FSG.DEM document.FSG
‘[this] acknowledgment of this document’

(Collier and Quirke 2002: 54-57)

e. tA b\textsuperscript{3}kt n(j)t pr
FSG.DEM servant.FSG NISBE.FSG house[msg]
‘this servant of the house’

(James 1962: rcto 1-4)

Stage III is predicted to begin during the Middle Kingdom, c. Dynasty 12, with the reanalysis of p Demonstratives as Determiner heads. This stage continues through Dynasty 19, and is marked by the emergence and rise of the p Possessives: once Determiner heads exist, p Possessives exist too, as these are the manifestation of a clitic possessive with a full, overt D. A typical p Possessive is shown in (60-a) (and all instances of the p Possessive are instances of p as D rather than Dem, as per the the syntactic structures proposed above). During this stage, the competition between DemP and D versions of p continues, and p becomes more widespread in both possessives and demonstratives. Ambiguity will exist during this time: we cannot know with 100% certainty that all instances demonstrative p are D
rather than Dem until \( s^r r^p \) possessives occurring with \( p^r \) preceding the possessum (as in (59-c)) are no longer attested. \( s^r r^p \) possessives are always possible with a \( p^r \) demonstrative preceding the possessor, as the possessor is a DP. Indeed, the example of this in (59-b) comes to us from Dynasty 19, during Stage III.

(60) a. \[ p^r y = k \text{ pr} \]
\[ \text{MSG.DEM} = 2 \text{MSG house.MSG} \]
\[ \text{‘your (masc.) house’} \]
(Wente 1990: 26-27)

Given Egyptological claims that the end of Dynasty 18/beginning of Dynasty 19 (1292 BC) is when the \( p^r \) possessive begins its steep rise to popularity (Kupreyev 2013), I predict that Stage III will continue from Dynasty 12 through Dynasty 19.

This brings us to Stage IV: at this stage, late in the change, DemP has fully disappeared. There are no more attestations of \( s^r r^p \) possessives with \( p^r \) demonstratives preceding the possessum unless the possessives themselves have become frozen lexical items – titles such as \( hwt-nt^p \) (lit. ‘house of the god’, meaning ‘temple’). At this stage, \( p^r \) possessives will be abundant, as all instances of \( p^r \) are Determiner heads rather than Demonstrative heads. Given the slowness of the change, this stage is not predicted to occur until after Dynasty 19, once the steep part of the s-curve has been reached for \( p^r \) possessives – if \( p^r \) possessives are on the dramatic rise, it means that the demonstrative \( p^r \) as D has all but out-competed its Dem counterpart. This places Stage IV in Dynasty 20 (1077 BC), near the end of the investigated time period.

It is evident from this account of the various languages stages that demonstratives and clitic possessives, and the variation within them, has quite an impact on the Egyptian language structure – they are part of a change in the grammar. In contrast, it is clear that the variation between nominal possessives, their two variants, has a minimal impact on the grammar. This is related to Labov’s (2001: 10) claim that stable variation will have a lesser impact on the grammar of a language than a change variable will – another reason to predict that nominal possession will be stable over time.

To conclude, this syntactic account has served two purposes. First, I use the structures proposed to derive my continuous factor, phrase complexity, and to then predict that \( nisbe \) possessives will be favoured in more highly complex constructions. Second, I used the structures of the other three possessive constructions and the demonstratives to make a predictive timeline of when certain constructions will appear and/or disappear. That is, I make clear predictions based on this structural analysis that are tested statistically in the coming chapters. However, before we move on to the statistical analysis, we
must address the remaining aspects of background needed to compare nominal and clitic possessives. In that vein, the next chapter will detail the methods used to obtain and code my data, including my discussion of alienability and its relationship to the possessives’ variability.
Chapter 3

Methods

In order to understand the results of my statistical analyses, it is necessary first to understand the tokens (examples of Egyptian possessives and demonstratives) that I use for those analyses – where I obtained them, how I labelled them, what factor groups (independent variables) I included in the statistical analysis, and why. This section will detail those methods, and in so doing it will provide the second piece of background necessary for understanding the statistical analyses of the Egyptian variables: the alienability and animacy study. This chapter will first detail my data sources and my organizational procedure for the inclusion of each token, moving on then to what factor groups I included and my reasons for doing so, including my discussion of alienability/animacy in Egyptian, and how I showed that these variables are truly variable. I then conclude the chapter with a discussion of the statistical analyses I use to compare clitic and nominal possession, and why.

3.1 Data Sources

In order to test my hypotheses, I extracted tokens from the free online corpora within the *Thesaurus Linguae Aegyptiae* (TLA) (TLA 2016). Following the methodology of Gardiner (2017) and improving upon the methodology of Gardiner (in press, 2015b, 2014), I used the Digital Heka corpus of magical texts, and the Berlin-Brandenberg corpus of letters and literary texts from the Middle and New Kingdoms to obtain tokens for all possessive and demonstrative types. This was done by reading the texts in this corpus and extracting every instance of a possessive as a token for input into an Excel spreadsheet. An instance of a possessive token was any block of text, as defined by the TLA, that contained a possessive. If this block of text contained two possessives, it was counted twice, and each time coded for the relevant information. While somewhat archaic, this was the most rapid method for obtaining possessive tokens.
using this or any Egyptian corpus to date, and was ideal for obtaining possessives in the order in which they occur and providing an accurate measure of the frequency of each possessive type in each text.

### 3.2 Token Extraction

The variants of nominal possession are as follows:

1. $\textit{s} \textit{r}$ possessive (possessum noun followed by possessor noun)

2. $\textit{nisbe}$ possessive (possessum noun followed by possessive $\textit{nisbe}$, followed by the possessor noun)

An example of the $\textit{s} \textit{r}$ possessive is shown in (1-a) and an example of the $\textit{nisbe}$ possessive is shown in (1-b):

(1) a. pr nswt
   house.MSG king.MSG
   ‘the king’s house’ (i.e. ‘the palace’)
   (Parkinson and Baylis 2012: 244,11-13)

   b. hz(w)t n(j)t mntw
   favour.FSG NISBE.FSG Montu
   ‘the favour of Montu’
   (James 1962: DocII)

The variants of clitic possession are as follows:

1. $\textit{pr}.f$ possessive (old form – possessor features attached to possessum)

2. $\textit{p}$ possessive (innovative form – possessor features attached to the prenominal demonstrative)

An example of the $\textit{pr}.f$ possessive is shown in (2-a) and an example of the $\textit{p}$ possessive is shown in (2-b):

(2) a. pr=k
   house.MSG=2MSG
   ‘your house’
   (Gardiner and Sethe 1928: pl.6-6a)
b. \( p_y = k \) pr
\[ \text{MSG.DEM} \rightarrow 2 \text{MSG house.MSG} \]
your house’

(James 1962: Doc.XVII)

The variants of the demonstratives are as follows:

1. \( p_n \) possessive (old form — post-nominal demonstrative)

2. \( p_t \) possessive (innovative form — pre-nominal demonstrative)

Examples of each demonstrative type are shown in (3).

(3) a. \( hrd \) pn
\[ \text{child } \text{MSG.DEM} \]
‘this child’

(Bardinet 1995: B33)

b. \( p_t \) mw
\[ \text{MSG.DEM water.MSG} \]
‘this water’

(Blackman 1988: 6,11)

Information included in the Excel sheet for each possessive was the block of text in transliterated Egyptian (i.e. in a modified Roman script rather than hieroglyphic or hieratic), the German translation of that block of text (provided by the TLA), the English translation of the possessive DP itself (eg. ‘his mother’), and the code for each sociolinguistic factor (to be discussed below). Each block of text was read through three times in the Egyptian in order to be certain that no possessive token was missed. Additionally, the German translation was read as well, to double-check for any missed possessives, and was input into a translation program for added surety. These read-throughs were not used alone, but exist merely for the purposes of illuminating any missed possessive constructions. A German or English translation is not always equivalent to a possessive in Egyptian, so if no possessive exists in the original Egyptian but does exist in German or English, it was not included. If a construction is possessive in

---

1 Recall that there are technically two series of demonstratives that I have combined into one variant here — the \( pf \) series and the \( pn \) series, discussed previously in the syntactic analysis. I have combined them for two reasons: first, the proposed structure is the same for both of these demonstrative series; second, I was only able to obtain a minimal sample of the \( pf \) series, \( N < 5 \).
Chapter 3. Methods

Egyptian but not in translation (either into German or English), it was of course included in the data set.

The same procedure was followed for the Berlin-Brandenburg corpus of letters, literary texts, and historical texts. This gave me approximately 4700 tokens in total. These corpora span the same time periods as the Digital Heka corpus (from the Old Kingdom through the end of the New Kingdom), and like the Digital Heka corpus, come from all over Egypt.

To constitute a valid token, each nominal possessive must have two full nouns, and each clitic possessive must have a clitic and a noun. In the cases of the pr possessive, the demonstrative (the pr, or its feminine or plural equivalent) must also be fully present, and in the nisbe possessive the nisbe must be present. If the possessum could also be interpreted as a verb, it was excluded on the off-chance that it is a verbal construction instead; verbal constructions are written with the same order as pr.f and sn posessives (verb + subject, either nominal or clitic).

3.2.1 Other Exclusions

Here the issue of reconstructions must be addressed as well: many texts are missing portions of or entire words, where the most likely word or portion of the word is reconstructed by the translating scholar and written using square brackets []. While these reconstructions are no doubt accurate, for the sake of obtaining the most accurate representation possible, if more than half of either noun or demonstrative is missing, or if a clitic possessor is left out but is inserted via reconstruction, the possessive was excluded from the token set.

Likewise, occasionally we will see “scribal errors” where a letter in a familiar word is written more than once, or a wrong letter is inserted – presumably all by accident. Any possessive instances where this “accidental” letter is an extra clitic following the possessor clitic or any extra letter on the possessive nisbe adjective was also excluded from the token set.

Finally, I have also endeavoured to exclude the most glaringly formulaic phrases, whose meanings have been fossilized such that they are no longer possessive. These include religious/official and royal constructions such as hwt-nty (‘temple,’ lit. ‘enclosure of the god’), pr hd (‘treasury,’ it. ‘house of silver’), pr dd (lit. ‘house of eternity’), htp nsw-bity (‘Dual King’, lit. ‘king of Upper and Lower Egypt’), and nb tswy (lit. ‘lord of the two lands’). These phrases and others like them are used so frequently in the sn form by the time period of my investigation that I am not able to guarantee that they are not frozen lexical items rather than productive possessives. However, the use of a more “archaic” language style is still considered valid for this study, so if the possessors and possessa were simply old-fashioned but
could occur with many different possessa or possessors, they were still included. For example, body part tokens often appear with the $s$ $r$ or $pr.f$, but since they do not categorically fall under the umbrella of these two variants – that is, they sometimes occur with a $nisbe$ or $p$ possessive – they were included still. Similarly, titles such as $nb$ (‘lord’) are sometimes archaic constructions, but if the construction occurred with both variants, it was of course included in the token set. For example, $nb$ is shown with both a $p$ possessive and $pr.f$ possessive in (4-a) and (4-b), respectively.

(4) a. $p$ $y=j$ $nb$
   
   MSG.DEM=1SG lord.MSG
   ‘my lord’ (Collier and Quirke 2002: 84-85)

b. $nb=f$
   
   lord.MSG=3MSG
   ‘his lord’
   
   (Janssen 1960: 44)

Since these kinds of titles, epithets, and body part tokens occur with varying possessors, they cannot be considered frozen lexical items. The most notable case of boundary-push ing in the dataset for these kinds of titles were tokens with $n(j)sw$ (sometimes $n(j)swt$, ‘king’) as the possessor: this set of 60 words occurs only once with the $nisbe$ possessive – with the possessum ‘command,” shown in (5-a). This possessum also occurs in the dataset, with the ‘king’ possessor, as a $s$ $r$ construction, shown in (5-b).

(5) a. $wdw$ $pn$ $n$ $n(j)swt$
   
   command.MSG MSG.DEM NISBE.MSG king.MSG
   ‘this command of the king’
   
   (Gardiner 1916: 181)

b. $wd(w)$ $nswt$
   
   command-MSG king-MSG
   ‘command of the king’
   
   (Pleyte and Rossi 1869)

However, despite its near-categoricity, I have included tokens occurring with the ‘king’ possessor as part of the evidence for possessor type playing a significant role in possessive variant selection. The dataset is so small that there would be no benefit to removing such a large number of tokens that can possibly give insight into what types of possessors favour which variant.
Chapter 3. Methods
80

To obtain tokens for the demonstrative/definite article, this methodology remains the same: any instance of a token is an occurrence of the pre-nominal or post-nominal article. This allowed me to measure the spread and increase of the use of the pre-nominal article as compared to the use of the post-nominal article. It has also been noted that the pre-nominal demonstrative article became a definite article at some point during the New Kingdom, which means that it could be in variation with bare nouns as well as with post-nominal demonstratives. However, since it is not reliably possible to infer the definiteness of these bare nouns from context, I could not include a comparison of the pre-nominal demonstrative to bare nouns – only a comparison to post-nominal articles, and a documentation of the pre-nominal article’s usage and diffusion to different regions over time.

Choice of time period from which to obtain tokens, and which time periods to exclude, was based on Egyptological literature describing the first attestations of the $p^1$ demonstrative and the subsequent emergence of the $p^1$ possessive – since, without these variants, there would be no variation to analyze in either clitic possessives or demonstratives. Egyptological literature places the first attestations of the $p^1$ demonstrative as early as Dynasty 6, during the Old Kingdom period (c. 2345 BC) (Kupreyev 2013; Edel 1955). Therefore, in the original search demonstrative data from this period and slightly earlier was included, dating back to Dynasty 3 (c. 2686 BC), in order include possible earlier instances of $p^1$. However, my dataset did not contain any $p^1$ prior to Dynasty 6, so all tokens from before this dynasty were excluded. This was done so as to include only the period during which variation truly exists. Due to a dearth of demonstrative tokens, time period could only be assessed by Kingdom (Old Kingdom, Middle Kingdom, New Kingdom), rather than by dynasty.

The same procedure was followed to obtain possessive tokens, except that in this case time period could be measured by dynasty. Egyptological literature notes the first attestations of $p^1$ possessives in the early Middle Kingdom, during the latter part of the 11th Dynasty (c. 2060) (Kupreyev 2013; Hoch 1997; Gardiner 1957). Therefore, my search included this period as well as slightly earlier: the early 11th Dynasty (in the first Intermediate Period), and Dynasty 10 (also during the First Intermediate Period). No $p^1$ possessive tokens could be found in my dataset before late Dynasty 11, however, so tokens from earlier time periods were excluded. Tokens were obtained from this point up until the beginning of the Third Intermediate Period (c. 1069-945 BC). The periods after this were excluded for two reasons: first, this period marks a turbulent end to Egypt’s golden age and the Bronze Age itself for all Mediterranean civilizations (Stiebing 2009: 238); second, this period also leads into the Late Period, during which another writing system is developed – Demotic (Allen 2010; Loprieno 1995; Hoch 1997; Gardiner 1957), which could be a potential confound in terms of factors constraining variation.

It should be noted here that these distributions already provide support for some of my syntactic
predictions: \( p \) demonstratives begin to be found in Dynasty 6, as predicted, and \( p \) possessives begin to emerge in Dynasty 12, from the Middle Kingdom.

### 3.2.2 Summary

Before discussing the statistical analysis I conduct in order to obtain my results, which is found at the end of this chapter, I first motivate and discuss my coding scheme, including what factor groups (independent variables) I include in my analyses and why. In that vein, the section that follows provides a brief background on the constraining factors in possessive variation cross-linguistically, as this literature will be the basis for my choices of factor groups. Following this overview, I provide my motivation for my choice of factor groups and the coding thereof, and I use this information to show that there is real variation in each possessive variable, contra previous suggestions of a categorical alienability split (Egedi 2010; Kammerzell 2000).

### 3.3 Possessum and Possessor Effects in Genitive Variation: A Cross Linguistic Background

A great deal of research has been conducted on possessive variation in Indo-European languages, especially English genitive variation (Jankowski and Tagliamonte 2014; Szmrecsanyi 2009; Hinrichs and Szmrecsanyi 2007; Rosenbach 2007, 2003, 2002; Raab-Fischer 1995; Fischer 1992; Mustanoja 1960; Thomas 1931). In English, the distinction is generally made between the \textit{of}-genitive and the \textit{s}-genitive. Examples are illustrated in (6-a) and (6-b), respectively.\(^2\)

\[(6) \quad \begin{align*}
&\text{a. } \text{‘the house of the king’} \\
&\text{b. } \text{‘the king’s house’}
\end{align*}\]

The main difference is the existence of the genitive morpheme \( s \) on the possessum, as in (6-b), as compared to the lack of genitive morpheme and therefore the required preposition \textit{of} following the possessum, which is then followed by the possessor. These are roughly comparable to the Egyptian \( s^r \) possessive and \textit{nisbe} possessives, respectively: the \textit{nisbe}, despite being an adjective, is the Egyptian equivalent of the English \textit{of}, while the \( s^r \) requires no additional phrase (i.e. no adjective or preposition).

\(^2\)These examples are of my own making, as a native speaker of English.
Abel (2006) also describes a variant known as the double genitive, which makes use of the genitive suffix *s* as well as the preposition *of* – shown in (7).

(7) a. ‘that book of John’s’

(8) a. 'his house'

b. ‘this house of his’

While these pronominal genitives do not equate exactly with the Egyptian clitics, the constructions in (8-a) and (8-b) are roughly analogous to the Egyptian *pr.f* and *p* constructions, respectively – although the *p* possessive does not require the Egyptian equivalent of *of*, which would be the *nisbe*, so it is evident that the similarities only extend so far. We will see that this is true for much of the analysis of English and other Indo-European languages – while there is a good foundation for Egyptian research to build on, and some analogy is possible, Egyptian is not an Indo-European language, so the relevance for Egyptian of the methods used to study Indo-European languages’ possessive constructions will only extend so far.

Historically, the *of*-genitive is the innovative variant (Wolk et al. 2013; Thomas 1931), a Latinate construction that emerged in Middle English (Jankowski and Tagliamonte 2014; Rosenbach 2002; Fischer 1992; Mustanoja 1960; Thomas 1931). The *of*-genitive began to overtake the *s*-genitive during this time (Jankowski and Tagliamonte 2014; Ehret et al. 2014), but use of the *s*-genitive has been increasing steadily since the 16th century AD – a trend that continues even into the present day (Szmrecsanyi 2009; Hinrichs and Szmrecsanyi 2007; Rosenbach 2007, 2003; Raab-Fischer 1995; Dahl 1971; Potter 1969), most notably in press registers (Jankowski and Tagliamonte 2014; Hinrichs and Szmrecsanyi 2007; Rosenbach 2002).

In the present day, the *s*-genitive has been associated with animate possessors, while the *of*-genitive is associated with inanimate possessors (Jankowski and Tagliamonte 2014; Rosenbach 2008, 2005; Biber et al. 1999; Ljung 1997). Additionally, an animacy hierarchy has been proposed, where human possessors favour the *s*-genitive the most strongly, followed by other animates, and then inanimates, at which point the *of*-genitive becomes more likely – the trick is, though, that non-human “animate” category can

---

3These examples are of my own making, as a native speaker of English.
include such possessors as organizations, intelligent machines, and vehicles (adapted from (Zaenen et al. 2004: 11) and (Jankowski and Tagliamonte 2014: 308)). That is, the domain of the s-genitive is expanding – supported by findings from Jankowski and Tagliamonte (2014) among others, who found evidence for a change over time in s-genitives wherein they are spreading into the category of possessors which are collective and/or organizations. This change has already proceeded almost to completion in favour of the s-genitive in human possessors (Jankowski and Tagliamonte 2014; Szmrecsanyi and Hinrichs 2008) – the only exceptions being when the phonological constraints strongly disfavour the s-genitive. These phonological constraints are possessors with final sibilants; these possessors, for example research, strongly favour the of genitive (Jankowski and Tagliamonte 2014: 320).

There are also morphosyntactic factors at work: end weight has been seen to have an effect on genitive variation: when a possessor is fewer words than the possessum, the s-genitive is favoured, while possessum with fewer words than the possessor favours the of-genitive (Jankowski and Tagliamonte 2014; Szmrecsanyi and Hinrichs 2008; Hinrichs and Szmrecsanyi 2007).

Finally, written register differences have been noted as well: Jankowski (2013), for example, finds that the s-genitive for non-human possessors is on the rise in the written registers of Maclean’s magazines and parliamentary transcripts (Jankowski 2013: 102), and others have found the s-genitive to be more frequent in written journalism (Jankowski 2013; Leech et al. 2009; Szmrecsanyi and Hinrichs 2008; Hinrichs and Szmrecsanyi 2007; Biber et al. 1999; Jucker 1993). Similarly, journalistic prose is found to be influenced by the principle of economy, where the s-genitive is favoured simply because it is shorter and preserves space in the writing (Jankowski and Tagliamonte 2014; Jankowski 2013; Szmrecsanyi and Hinrichs 2008; Hinrichs and Szmrecsanyi 2007).

More closely related to Egyptian, Arabic possession also has several variants. For example, an alienable/inalienable split is seen in Moroccan Arabic, where inalienable nouns typically prefer the Arabic synthetic possessive – the construct state construction, equivalent to the Egyptian s\textsuperscript{s} r\textsuperscript{c} and pr.f possessives (Boumans 2006). Conversely, inalienable nouns favour the analytic forms, equivalent to the Egyptian nisbe and p\textsuperscript{r} possessives. (Boumans 2006: 219) describes inalienable nouns, based on the classifications of Nichols (1988), with the following inalienability hierarchy:

1. kin terms and/or body parts
2. part-whole and/or spatial relations
3. culturally basic possessed items (e.g. house, name, items of clothing)

The more higher up on the inalienability hierarchy the possessum is, the more likely a synthetic form
will be chosen (Boumans 2006; Nichols 1988). Human possessors, followed by other animate possessors, reportedly favour the synthetic form as well (Boumans 2006; Nichols 1988).

Boumans (2006) also notes that the synthetic construction appear in Moroccan Arabic fixed expressions, for example:

(9) a. ṭīr l-līl
   birds night
   ‘bats (lit. birds of the night)’
   (Boumans 2006: 219)

This is similar to Egyptian frozen lexical items that arose from possessive constructions – the exclusions discussed in the section above, such as:

(10) a. ḥwt nṯr
   enclosure.FSG god.MSG
   ‘temple (lit. enclosure of the god)’
   (Gardiner 1957: 65)

Other linguistic factors constrain Moroccan Arabic possessives as well, such as phonological shape: nouns ending in the vowel /u/ or /i/ favour the analytic construction (Boumans 2006: 219). In terms of syntactic constraints, it has been found that having two or more coordinated possessors and/or an article present are conditions which favour the use of the analytic form (Boumans 2006; Youssi 1992; Eksell Harning 1980).

Whether the word is a borrowed is also relevant: “[w]hen Standard Arabic or French words for kinship terms or body parts are used as possessed forms [in Moroccan Arabic], they occur in the analytic construction, in contrast with the MA equivalents” (Boumans 2006: 220) – though loan words ending in -a are treated as native words (Boumans 2006: 220). Relatedly, Boumans (2006) and others (Iraqui-Sinaceur 1998; Eksell Harning 1980) also note regional differences: for example, the Tangier dialect favours the analytic form, as do other northern dialects more generally (Boumans 2006; Heath 2002). Boumans (2006) also describes a potential influence of language contact with Berber and French: child speakers of Moroccan Arabic raised in the Netherlands have a stronger preference for the analytic form than speakers of the same age in Morocco itself.

Building on the basis of the extensive work on English possessive variation, as well as on the study of Arabic possessive variation, there are several factors to consider for Egyptian: alienabity, register/style, animacy, region, change over time, and length of phrase. In the remainder of this chapter, I will detail the ways in which I operationalize each of these factor groups for Egyptian possessive variation in a
manner that allows me to compare the trends in the stable variable to those in the change variable. The next section, specifically, focuses on the most complex of these factor groups: word type – namely, how I reconcile the alienability factor with the animacy factor to arrive at appropriate word category factor groups for both possessor and possessum.

3.4 Understanding Noun Categories in Egyptian: The Dhut-mose Letters

Recall that Egyptological literature has made claims that both nominal and clitic possession is split according to alienability: alienable possessa are said to occur with *nisbe* and *p* possessives, while inalienable possessa are said to occur with *sr r* and *pr.f* possessives (Kammerzell 2000; Egedi 2010). It is therefore necessary for me to discuss alienability in order to demonstrate that these variables are, in fact, variable.

However, several problems arise when it comes to alienability. The concept of alienability is directly tied to possession: something inalienably possessed is something that cannot be separated from its possessor – for example, one’s hand cannot be bought and sold; in contrast, one’s house can be (Nichols and Bickel 2011). However, the concept is also directly tied to which type of possessive construction is used. That is, a possessed noun is generally referred to as inalienable if it occurs with the possessive variant slated for inalienable nouns (Nichols 1988). Since this analysis is aimed at actually testing this – whether a given noun is more likely to occur with one variant over the other – we cannot use this definition.

Another issue is that we do not have a clear definition of what constitute an alienable or inalienable noun in Egyptian – Kammerzell (2000) does scribe inalienable nouns as “above all body parts, kinship terms and entities indispensably connected with a particular individual such as name, household, property” (Kammerzell 2000: 100) but “entities indispensably connected with a particular individual” has the potential to be tremendously subjective, especially given that native Egyptian speakers cannot be consulted on the matter.

Finally, we also know that alienability, and which nouns are considered alienable vs. inalienable, may differ across languages (Nichols and Bickel 2011; Haspelmath 2008; Nichols 1988), so we cannot make use of another language’s schema. And, unlike Arabic (Hoyt 2008; Boumans 2006), there are no suffixes present in Egyptian whose presence might inform us that a noun is inalienably possessed. It is possible to create a basic category for Egyptian of what kinds of nouns might be inalienable, given that
Nichols and Bickel (2011) provides a list of nouns which almost always correlate cross-linguistically with inalienability: names, body parts, and kinship relations. This jibes with Kammerzell’s (2000) definition above.

However, we must also consider the animacy of the nouns, as well as the characteristics of the possessor, since this was an important factor in constraining Arabic possession (Boumans 2006). Furthermore, allowances must be made for Egyptian as a language that is neither English nor Arabic, so there must be some freedom that allows us to see how the data themselves pattern, rather than attempting to force the data into categories created for other languages. Therefore, I devise a new system for separating nouns into types, for both possessor and possessum. In that vein, I turn to the letters of the scribe Dhutmose.

### 3.4.1 The Dhutmose Letters

Using the letters of one scribe, Dhutmose, I am able to eliminate potential confounds such as regional differences, differences across speakers, register differences, and time period differences. This allows me observe which word types pattern together in their variant choice without the interfering effects of these social factors. I use these observations to create factor groups for possessum and possessor type, addressing how to describe “alienability” for Egyptian, as well as how to include animacy. It is important to note that these categories are simply a first step in beginning to categorize and understand Egyptian possession from a variationist perspective; they are a tool for studying the effects of noun type in possessor and possessum that leaves space to build on previous work on English genitives, while also accounting for factors involved in Arabic and any other related differences between Egyptian possession and English possession. I will begin by introducing Dhutmose and describing the differences in distributions of his use of all four possessive constructions, ruling out lifespan change and honing in on the way possessum and possessor type affect variant choice. This is followed by a generalization of these findings to the larger dataset, and thus the creation of my factor groups for possessum and possessor type for each possessive variable.

Dhutmose’s official title was Scribe of the Necropolis – scribe of the village of the royal tomb-builders. There were usually two incumbents that held this role at any given time; for the earliest Dhutmose letters, he shared his scribal role with a man named Efnamon (Wente 1967). Fellow scribe Efnamon was replaced upon his death by his son, Esamenope, who was himself succeeded by Dhutmose’s own son, Butehamon. Dhutmose continued his role as Scribe of the Necropolis throughout these changes, and his earliest letters date from year 12 of Ramesses XI’s reign – 1095 BC (Wente 1990, 1967) – and Ramesses XI himself was the last Pharaoh of the 20th Dynasty, whose reign ended the New Kingdom and led to the Third
Intermediate Period. This therefore places Dhutmose at the end of the investigated time period for my large-scale possessive study. The time of Dhutmose was a period that led to the final collapse of the Egyptian empire – a turbulent time politically. This is especially true for the time shortly before year 19 of Ramesses XI’s reign: a military coup from Nubia was suppressed at this time, and the year 19 of Ramesses XI and onward begin again as year 1 of *wḥm mswt* (‘renaissance’) (Wente 1967).

<table>
<thead>
<tr>
<th>Year</th>
<th>$p^1$</th>
<th>$pr.f$</th>
<th>$s\ r^1$</th>
<th>$nisbe$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 Ramesses XI (1095 BC)</td>
<td>11</td>
<td>7</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>61%</td>
<td>39%</td>
<td>19%</td>
<td>81%</td>
</tr>
<tr>
<td>Year 2/3 <em>wḥm-mswt</em> (1085/1086 BC)</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>43%</td>
<td>57%</td>
<td>42%</td>
<td>58%</td>
</tr>
<tr>
<td>Year 6 <em>wḥm-mswt</em> (1083 BC)</td>
<td>28</td>
<td>6</td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>82%</td>
<td>18%</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>Year 10 <em>wḥm-mswt</em> (1077 BC)</td>
<td>36</td>
<td>25</td>
<td>42</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>59%</td>
<td>41%</td>
<td>52%</td>
<td>48%</td>
</tr>
<tr>
<td>Year Unknown</td>
<td>3</td>
<td>5</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>38%</td>
<td>62%</td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>47</td>
<td>97</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>63%</td>
<td>37%</td>
<td>49%</td>
<td>51%</td>
</tr>
</tbody>
</table>

Table 3.1: Dhutmose’s use of each possessive variant over time.

I was able to obtain a total of 338 possessive tokens in the letters written by Dhutmose, over the span of almost 20 years. His rate of each of the four possessive variants, divided by year, is shown in Table 3.1. Most obvious at first glance is the fact that Dhutmose has more $p^1$ possessives than $pr.f$ possessives – but this is in line with predictions about $p^1$ possessives replacing $pr.f$ possessives over time. Indeed, it is also in line with the overall results that follow this chapter, where the rate of $p^1$ possessives increases in later dynasties such as Dynasty 20, during which time Dhutmose lived.

What is surprising for the clitic possessive results is the striking contrast between Year 6 of the *wḥm mswt* period as compared to the other four time points: at this point, there are many more $p^1$ tokens than $pr.f$ tokens. Indeed, compared to the other two *wḥm mswt* periods as well as the unknown year, the difference is statistically significant in a Fisher’s exact test ($p < 0.05$). The only time point for which the comparison to Year 6 *wḥm mswt* is not statistically significant is Year 12 Ramesses XI. I will return to this $p^1$ puzzle momentarily.

The second noteworthy piece of information we can observe in Table 3.1 is that for nearly every
year, including the letter for which the year is unknown, Dhutmose appears to have a relatively even split between *s* *r* possessives and *nisbe* possessives. The only exception to this is the very first year for which we have Dhutmose’s letters: year 12 of the reign of Ramesses XI, 1095 BC. In this year, Dhutmose uses the *s* *r* possessive only 5 times, but uses the *nisbe* possessive 21 times – a very striking difference compared to the other years in which he writes letters.

Fisher’s exact tests show that the difference in the rates of *s* *r* and *nisbe* possessives in year 12 are significantly different from the combined rates in years 2/3, 6, and 10 of the *wḥm mswt*. Similarly, when year 12’s *s* *r* and *nisbe* possessives are compared individually with those of *wḥm mswt* year 6 or year 10, the difference is statistically significant (Fisher’s exact test, p < 0.05). Only the comparison of year 12 with *wḥm mswt* year 2/3 is not statistically significant.

There are several possible explanations for the change in the *nisbe* to *s* *r* ratio. The first and most obvious explanation is that Dhutmose’s use of nominal possessives is subject to age-grading, or lifespan change – a phenomenon that exists in stable variables (Wagner 2012) – and I do predict that nominal possessive variation is stable. In age-graded sociolinguistic variables, we see a shift in speakers’ use of each variant over their lifetime: they prefer one variant as teenagers, and as they move into adulthood they come to favour the other variant instead. We know that Dhutmose must be relatively young in this first series of letters, since he holds his position as Scribe of the Necropolis for decades afterward (as evidenced by the other letters), so we could be witnessing his final shift from youth to adulthood. This could account for the difference between year 12 and *wḥm mswt* year 2/3 being the only non-significant one: this is exactly the result we would expect to see if the lifespan change begins sometime between year 12 and year 2/3, but doesn’t reach completion until year 6.

However, variables that are subject to age-grading are usually subject to social judgments as well, with youths preferring the stigmatized form, and adults – presumably trying to climb the social ladder – preferring the standard variant (Wagner 2012). This characteristic of age-graded variables does not hold for the Egyptian nominal possessive: there is no evidence that either variant is particularly stigmatized or prestigious. Because of this, and the fact that we have only one letter from Year 12, we must also consider other possible explanations for the change. These include the recipient of the letters, and what words make up the possessa in each of the letters. This will also allow us to discover the cause of the *p* puzzle – the *wḥm mswt* Year 6 blip in the clitic variable.

Recipient is an important factor to consider because Dhutmose’s relationship to and attitude towards whomever he is writing to will naturally affect the kind of language he uses, which may in turn affect his choice of nominal possessive. For example, Table 3.2 shows that several of his later letters, written during the *wḥm mswt* years, are addressed to his son, Butehamon. Table 3.2 also reveals that all of
Table 3.2: Dhutmose’s possessive use by year and recipient.

<table>
<thead>
<tr>
<th>Year</th>
<th>Recipient</th>
<th>( p^1 )</th>
<th>( pr.f )</th>
<th>( nisbe )</th>
<th>( s^1 r^* )</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12 Ramesses XI (1095 BC)</td>
<td>unknown official</td>
<td>11</td>
<td>58%</td>
<td>8</td>
<td>42%</td>
<td>18</td>
</tr>
<tr>
<td>Year 2/3 ( whm) ( mswt ) (1085/1086 BC)</td>
<td>Mayor of Pe</td>
<td>3</td>
<td>43%</td>
<td>4</td>
<td>57%</td>
<td>7</td>
</tr>
<tr>
<td>Year 6 ( whm) ( mswt ) (1083 BC)</td>
<td>temple officials</td>
<td>3</td>
<td>75%</td>
<td>1</td>
<td>25%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>foremen Bakenmut &amp; Amenhotep</td>
<td>5</td>
<td>62%</td>
<td>3</td>
<td>38%</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Butehamon</td>
<td>20</td>
<td>91%</td>
<td>2</td>
<td>9%</td>
<td>14</td>
</tr>
<tr>
<td>Year 10 ( whm) ( mswt ) (1077 BC)</td>
<td>Butehamon</td>
<td>39</td>
<td>60%</td>
<td>26</td>
<td>40%</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Kery</td>
<td>1</td>
<td>25%</td>
<td>3</td>
<td>75%</td>
<td>3</td>
</tr>
<tr>
<td>Year Unknown ( whm) ( mswt ) (c. 1085-1075 BC)</td>
<td>Hafy</td>
<td>2</td>
<td>29%</td>
<td>5</td>
<td>71%</td>
<td>5</td>
</tr>
</tbody>
</table>

the tokens from Year 12 of Ramesses XI are from the same letter, the recipient of which is an unknown official.

This could mean that it is only when Dhutmose writes to officials that he uses more \( nisbe \) possessive, but an examination of the letters in the other years reveals that this is not the case. Indeed, every recipient besides Dhutmose’s son is some type of official, but Dhutmose’s rate of \( nisbe \) forms does not increase when he writes to them compared to when he writes Butehamon. It only does so in Year 12. Likewise, removing the letters to Butehamon from the data set does not change the significance of the difference between Year 12 and the other years, and observing only Dhutmose’s letters to Butehamon over the years – shown in Table 3.3 – shows no change in the rate of either nominal possessive.

Table 3.3: Dhutmose’s letters to Butehamon by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>( whm) ( mswt )</th>
<th>( p^1 )</th>
<th>( pr.f )</th>
<th>( nisbe )</th>
<th>( s^1 r^* )</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 6 ( whm) ( mswt ) (1083 BC)</td>
<td>Butehamon</td>
<td>20</td>
<td>91%</td>
<td>2</td>
<td>9%</td>
<td>14</td>
</tr>
<tr>
<td>Year 10 ( whm) ( mswt ) (1077 BC)</td>
<td>Butehamon</td>
<td>39</td>
<td>60%</td>
<td>26</td>
<td>40%</td>
<td>44</td>
</tr>
</tbody>
</table>

What Dhutmose’s letters to Butehamon do reveal, however, is that they are the letters responsible for the \( p^1 \) puzzle (the previously-noted high rate of \( p^1 \) possessives in \( whm\) \( mswt \) Year 6): in both Dhutmose’s letters to Butehamon he uses very high numbers of \( p^1 \) possessives, and only in his second letter to his son does Dhutmose use a similarly high number of \( pr.f \) possessives. The only remaining mystery here is
why this letter to Butehamon has more *p* possessives.

To uncover this and the reason for the abundance of *nisbe* possessives in Year 12 Ramesses, we must consider another possible factor: the difference in Dhutmose’s relationship with and attitudes towards these particular individuals, and whether that might have some effect on possessive choice. Indeed, an examination of the content of the Year 12 letter reveals Dhutmose’s annoyance with this particular unnamed official:⁴

*Beginning lost.* Every single day I am calling upon Amon-Re-Harakhti when he rises and sets to give you life, prosperity, and health, a long lifetime, a good ripe old age, and very many favours in the presence of Amon, your lord. To wit:

I’ve heard that you are angry and that you have caused me to be maligned(?) through slander on account of that joke which I told the chief taxing master in that letter, although it was Henuttawy who had urged me to tell some jokes to the chief taxing master in my letter. You are the case of the wife blind in one eye who had been living in the house of a man for twenty years; and when he found another woman, he said to her, “I shall divorce you because you are blind in one eye, so it is said.” And she answered him “Is this what you have just discovered after these twenty years that I’ve spent in your house?” Such am I, and such is my joking with you.

Now if you say, “Quit this!” and I were a mere freeman, Nesamon would ridicule me, and I’d have to put up with it. But should I put up with it from him now while I am an official? It is no high official who puts up with ridicule from just anybody, (not) even from his elder brother.⁵ Are you being fair with me? If I mention your name again, sure enough, you will pick a quarrel. Look here, it was when I was in the household that you were born. Please repeat any disparaging remarks I might have made about you in your father’s presence. Don’t you know the nature of my heart, that it is concerned about you, that my desire is to have your Ba remembered for my sake daily? Even if you should be vizier, I wouldn’t go aboard your ships, sure enough besides. Don’t let yourself display weakness because of the fact that Efnamon, your elder brother, has cast blame upon those things you’ve done. No fault shall be found behind my back in any matters, sure enough. Farewell! (Wente 1990: 173)

Now compare this letter to one of Dhutmose’s letters to his son, from Year 10 *wājm mswt*:

---
⁴Note that these are English translations of the Egyptian letters, done by Egyptologist Edward Wente (1967). Many constructions that are possessive in Egyptian do not necessarily correspond to a possessive in the English translation.
⁵Note that this term does not refer to an actual family member in this instance. Dhutmose is not actually this letter-recipient’s brother.
The necropolis scribe Dhutmose to the scribe Butehamon and the chantress of Amon Shed[emdua]: In life, prosperity and health and in favour of Amon-Re, King of the Gods! Every day I am calling upon the gods of the land to give you [life, prosperity and health, a] long [lifetime], and a good ripe old age, to give you many favours, and to let [me] return [and fill my em]brace with you. And further:

I have reached my superior. Really, it was only when they encountered me in the midst of Edfu that I found out he had sent a tesem-boat to pick me up. I met him at the town of Elephantine, and he told me, saying, “Another time you won’t have to come,” so he said to me. He gave me bread and beer as previously and said to me, “May Montu favour [you].” Now we are moored at Elephantine, and he keeps saying, “I shall go up (to Nubia) to attack Panehsy at the place where he is,” so he keeps saying.

Please call upon Amon of the Thrones of the Two Lands, my lord, to bring me back safe and give your personal attention to the little children of Hemisheri and Shedemdua and [give] some oil to let the little(?) children consume it. Don’t let them be in need; and give your personal attention to this daughter of Khonsmose; don’t neglect her either. But don’t worry about me. My supervisor has done everything good for me. And you are to attend to the soldiers. Don’t let them run off, nor let them grow hungry.

A further communication to the workman Amenhotep, Heramenpenaf, Paby, Pentaumte, Sedjaa, Shedsuamon, Irymal, Isis, Bakamon, Ikhtay, and the head of the ergastulum Pen-pawenher, to wit:

Please call upon Amon and the gods of the Temple (of Medinet Habu) to bring me back alive from the next war.

The scribe Ken[y]khnum to the scribe Butehamon and Amenpanefer: Every single day I am calling upon Amon to give you life, prosperity and health. And further:

Tell Amenpanefer to write a letter. Need I mention for you to engage(?) the man to receive it from him?

A further matter for the scribe Butehamon and Heramenpenaf: [End lost].

(Wente 1990: 308-309)

The first thing to note about this second letter is that it contains a rather bombastic introduction that is missing from the Year 12 letter. It is likely that this piece of the year 12 letter was lost – as indicated by the tag in square brackets – at the beginning of the Year 12 letter’s translation. But it is also possible that Dhutmose did not include as much of this type of prose, perhaps out of annoyance
with the recipient of the Year 12 letter, evident from such comments as “Are you being fair with me?” (Wente 1990: 173) and “Even if you should be vizier, I wouldn’t go aboard your ships” (Wente 1990: 173). Indeed, this appears to be the case: appeals to the gods, blessings for good health, invoking royal names and titles as a measure of good fortune and status, and prayers for the recipients are peppered throughout the Butehamon letter (e.g. “Please call upon Amon of the Thrones of the Two Lands,” “Please call upon Amon and the gods of the Temple,” “in favour of Amon-Re”), but do not appear very often in the Year 12 letter.

The reason for this could be Dhutmose’s closer relationship with his son, but previous work on Egyptian letters indicates that reetings and appeals like those in the Butehamon letter are, in fact, typical of Ancient Egyptian letters (Sweeney 2001). Furthermore, other letters reveal that Dhutmose does include these appeals in letters to other officials – for example, in this letter to the foremen Bakenmut and Amenhotep, from Year 6 w hm msrw:

The scribe of the great and noble necropolis Dhutmose [to] the foreman Baken[en]mut and the
foreman Amenhotep, the prophet Amen[...], the guardian Kadere, Pentaumte, Paby, Heram-
menpenaf, Pakhor, and all the necropolis workmen. I am calling upon Arsaphes, lord of
Heracleopolis, Thoth, Lord of Hermopolis, and every god and [every] goddess by whom I pass
to give you life, prosperity and health, a long lifetime, and a good ripe old age, and to give you
favour in the presence of gods and people. How are you? How are your people? Indeed I’m
alive today; tomorrow is in God’s hands. It is I who long to see you and to hear about your
condition daily. What’s the point of my sending you these many letters whereas you haven’t
sent even one? What have I done against you? Even if I were to have committed innumerable
wrongs, can’t one good deed make them forgotten? For I am one who is well-disposed to you;
I am not one who is ill-disposed to you.

Please call upon Amon of the Thrones of the Two Lands and Mereseger to bring me
back alive [from] the wilds of Namekhay and give your personal attention to Butehamon,
Shedemdua, her little children, and the people who are in the fields to prevent another from
doing wrong to them.

A further communication to the citizeness Tanedjeme, Nene, Hentuaa, Irymut, Isis,
Baketmut, Kerinefer, Tanedjeme, Tasepa, the barge man, and all the people: Please call
upon Amon to bring me back, for I have been ill since I arrived north and am not in my
normal state. Don’t set your mind to anything else. As soon as my letter reaches you, you
shall go to the forecourt of Amon of the Thrones of the Two Lands, taking the little children
along with you and coax him and tell him to keep me safe.

Address: The necropolis scribe Tjay to the [necropolis] scribe Butehamon.

(Wente 1990: 178-179)

<table>
<thead>
<tr>
<th>Possessum</th>
<th>nisbe</th>
<th>s1 r^c</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>plants/animals</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>objects</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>official things</td>
<td>38</td>
<td>14</td>
<td>52</td>
</tr>
<tr>
<td>family</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>people</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>actions/characteristics</td>
<td>21</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>measures/dates</td>
<td>13</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>body parts</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>gods</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>royalty</td>
<td>0</td>
<td>29</td>
<td>29</td>
</tr>
</tbody>
</table>

Table 3.4: Dhutmose’s overall nominal possessive use by possessum type.

Although the final address of this particular letter includes Butehamon, it still is evident that Dhutmose uses several more royal titles and requests more prayers in this letter than he does in the Year 12 letter – even if we ignore the introductory section from this letter that is missing from the Year 12 document. Since his relationship with the foremen of the tomb-building town is probably similar to his relationship to the official in Year 12, whom Dhutmose has apparently known since childhood, we can conclude that it is Dhutmose’s emotional state or attitude towards the letter recipient that affects his use of official- or god-related titles, prayers, and blessings. Table 3.4 illustrates that these types of possessa (gods, royalty) occur more frequently as s1 r^c possessives than they do as nisbe possessives: the Dhutmose letters’ royalty-related possessa occur 100% of the time as the s1 r^c variant, and god-related possessa occur 57.1% of the time in the s1 r^c form.6

Dhutmose’s effusive prayers and blessings in the two friendlier letters also include more frequent references to various body parts, as part of possessive phrases such as ‘my embrace,’ ‘my heart,’ and ‘the god’s hands’. These prayers are not present in the Year 12 letter, so the body part references are absent as well. Table 3.4 reveals that body parts are somewhat more likely to occur as a s1 r^c possessive than as a nisbe possessive – and as Table 3.5 illustrates, body part possessives, royalty-related and god-related possessives are lacking in the year 12 letter, while they are more prevalent in the Butehamon and Bakenmut & Amenhotep letters. We also know that these expressions do not occur 100% of the time with the s1 r^c or pr.f variants in the larger data set, as well as occurring with different possessors, so it is clear that there is still variation rather than fossilized language here.

---

6Recall that I have removed from the data set those possessive constructions that have become entirely formulaic, so the trends are so dramatic here simply because of the small data set of one individual.
### Chapter 3. Methods

#### Table 3.5: Dhutmose’s nominal possessive use by possessum category for letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep.

<table>
<thead>
<tr>
<th>Word Type: Possessum</th>
<th>Butehamon</th>
<th>Year 12 Official</th>
<th>Bakenmut &amp; Amenhotep</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>69</td>
<td>61</td>
<td>5</td>
</tr>
<tr>
<td>plants/animals</td>
<td>nisbe 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>objects</td>
<td>7 0</td>
<td>2 0</td>
<td>1</td>
</tr>
<tr>
<td>official things</td>
<td>27 10</td>
<td>1 0</td>
<td>2</td>
</tr>
<tr>
<td>family</td>
<td>8 3</td>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>people</td>
<td>2 3</td>
<td>1 0</td>
<td>2</td>
</tr>
<tr>
<td>actions/characteristics</td>
<td>10 13</td>
<td>11 4</td>
<td>0</td>
</tr>
<tr>
<td>measures/dates</td>
<td>7 11</td>
<td>3 0</td>
<td>2</td>
</tr>
<tr>
<td>body parts</td>
<td>4 2</td>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>gods</td>
<td>3 4</td>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>royalty</td>
<td>0 15</td>
<td>0 1</td>
<td>0</td>
</tr>
<tr>
<td>total</td>
<td>69</td>
<td>61</td>
<td>5</td>
</tr>
</tbody>
</table>

#### Table 3.6: Dhutmose’s overall nominal possessive use by possessor category (note the three tokens with pronominal possessors – these are non-clitic forms of the personal pronouns, and this was only seen with the 1pl and 1sg pronouns). There were no possessors in Dhutmose’s letters that were family members (e.g. ‘the brother of the mother’).

<table>
<thead>
<tr>
<th>Possessor</th>
<th>nisbe</th>
<th>s(^{1}) r(^{1})</th>
<th>s(^{2}) r(^{1})</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>royalty</td>
<td>9</td>
<td>100%</td>
<td>0 0%</td>
<td>9</td>
</tr>
<tr>
<td>plants/animals</td>
<td>2</td>
<td>100%</td>
<td>0 0%</td>
<td>2</td>
</tr>
<tr>
<td>actions/characteristics</td>
<td>5</td>
<td>71%</td>
<td>2 29%</td>
<td>7</td>
</tr>
<tr>
<td>people</td>
<td>13</td>
<td>68%</td>
<td>6 32%</td>
<td>19</td>
</tr>
<tr>
<td>official things</td>
<td>37</td>
<td>64%</td>
<td>21 36%</td>
<td>58</td>
</tr>
<tr>
<td>objects</td>
<td>19</td>
<td>51%</td>
<td>18 49%</td>
<td>37</td>
</tr>
<tr>
<td>measures/dates</td>
<td>6</td>
<td>50%</td>
<td>6 50%</td>
<td>12</td>
</tr>
<tr>
<td>body parts</td>
<td>3</td>
<td>38%</td>
<td>5 62%</td>
<td>8</td>
</tr>
<tr>
<td>gods</td>
<td>10</td>
<td>21%</td>
<td>37 79%</td>
<td>47</td>
</tr>
<tr>
<td>1pl</td>
<td>0</td>
<td>0%</td>
<td>1 100%</td>
<td>1</td>
</tr>
<tr>
<td>1sg</td>
<td>0</td>
<td>0%</td>
<td>2 100%</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Table 3.7: Dhutmose’s nominal possessive use by possessor category for letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep.

<table>
<thead>
<tr>
<th>Word Type: Possessor</th>
<th>Butehamon</th>
<th>Year 12 Official</th>
<th>Bakenmut &amp; Amenhotep</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>69</td>
<td>61</td>
<td>5</td>
</tr>
<tr>
<td>royalty</td>
<td>5 0</td>
<td>3 0</td>
<td>0</td>
</tr>
<tr>
<td>plants/animals</td>
<td>1 0</td>
<td>1 0</td>
<td>0</td>
</tr>
<tr>
<td>actions/characteristics</td>
<td>0 0</td>
<td>4 1</td>
<td>1</td>
</tr>
<tr>
<td>people</td>
<td>10 6</td>
<td>3 0</td>
<td>0</td>
</tr>
<tr>
<td>official things</td>
<td>27 16</td>
<td>3 0</td>
<td>3</td>
</tr>
<tr>
<td>objects</td>
<td>16 14</td>
<td>0 0</td>
<td>2</td>
</tr>
<tr>
<td>measures/dates</td>
<td>2 4</td>
<td>3 0</td>
<td>0</td>
</tr>
<tr>
<td>body parts</td>
<td>2 1</td>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>gods</td>
<td>6 18</td>
<td>0 0</td>
<td>1</td>
</tr>
<tr>
<td>1pl</td>
<td>0 1</td>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>1sg</td>
<td>0 0</td>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>61</td>
<td>5</td>
</tr>
</tbody>
</table>
Possessor does not appear to show very strong trends in favour of one variant or the other, as evidenced by the distributions in Table 3.6 – unless the possessor is a god, in which case it quite often occurs with the śś r r possessive; or if it is a person, which occurs more often with the nisbe possessive. Official-related possessors have more of the nisbe possessive as well, similar to official-related possessa.

These results are detailed further by the distributions in Table 3.7, which are divided again by the three recipients discussed above.

<table>
<thead>
<tr>
<th>Possessum</th>
<th>priors</th>
<th>pr.f</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>objects</td>
<td>17</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>people</td>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>plants/animals</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>measures/dates</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>official things</td>
<td>27</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>family</td>
<td>12</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>actions/characteristics</td>
<td>17</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>gods</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>body parts</td>
<td>0</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>

Table 3.8: Dhutmose’s overall clitic possessive use by possessum category (note that, in Dhutmose’s letters, no royalty-related nouns were used with pronominal possessors).

<table>
<thead>
<tr>
<th>Word Type: Possessum</th>
<th>Butehamon</th>
<th>Year 12 Official</th>
<th>Bakenmut &amp; Amenhotep</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>priors</td>
<td>pr.f</td>
<td>priors</td>
</tr>
<tr>
<td>objects</td>
<td>10</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>people</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>plants/animals</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>measures/dates</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>official things</td>
<td>22</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>family</td>
<td>8</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>actions/characteristics</td>
<td>14</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>gods</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>body parts</td>
<td>0</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>61</strong></td>
<td><strong>30</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

Table 3.9: Dhutmose’s clitic possessive use by possessum category for all letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep.

<table>
<thead>
<tr>
<th>Possessor</th>
<th>priors</th>
<th>pr.f</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3FSG</td>
<td>10</td>
<td>0%</td>
<td>10</td>
</tr>
<tr>
<td>3PL</td>
<td>16</td>
<td>94%</td>
<td>17</td>
</tr>
<tr>
<td>3MSG</td>
<td>7</td>
<td>70%</td>
<td>10</td>
</tr>
<tr>
<td>1SG</td>
<td>24</td>
<td>65%</td>
<td>37</td>
</tr>
<tr>
<td>2MSG</td>
<td>20</td>
<td>48%</td>
<td>42</td>
</tr>
<tr>
<td>2PL</td>
<td>6</td>
<td>43%</td>
<td>14</td>
</tr>
<tr>
<td>1PL</td>
<td>1</td>
<td>17%</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 3.10: Dhutmose’s overall clitic possessive use by phi features of possessor. Note that there were no 2FSG possessors in the sampling of Dhutmose’s letters obtained.
Table 3.11: Dhutmose’s clitic possessive use by possessor category for letters to Butehamon, the unknown Year 12 official, and the foremen Bakenmut and Amenhotep.

This analysis of noun type allows us to fully account for the $p^1$ puzzle as well – possessive spurt in the Butehamon Year 6 $whm\ nswt$ letter. Table 3.8 reveals that object, official, and family member possessors very much favour the $p^1$ variant, and these are much more prevalently represented with pronominal possessors in the Butehamon letters than in the two others – illustrated in Table 3.9.

Another factor to consider is the type of noun used in the possessor: as Table 3.10 illustrates, 3fsg possessors have a higher percentage of the $p^1$ variant, as do the 3pl, 3msg, and to a lesser extent 1sg possessors – and these are much more highly represented in letters to Butehamon than in the other quoted letters, as seen in Table 3.11. Likewise, in nominal possession, possessors that are god-related appear to have more $s^1\ r^r$ possessives than other categories, illustrated by Tables 3.6 and 3.7.

So while no strong claims can be made regarding lifespan change for Dhutmose, these results do provide more support for including noun type as a factor group for both possessum and for possessor and possessum. They also provide insight into how to create those factor groups.

Creating Noun Category Factor Groups

The most detailed possessum and possessor category divisions we can obtain from the Dhutmose letters are as follows:

1. dates/measures
2. objects
3. plants/animals
4. actions/characteristics
5. body parts

The category ‘body parts’ also includes the possessum ‘name’.
6. people

7. official

8. royal

9. god

Many of these divisions come from the animacy scales discussed for Arabic possessive variation: plants and animals should be less animate than people (Boumans 2006; Nichols 1988), while objects and measures/dates should be less animate than any of the former. And there are differences in these categories in Dhutmose’s letters – shown throughout, in Tables 3.4 through 3.11.

<table>
<thead>
<tr>
<th>Possessum Category</th>
<th>s, r possession</th>
<th>nisbe possession</th>
</tr>
</thead>
<tbody>
<tr>
<td>family</td>
<td>151 76</td>
<td>48 24</td>
</tr>
<tr>
<td>official</td>
<td>430 72</td>
<td>164 28</td>
</tr>
<tr>
<td>royalty</td>
<td>109 81</td>
<td>26 19</td>
</tr>
<tr>
<td>god</td>
<td>69 67</td>
<td>34 33</td>
</tr>
<tr>
<td>action/characteristic</td>
<td>129 51</td>
<td>122 49</td>
</tr>
<tr>
<td>number/date/measure</td>
<td>88 46</td>
<td>104 54</td>
</tr>
<tr>
<td>object</td>
<td>162 36</td>
<td>288 64</td>
</tr>
<tr>
<td>body/name</td>
<td>106 32</td>
<td>227 68</td>
</tr>
<tr>
<td>people</td>
<td>42 28</td>
<td>107 72</td>
</tr>
<tr>
<td>animate</td>
<td>6 18</td>
<td>28 82</td>
</tr>
<tr>
<td>Possessor Category</td>
<td>s, r possession</td>
<td>nisbe possession</td>
</tr>
<tr>
<td>body/name</td>
<td>123 73</td>
<td>45 27</td>
</tr>
<tr>
<td>god</td>
<td>373 64</td>
<td>206 36</td>
</tr>
<tr>
<td>royalty</td>
<td>126 60</td>
<td>84 40</td>
</tr>
<tr>
<td>official</td>
<td>159 56</td>
<td>126 44</td>
</tr>
<tr>
<td>action/characteristic</td>
<td>68 49</td>
<td>72 51</td>
</tr>
<tr>
<td>people</td>
<td>115 46</td>
<td>134 54</td>
</tr>
<tr>
<td>object</td>
<td>240 43</td>
<td>313 57</td>
</tr>
<tr>
<td>number/date/measure</td>
<td>42 43</td>
<td>56 57</td>
</tr>
<tr>
<td>animate</td>
<td>35 40</td>
<td>52 56</td>
</tr>
<tr>
<td>family</td>
<td>11 16</td>
<td>60 84</td>
</tr>
</tbody>
</table>

Table 3.12: Distribution of possessor and possessum by noun category.

Similarly, some of the divisions are based on alienability distinctions: body parts and names should be inalienable, followed by actions and characteristics (Nichols and Bickel 2011; Boumans 2006; Kammerzell 2000; Nichols 1988). These categories also appear to behave differently based on Dhutmose’s letters above. The overall trends for these categories in nominal possessives are illustrated in Table 3.12, while the trends for clitic possesa are shown in Table 3.13 (recall that the possessors are a small set of clitics and can therefore be distinguished by phi features rather than noun category). Note that, contra
Table 3.13: The distribution of possessum category in clitic possessives.

<table>
<thead>
<tr>
<th>Possessum Category</th>
<th>pr.ʃ possession</th>
<th>p possession</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>royalty</td>
<td>84</td>
<td>99</td>
</tr>
<tr>
<td>body</td>
<td>821</td>
<td>98</td>
</tr>
<tr>
<td>god</td>
<td>55</td>
<td>93</td>
</tr>
<tr>
<td>numbers</td>
<td>22</td>
<td>88</td>
</tr>
<tr>
<td>actions/characteristics</td>
<td>174</td>
<td>82</td>
</tr>
<tr>
<td>object</td>
<td>249</td>
<td>63</td>
</tr>
<tr>
<td>family</td>
<td>174</td>
<td>57</td>
</tr>
<tr>
<td>official</td>
<td>60</td>
<td>39</td>
</tr>
<tr>
<td>people</td>
<td>44</td>
<td>43</td>
</tr>
<tr>
<td>animate</td>
<td>20</td>
<td>53</td>
</tr>
</tbody>
</table>

Kammerzell (2000) and Egedi (2010), it is already evident that no split is fully categorial; variation is possible in any category, although royalty and gods to come very close to categoricity in clitic possessives. It is also evident that these, the only two near-categorical ones, do not come across as strikingly alienable or inalienable – an unexpected result, if the split between possessive variants were based on alienability as suggested by Kammerzell (2000) and Egedi (2010).

It is not advisable to keep such a large number of factors in one factor group for reasons of statistical rigour, so these groups must be consolidated. As for how to consolidate, it is also evident from Tables 3.12 and 3.13 that some categories can be combined due to their similar behaviour and/or semantic similarities. For nominal possessives’ possessum categories, these divisions are as follows:

1. family, royalty, official, and god: high-status nouns
2. body/name: intrinsic
3. people and animate: people, animals, plants
4. other

Here, the first three noun types – god, royalty, and official – have been combined due to their similar distributions (shown in Table 3.12), as well as due to their semantic similarities: all of these types of possessa would have higher status in Egyptian society than other categories would. The importance of these three types of possessa will also be discussed in further detail below, at the end of this section. While family relations were not necessarily as important as royalty, gods, or official nouns, they were still strongly valued in Egyptian society (Kemp 2006; Brewer and Teeter 2001). Because of this and the fact that these nouns patterned similarly to the other high-status nouns in their distributions (see Table 3.12), they were included in the high-status category as well.
Body parts and names were kept separate due to their distributional results (shown in Table 3.12), but also due to alienability predictions: these types of possessa are the most likely to be inalienable, if the classifications of Nichols and Bickel (2011); Boumans (2006); Nichols (1988) and the predictions Kammerzell (2000) are correct for Egyptian. Non-royal, non-official, non-god people were combined with the other animate nouns because the distributions are similar (see Table 3.12), and they are semantically related in that all are animate. This will also take into account the animacy constraints seen in English genitives (Jankowski and Tagliamonte 2014; Rosenbach 2008, 2005; Biber et al. 1999; Ljung 1997). The “other” category encompasses the remainder of the nouns.

For nominal possessives’ possessor categories, the divisions are as follows:

1. body/name, god, royalty, official: high-status nouns
2. other
3. family

Again, these new categories are based partly on distributional similarities (see Table 3.12) and partly on semantic similarities. Alienability will have no effect on possessors since a noun’s alienability is a characteristic of possessum only, so in this case the body parts/names category can be combined with the god, royalty, and official possessors. However, unlike in the possessum distributions, the family possessors did not pattern with the high-status nouns in their distribution of possessive variants (shown in Table 3.12), so they were kept separate. I did not combine them with the “other” category due to the value placed by Egyptians on family relations. Also in contrast to the possessum category patterns, animate noun possessors that were not in the high-status category did not pattern differently from the “other” nouns (shown in Table 3.12), and so were grouped together.

For clitic possessives’ possessum categories, the divisions are as follows:

1. royalty, body/name, god: high-status
2. numbers, actions/characteristics, objects: other
3. family, official, people, animate: animate/official

As with nominal possessives’ possessa, I separated “high-status” from the other animate nouns. However, in this instance, family and official nouns patterned too closely with the animate and people nouns, and were too dissimilar in their distributions from gods, body parts, and royalty for me to combine them with the other three high-status categories (shown in Table 3.13). Therefore, they are combined
with the remaining animate nouns. Indeed, all but eight of the official possessa in my clitic possessive dataset were animate (and people at that), so it appears that for clitic possessives, the distinction between official people and ordinary people is not preserved as it is for nominal possessives. This division for clitic possessives’ possessa still separates out the nouns that would have the highest status in Ancient Egypt: god- and royalty-related nouns.

Now that these categories have been established, there is one remaining issue to discuss: the reasons that neither the alienability constraint nor the animacy constraint form the basis for the royalty, god, and official noun types. The Dhutmose letters indicate that at least the first two of these categories behave differently than the other categories, an indication that they should not be combined with, for example, “people.” Additionally, these three categories all include both animate and inanimate possessors (either physical or abstract objects, or characteristics/actions). Examples of possessa from the god, royalty, and official categories are shown in (11-a),\(^8\) (11-b), and (11-c), respectively. For each set of examples, both variants are found in the dataset; these examples are part of the variation, and are not categorically split one way or the other.

\[\text{(11) a. } \text{dšr st} \]
\[\text{holy.MSG place.FSG} \]
\[\text{‘holy of place’} \]
\[\text{(Wente 1990: 9)} \]

\[\text{b. } \text{nswt towy} \]
\[\text{throne.FPL land.MDU} \]
\[\text{‘thrones of the two lands’} \]
\[\text{(Wente 1990: vs.6)} \]

\[\text{c. } \text{tjwyt n wsjr} \]
\[\text{FSG.DEM office.MSG NISBE-MSG Osiris} \]
\[\text{‘the office of Osiris’} \]
\[\text{(Wente 1973: 4,5 recto)} \]

In contrast, animate examples of possessa from the god, royalty, and official categories are shown in (12-a), (12-b),\(^9\) and (12-c), respectively.

\[\text{8We know that the possessum ‘holy’ here functions as a possessed noun rather than an adjective because it (masculine, singular) does not agree in gender and number with the possessor, ‘place’ (feminine, singular), as all Egyptian adjectives do (Allen 2010; Hoch 1997; Gardiner 1957); nor does it follow the noun (‘place’), as all Egyptian adjectives do (Allen 2010; Hoch 1997; Gardiner 1957).} \]

\[\text{9While nsw (‘king’) from this example and nswt (‘thrones’) from the last example look quite similar in transliteration, they are easily distinguishable in the original hieroglyphic/hieratic: they are written using different determinative signs} \]
(12) a. n³ ntrw n p³ t³
   PL.DE  M god.MPL NISBE.MSG MSG.DE  M land.MSG
   ‘the gods of the earth (lit. land)’
   (Wente 1990: 9)

b. nsw ntrw
   king.MSG god.MPL
   ‘king of gods’
   (Janssen 1991: 1,5-8)

c. p³ šmsw n(j) nb
   MSG.DE  M bodyguard.MSG NISBE.MSG lord.MSG
   ‘the bodyguard of the lord’
   (Griffith 1898: 80)

Inanimate possessors for royalty, and official categories are shown in (13-a) and (13-b), respectively.\(^\text{10}\)

(13) a. t³ mdw(t) n(t) p³ j jnj
   FSG.DE  M word.FSG NISBE.FSG MSG.DE  M red-crown.MSG
   ‘the word of the red crown’
   (Wente 1990: vs.4)

b. (j)m(j)-r’ rwyt ntxj
   overseer-MSG ruit-hall.MSG Nekhti
   ‘overseer of the ruit-hall, Nekhti’
   (Luft 1992: 1)

And animate possessors for god, royalty and official categories are shown in (14-a), (14-b), and (14-c), respectively.

(14) a. ãnw n hrw
   phallus.MSG NISBE.MSG Horus
   ‘the phallus of Horus’
   (Wente 1973: 11,7)

b. n³-n ãbsw n pr⁻¹³
   PL.DE  M clothing.MPL NISBE.MSG pharaoh.MSG
   ‘the clothes of the pharaoh’
   (Faulkner 2009: 139).

\(^{10}\)There we no inanimate possessors for the god category in my token set.
Chapter 3. Methods

(Gardiner 1981: 10,9)

c.  t;   mdwt   n(t)   w:b
    MSG.DEM word.MSG NISBE.FSG w:b-priest.MSG
    ‘the word of the wab-priest’

(Demarée 2006: pl. 21-22)

It is possible to remove these categories and split these possessa and possessors into the already-existing categories such as “people” or “animate” for animate possessa/possessors and “objects” and ”actions/characteristics” for the inanimate possessa/possessors, but this would not be true to the data. The Dhutmose letters themselves make the case for keeping god- and royalty-related possessum and possessor groups separate rather than splitting their animate and inanimate members into the other categories: most of these examples occur with the s° r° possessive or pr.f possessive – unlike objects or actions/characteristics, which appear to have a more even split.

However, we must also give weight to the thoughts and attitudes of the Egyptians themselves, for it is the goal of sociolinguistic research to study language within its sociocultural context. Recall that hierarchy in Egyptian society was very important, and that speaking “well” was something that Egyptians valued very highly – thus the rise of the wisdom literature instructing social climbers how to act (Fischer-Elfert 2003: 119-121). In that vein, we also know that Egyptians valued social status, demonstrated by such things as official titles and various ornaments of office – evidenced in part by the sheer number of attested titles, many of which are possessive constructions (Ward 1982; Fischer 1985), and in part by the knowledge we have of how respectfully and ritualistically important objects were treated (Kemp 2006; Allen 2005; Grajetski 2003; Pinch 1995; Smith and Simpson 1998). Given this information about Ancient Egyptian culture, it becomes clear that these types of entities – gods, royal people and titles, official titles, and objects that were official, royal, or religious in nature – would all have been given considerably more importance than ordinary objects, traits, or people. Therefore, it is more in keeping with Egyptian cultural assessments to separate not only god-related and royalty-related nouns, but official ones as well. And, as sociolinguistic research endeavours to include the sociocultural context in which a language was used, keeping these three categories separate from the others – thereby highlighting the Egyptian contexts within which these texts were written – is also in line with sociolinguistic research goals.
Summary

After describing the animacy and alienability constraints in the possessive literature, I then described the distribution of Egyptian noun types in both the individual Dhutmose and the larger dataset of possessives. Based on Dhutmose’s distribution of possessive variant by noun type, I created possessum and possessor categories which were also informed by the animacy and alienability constraints discussed in possessive literature, on distributions in the larger dataset, and on the values held by Egyptians themselves.

Those factor groups are as follows (excluding clitic possessors, which are categorized by their phi features):

Possessum Category: Clitic Possessives

For clitic possessives’ possessum categories, the divisions are as follows:

1. royalty, body/name, god: high-status
2. numbers, actions/characteristics, objects: other
3. family, official, people, animate: animate/official

Possessum Category: Nominal Possessives

1. family, royalty, official, and god: high-status nouns
2. body/name: intrinsic
3. people and animate: people, animals, plants
4. other

Possessor Category: Nominal Possessives

1. body/name, god, royalty, official: high-status nouns
2. other
3. family

Importantly, this discussion and the creation of these factor groups also shows that none of the factors within each group showed a categorical distribution in any way (see Tables 3.12 and 3.13, and the examples that follow them). That is, there is no categorical split in either possessive variable in terms of animacy, alienability, or high status – there is real variation in each possessive variable, making
these two variables viable for comparison, the main goal of my study. As variation has been shown to exist in this dimension, I now provide a description of the remaining factor groups I have chosen, and an overview of the statistical tools I use to provide the results in the following chapter.

3.5 Coding Other Factor Groups

Following and improving on Gardiner (2014, 2015b), all clitic possessives were coded for the following factors:

1. time period by dynasty
2. provenance of text
3. text type
4. script type
5. phrase complexity
6. possessor clitic phi features
7. possessum category

Demonstratives were coded for the same factors, except possessor and possessum, as they do not possess either of these. They were coded for noun type using the same categories as were given for clitic possessum category. Possessum category as a factor group has been discussed at length above and needs no further discussion here.

Likewise, clitic phi features as coded for clitic possessives are simply the most straightforward way of categorizing possessor type in this variable. My reasons for including the other factor groups, as well as a description of how they were measured, are as follows.

Time period is a necessary factor because we know from Gardiner (2017), Gardiner (in press), Gardiner (2015b), and Gardiner (2014) and as well as from general Egyptological scholarship that, in clitic possession, the $p$ possessive replaces the direct genitive over time. Therefore, time period is a necessary factor to be sure these findings are replicable. Each token was coded for the dynasty in which it was written, which were then combined as follows:

1. Dynasties 11-14: Middle Kingdom
2. Dynasties 17-18: Pre-Amarna New Kingdom
3. Dynasty 19: Post-Amarna New Kingdom

4. Dynasty 20: Ramesside Period

These divisions were made for several reasons. First, these time divisions allow testing of the Egyptological hypothesis that the possessive comes into existence during the Middle Kingdom, and that it is more prominent after the Amarna Period (Kupreyev 2013). Second, they make sense from an Egyptological perspective: the Middle Kingdom is a fairly unified period socially and politically, and the Ramesside Period is also discussed on its own as a unit (Gardiner 1964; Redford 1992, 1970). And while Dynasties 18 and 19 must be separated to test the Kupreyev (2013) claim that possessives become more prevalent after the Amarna Period, I have endeavoured to keep them separated in an Egyptologically relevant way: I include tokens from Tutankhamun’s ten-year reign and his successor Ay’s four-year reign as part of the Amarna Period as well. Therefore, they are grouped as part of the Pre-Amarna New Kingdom. As for Ay’s successor Horemheb, I include him as part of the Post-Amarna New Kingdom; his attitudes were much more in keeping with the traditions of Dynasty 19, and indeed it is Horemheb’s choice of heir, Ramesses I, who begins the unbroken hereditary line that comprises Dynasty 19. For the purposes of language attitudes relevant to this study, it is therefore more appropriate to count Horemheb with the rest of Dynasty 19.

Provenance of text is necessary to be able to test the hypothesis that has been brought forward occasionally by Egyptologists to account for the emergence of the possessive: that the pre-nominal article in both demonstratives and possessives is a result of dialect differences (Allen 2013). If this is true, we would expect to find evidence of the demonstrative and possessive variants emerging first in one particular region, and then spreading across the rest of Egypt. For the purposes of this project, Egypt was divided first into Upper and Lower Egypt, as per traditional Egyptological methods – the 13 nomes (provinces) of Lower Egypt and 22 nomes of Upper Egypt. But because Upper Egypt encompasses a larger territory than does Lower Egypt, and because I had more tokens from a wider variety of Upper Egyptian cities, I also divided Upper Egypt into two parts: Upper Egypt North and Upper Egypt South. Upper Egypt South is comprised of nome 10 southward to nome 1. It includes Abydos, Naqada, Koptos, Thebes, and Hierakonpolis. Upper Egypt North is comprised of the remaining Upper Egyptian nomes, from 11 to 22, and includes Meydum, Herakleopolis, Hermopolis, Asyut, and Amarna. I also obtained tokens from Nubia.

Text type must be coded for in order to replicate the results of Gardiner (2014), Gardiner (2015b),

---

11 There are a very small number of tokens (N < 20) from either the end of Dynasty 20 or the very beginning of Dynasty 21, but these are included with the tokens from Dynasty 20 due to the fact that there are too few of them to include separately.
Gardiner (2017), and Gardiner (in press), as well as to expand upon them in order to better test the hypothesis that text type is a linguistic context that affects possessive variant choice. As only two text types were used in the previous studies, it is important both to replicate the previous findings and to add more text types for a more accurate representation of this factor’s effect on the variable. Additionally, this factor group will also determine whether the metadata we have about possessive and demonstrative prf stigmatizing it curbs its use in more formal texts. That is, the factor group will give us more information about potential stylistic and register effects.\footnote{While text type is a measure of register generally, I use it here as a stand-in for style because we have no other way of measuring style in Ancient Egyptian. Therefore, I will use style and register interchangeably here when referring to text type and its effects on variant choice.} I hypothesize that the older prf possessive and pn demonstrative will be favoured in more formal texts, as per Gardiner (in press), Gardiner (2015b), and Gardiner (2014), and in keeping with the metadata we have about the pn variants. Each token, therefore, was coded for the type of text in which it occurs.

I include script type as a factor because, while hieroglyphic is generally used for formal texts and hieratic generally for less formal texts (and in Gardiner (2014) and Gardiner (in press) text type and script type did match with text type), this is not always the case: formal texts such as magical/medicinal texts could be circulated on papyrus, and this medium was often the realm of hieratic. Therefore, to remove any potential confounding influence of script type on text type, each token will be coded for the type of script in which it is written. Only hieratic and hieroglyphic texts will be considered in this project; Egyptian’s other two writing systems – Demotic and Coptic – had not yet been invented during the investigated period.

Finally, phrase complexity was also included. This factor is necessary to include in order to test the Continuity Hypothesis that stable variation is stable because it is influenced by a continuous factor (Wallenberg 2013; Fruehwald and Wallenberg 2013): a continuous factor must be included in the analysis of nominal possession, which is predicted to be stable. In keeping with the Continuity Hypothesis, this factor should be significant in nominal possession, but not necessarily so for clitic possession. I have chosen phrase complexity in part based on the syntactic structures and their constraints, discussed in the previous chapter, and partly because it is the best representation of those structures’ constraints that is available to us. We cannot, for example, use phonological weight or word length as a measure of complexity because Egyptian writing does not include vowels – we have no way of knowing what kinds of syllables are possible in Egyptian. Because of this restriction, we have no way of being certain about the actual length of a given word, or about the number of vowels it may have and where in the word these vowels were located.

For complexity, each token was coded for the number of additional elements it had. This was mea-
sured thusly: any word not necessary to create that possessive variant was counted as +1 complexity. For example, the clitic possessive in (15-a) would have a complexity score of 0 (nothing but possessor + possessor clitic), while the clitic possessive in (15-b) would receive a complexity score of +1. Any additional element, such as a second modifying adjective, added an extra complexity point – so a possessive construction with two modifying adjectives would receive a complexity score of +2, +3 for three additional elements, and so on. This is elucidated with further examples in the nominal possessive section below; those constructions were more likely to have higher complexity scores than were clitic possessives.

(15) a. (j)ht=jnb
thing.MSG=1SG every.MSG
‘all my property (lit. my every thing)’
(James 1962: pl. 1-4)

b. hrt=k
condition.FSG=2MSG
‘your condition’
(James 1962: pl. 24-25)

For possessives, complexity score of 0 is given when there is a demonstrative, a clitic, and a possessum – as in (16-a). Complexity score increases by 1 with each additional element, such as in (16-b), which has a score of +1.

(16) a. p=j=ndy
MSG.dem=1SG Medjay
‘my Medjay (a title)’
(Smither and Gunn 1945: 2-3)

b. p=y=knb
MSG.dem=2MSG lord.MSG good.MSG
‘your (masc.) good lord’
(Smither and Gunn 1945: 2-3)

That is, as shown, complexity is measured by anything additional, not including the elements required for the construction. It was somewhat evident even before the analysis that this factor would not be significant in a continuous way for clitic possession: there were 2092 clitic possessive tokens with a
complexity score of 0, but only 124 with a complexity score of 1 or more. No tokens had a complexity score of more than 2 – clitic possessives are simply not attested with higher complexity score the way that nominal possessives are. Therefore, complexity could not reliably be treated as continuous for clitic possessives.

In demonstrative variation, a complexity score of 0 is a demonstrative and a noun, as in (17-a), and anything additional adds 1 point to the score as in (17-b), which has a score of +1; noun-less demonstratives (e.g. ‘I told you this’) were given a complexity score of -1, as in (17-c).

(17) a. n\textsuperscript{3} k\textsubscript{pw}
PL.DEM pupil.MPL
‘these pupils’
(Luft 1992: 8)

b. pA jrt bjuw
M.DEM doing.MSG evil.MPL
‘these evil doings (lit. doing of evils)’

(c. jri n=f m
do.IMP for=3MSG PL.DEM
‘do this for him’
(Simpson 1999: K2)

Again, because the $p^\text{1}$ possessive is created using the $p^\text{1}$ demonstrative, demonstrative tokens will all be coded for the same factor groups discussed above, with the exception of possessor phi features, as these are not present in non-possessive demonstrative constructions. Because of these structural similarities, it is my hypothesis that the same factors that condition the $p^\text{1}$ possessive will also affect the $p^\text{1}$ demonstrative in a similar way. Showing that these similarities exist will help track the emergence, progression, and diffusion patterns of $p^\text{1}$ in general, allowing us to understand the contexts in which $p^\text{1}$ possessive first emerged and where and how they spread.

### 3.5.1 Nominal Possession

Nominal possessive tokens were coded similarly to clitic possessives. The following factors were coded for each token:

1. time period (by dynasty)
2. provenance of text
3. text type
4. script type
5. possessum category
6. possessor category
7. phrase complexity

As previously discussed at length, possessum and possessor category should have an effect on variant choice. These need not be addressed again here, but the explanations of the remaining factor groups are provided below.

Since nominal possession is predicted to be stable, time period must be included to determine whether the ratio of $s\ r\top$ to nisbe possessive changes over time. In a similar vein, the rates of these two possessives over time must also be compared to the rates of the clitic possessive variants over time for comparison of stable variation to variation that leads to language change.

As discussed in the literature on stable variation, style is often a conditioning factor for stable variables (Fruehwald and Wallenberg 2013; Wallenberg 2013; Wagner 2012; Labov 2001), whether it is treated as continuous or not. Therefore, I expected text type to have some effect on nominal possessive selection, despite not having any metadata on style or register affecting nominal possessives. I predicted that magical texts and fairy tales would have more $s\ r\top$ tokens than letters would, in keeping with Egyptological descriptions of the $s\ r\top$ possessive as existing in parallel to the $pr.f$ possessive, which is claimed to be a formal variant (Egedi 2010; Kammerzell 2000). Additionally, based on the preliminary data in the previous section, there is likely to be a lexical effect: texts likely to contain more references to deities or royalty – magical texts and fairy tales – would have higher numbers of $s\ r\top$ possessives than the remaining text type, letters.

Though this not expressly mentioned in the literature for nominal possessives, provenance was expected to be significant for clitic possessives, so it was included as a factor here for comparison. It was also useful to include this factor because previous work suggests that Egyptian nominal possession parallels clitic possession in many ways (Kammerzell 2000). If the parallels between nominal and clitic possession that were suggested in previous work hold for regional variation as well, then the trend should be that $s\ r\top$ possessives behave similarly to $pr.f$ possessives while nisbe possessives should pattern with $p\top$ possessives. That is, locations which favour $pr.f$ possessives should also favour $s\ r\top$ possessives, and likewise for nisbe and $p\top$ possessives.
Phrase complexity is the linguistic factor introduced specifically for nominal possession – and indeed, the complexity scores of nominal possessives go as high as 12. Since *nisbe* (adjectival) possession is possession via adjunct, and therefore lends itself to including as many additional elements as one would like, my prediction was that, as the phrase becomes more and more complex (i.e. as the complexity score increases from 0), the *nisbe* form should become increasingly prevalent over the *s* • *r* form. This prediction is just as much a statement of the ease with which adjectival (*nisbe*) possession can add elements to its structure as it is a statement of how difficult it would be for the processing of the structure of a *s* • *r* possessive with too many elements; in the *s* • *r* structure, there are only so many places for extra elements to go, and there is more head movement required than in the *nisbe* possessive. The adjunctive nature of the *nisbe* adjective therefore lends itself more readily to more complex phrases.

### 3.5.2 Statistical Analysis

The analyses conducted on all token sets were similar to Gardiner (2014), Gardiner (2015b) and Gardiner (2015b). They included distributional and multivariate analyses of each set. These analyses reveal which factors have an effect on variant choice, and to what extent. There were three datasets to compare: nominal possession, clitics possession, and demonstratives. The analyses were conducted using the programming language R – specifically the package Rbrul (Johnson 2015), and the package partykit. The first of these allows for powerful comparisons of multiple datasets, and detailed analyses of factor interactions. It is the package through which I conduct distributional and multivariate analyses. It also allows modelling of some factor groups as continuous rather than discrete.

When conducting these analyses, I investigate the three lines of evidence that are important to variationist sociolinguistic research: statistical significance, hierarchy of constraints, and relative strength of the effect (Tagliamonte, 2006, 235). These comparisons allow me to test the various hypotheses discussed previously. The major hypotheses are repeated as follows, broken down here into further detail.

1. Under the proposal that language change and stable variation both arise from the same process, namely competing grammars, the only thing that allows variation to remain stable is the type of factor that governs it (the basic premise of the Wallenberg (2013) and Fruehwald and Wallenberg (2013) proposal). Therefore, I predict that Egyptian stable variation will be constrained by at least one continuous factor group.

2. I predict that nominal possessives in Egyptian are an instance of stable variation, which means that their variation should be constrained by a continuous factor. I predict that that continuous
factor group is phrase complexity.

3. I predict that clitic possessives in Egyptian are an instance of language change, as per the previous literature.

4. I hypothesize that the $\textit{p}$ possessive derives from an older language change, with the pre-nominal $\textit{p}$ demonstrative alternating with and replacing post-nominal demonstratives. From this, it follows that the same factors which constrain $\textit{p}$ possessives should also constrain $\textit{p}$ demonstratives.

5. Since the $\textit{p}$ forms of the demonstrative and clitic possessive appear to have been stigmatized, I predict that the more formal magical texts will disfavour these variants.

6. Since there is no stigma that we know of for nominal possessives, I predict only that texts with more god-related and royalty-related nouns – magical texts and fairy tales – will favour the $\textit{s}$ possessive, as per the preliminary information discussed with the Dhutmose Letters.

7. I predict that the innovative $\textit{p}$ forms in both clitic possession and the demonstrative variation are a result of dialect differences and/or language contact, as per Egyptological literature. I hypothesize that some locations will favour the new variant early in the change, while later in the change it will have spread across all locations.

8. I predict that possessive variation in both clitic and nominal possessives will be constrained by possessum category, as per the Egyptological claims and previous literature on possession in other languages. Similarly, I also predict that possessor category will have an effect.

9. I predict that nominal possessives are a different variable from clitic possessives, and therefore will not necessarily be affected in the same way by the same constraints as clitic possession, including in the above prediction. That is, nominal possessives may not show the same split with the same nouns as clitic possessives do.

First, Rbrul was used to run distributional analyses of each of the three dependent variables – clitic possessives, nominal possessives, and demonstratives.

Distributional results indicate how many tokens occur in each slot – for example, there may be 1000 $\textit{p}$ possessive tokens, with 400 of these occurring in the New Kingdom, 200 occurring with the first person singular subject, etc. It is important to include distributional results because they inform us about overall trends, total numbers, and which slots are very full or very empty. (For example, we have very few tokens from Lower Egypt for the Middle Kingdom, Dynasties 11-14). Distributional results are also important for checking the models produced by regression analysis – we know that confounding
factors have been eliminated when the variants are ranked the same by percentage (distributional results) as by factor weights (regression results). This information also gives us the first indication of whether the same factors appear to govern both language change variables.

Second, I conducted mixed effects logistic regression analyses (also called multivariate logistic regression, or multiple logistic regression) on each of the three data sets, again using Rbrul to do so. Mixed effects models are the most common way of analyzing sociolinguistic data: the choice between variants is the dependent variable, while all the possible contributing factor groups are independent variables. Since each variant choice is a discrete outcome rather than a continuous outcome, linear regression is not possible in this scenario – logistic regression is required for binary dependent variables. In any given logistic regression analysis, the independent variables (in this case the factor groups discussed above), can be discrete or continuous. In this study, some are continuous (like phrase complexity), while others are discrete (like text type).

It is the logistic regression analysis that allows us to follow the three lines of evidence used in sociolinguistic studies: first of all, the results of this analysis reveal which factor groups affect variant choice to a degree that is statistically significant, our first line of evidence. “Statistically significant” means that the pattern of influence on variant choice shown by that factor group is very unlikely to have been obtained “accidentally.” This is measured by a $p$-value, which is the probability that the outcome is due to chance rather than a real effect. In most scientific disciplines, the accepted value for significance is a $p$-value of less than 0.05, which means that there is less than a 5% likelihood that your results only look the way they do due to random chance.

Another, major way I investigate significance is logistic regression in Rbrul. It simultaneously analyzes each factor group’s effect on outcome (variant choice), and the results indicate which factor groups have a significant effect. The results of this analysis in each data set indicate which factor groups affect variant choice in clitic possessives, nominal possessives, and demonstratives. These first results of the logistic regression analysis tests all my hypotheses by indicating which factors significantly affect variant choice in each of the variables.

Rbrul’s logistic regression analysis also outputs values called “factor weights.” This is where I obtained the second line of evidence: the hierarchy of constraints (factors). We already know whether a given factor group can predict variant choice; factor weights will tell us how. Recall that each data set has two variant choices as its dependent variables. In Rbrul one of these choices must be set as the “application value,” which means that any factor in a given factor group that favours this choice will have a high factor weight, while any factor that disfavours this choice and (therefore favours the other variant) will have a low factor weight. For example, in Gardiner (2014, 2015b) found that so-called inalienable nouns
favoured the \( pr.f \) possessive while inalienable nouns favoured the \( ps \) – the application value was the \( pr.f \), so inalienable nouns had a high factor weight, while alienable nouns had a low factor weight. The value of a factor weight is always a number between 0 and 1, where 0 is a low probability of the application value occurring and 1 is a high probability of the same. The factor with the highest weight affects variant choice in the opposite way from the factor with the lowest weight, and every factor in a given factor group is ranked from the one with highest factor weight to the one with lowest factor weight. This allows us to determine which factors favour which variant in each group. This step informs us whether later time periods favour the \( ps \) possessive and demonstrative more, and how much \( ps \) increases over time. It also shows us whether one region favours the \( ps \) demonstrative and/or possessive, and whether the weights and significant factors are the same for clitic possessives as for demonstratives.

This line of evidence also ties in with the third one: relative strength of the effect. While significance tells us whether the factor group affects variant choice at all, and constraint ranking tells us how each significant group affects variant choice, relative strength measures how much each factor group influences the choice of variant. That is, even if a factor group is statistically significant, meaning it does affect variant choice, it may not have a strong effect on variant choice. We can discover whether a factor group has a strong or weak effect on variant choice by looking at the range of factor weights in each group. A factor weight is the probability of getting the application value in the given context, and their measures range from 0 to 1 – for example, if the group text type has a range of factor weights from 0.2 to 0.9, that is a very strong effect. Conversely if the group script type has only a range of 0.4 to 0.5, it is a weak effect. In other words, when the factor weights converge near 0.5, the effect is weak; when the weights range from almost 0 to almost 1, the effect is strong. Observing the range of factor weights in this way allows us to determine which factor groups play the biggest role in variant choice for any given variable. This step tests my hypotheses in terms of the strength of their effect, if any — it provides insight into how much each time period and location favour each variant, and it reveals whether the same factors affect the pre-nominal demonstrative \( ps \) as the possessive \( ps \) to the same degree.

I also report the log odds from my analyses of effect size (relative strength) and direction (constraint hierarchy). These have the same function as factor weights do: they inform us about which factors in each group favour which variant, and how strongly. However, instead of beginning at 0.5 and progressing towards 1 or 0 as factor weights do, log odds begin at 0 and progress infinitely either upwards into positive values or downwards into negative values. For example, a log odd of -1.845 disfavours the application value, while a log odd of 2.675 favours the application value. While these serve the same purpose as factor weights, they are included so as to make the research more accessible to readers in other scientific fields, for whom log odds rather than factor weights are the norm. Log odds also reveal the relative
magnitude of effects of different factor groups – a good way to compare effect sizes across factor groups. Additionally, log odds are necessary to include because the effect size and direction of the continuous factor, phrase complexity, is only reported in log odds.

It should also be noted that for all three datasets, tokens of unknown provenance and tokens from Nubia were both coded with the /, which indicates that their results will not be considered by the Rbrul statistical programs in the Provenance factor group, but are considered in the rest of the analysis. This was done for two reasons. First, the Nubian tokens were too few in number, only 17, and would skew the analysis of the Provenance group. Second, the tokens whose provenance is unknown are not necessarily all from the same location, so grouping them together in terms of location for the statistical analysis would not be scientifically sound.

Third, to investigate interactions between factor groups, I use R’s partykit package to create conditional inferences trees – a method of recursive partitioning. Recursive partitioning creates a “decision tree” that classifies outcomes by splitting the data set into subsets based on whichever independent variables the user tells it to include (Hothorn et al. 2015). In this case, these variables are the social and linguistic factor groups outlined above. This partitioning is considered recursive because, theoretically, each subset can be split indefinitely. Recursive partitioning has been a popular tool in regression analyses conducted in other scientific fields for over a decade (Hothorn et al. 2006).

Conditional inference trees are used here for two reasons. While the results of the distributional and logistic regression analyses can provide us with an understanding of which factors are significant and which factors have the strongest effects, conditional inference trees and random forests can provide a) the importance of each factor group, providing more support for effect strength in addition to factor weights and log odds; and more importantly, b) “the conditional inference tree reveals how interactions and predictors operate in tandem. Indeed, the hierarchical organization of the variable grammar (social and linguistic) is laid out in panoramic relief” (Tagliamonte and Baayen 2012: 33). That is, since the data presented in the mixed effects results tables are very complex, conditional inference trees are used here to provide a visually straightforward representation of the logistic regression results: they are used to elucidate the statistical results obtained via mixed effects logistic regression, by showing how several factor groups operate in combination to predict variant choice. This was especially useful for showing changes across locations over time.

Finally, I also use Graphpad’s statistics programs Prism and for several calculations. I use QuickCalcs to conduct Fisher’s Exact Tests in order to determine whether several pairs of numbers have a statistically significant difference between them, and I use Prism to model logistic functions – the S-curves that represent the increase of a new linguistic form over time. These will be used to illustrate both language
change scenarios. I use these functions to analyze the rate of change in three sociolinguistic contexts for clitic possession, showing that the trajectory of the innovative $p^i$ is typical of language change, making the clitic possessive variable a suitable comparison point for the stable nominal possessive variable. Modelling the change (the increase of the $p^i$ possessive) with a logistic function allows us to find the slope of that function, which measures the rate of change (in this case, the rate of increase of the $p^i$ possessive in various contexts). This tests the Constant Rate Effect (Kroch 2005; Santorini 1992; Pintzuk 1991), the idea that any innovative form will increase at a constant rate – i.e. that the slopes of the logistic function will be the same – no matter the sociolinguistic context. Once the slopes for each equation have been calculated, I then conduct a one-way ANOVA (analysis of variance) to determine whether the slopes are significantly different from each other. A one-way ANOVA compares the average (mean) values for three or more sets of measurements of a value, and determines if those sets are significantly different from each other. In this case, the sets are the confidence intervals for the rates of increase of the $p^i$ variant in several contexts. That is, I use the means of the confidence intervals for each of the slopes to create the graph of each logistic curve, and then I compare those means via one-way ANOVA to determine whether they are statistically significantly different from each other. If they are not, the slopes for each context can be considered the same, and therefore the rate of increase can be considered the same for each context.
Chapter 4

Results

Now that I have provided the relevant background information, I come to my statistical results. First, I use a test of the Constant Rate Effect to show that the $p\text{ }$ possessive in clitic possession behaves the same way as a typical innovative variant in a typical language change situation, and therefore is suitable for comparison to the stable nominal possessive variable. Second, I discuss the effect of various factors (independent variables) on clitic possession and how these relate to the variables that constrain demonstrative variation, using demonstrative variation as well in order to map the emergence and trajectory of the innovative $p\text{ }$ variant across Egypt over time in both change variables. Finally, I discuss the factors constraining nominal possession, showing also that nominal possession is in fact stable variation – or at least, much more stable than clitic possession – and test the Continuity Hypothesis on both nominal and clitic possessives.

4.1 The Constant Rate Effect: Clitic Possession is a Typical Change Variable

Recall that previous literature has shown that the rate of increase of a new linguistic form over time will take the shape of an S – a logistic curve (Kroch 2005; Pintzuk 2003; Santorini 1992; Pintzuk 1991; Kroch 1989). The new form’s rise in usage is slow at first, then takes off dramatically for a time, and finally plateaus or replaces the old form completely. Recall also that the rate of increase of the new form – the slope of the logistic curve – should be the same across linguistic contexts, even if its initial frequency differs across contexts (Kroch 2005; Pintzuk 2003; Santorini 1992; Pintzuk 1991; Kroch 1989). That is, the new form should increase at a constant rate across linguistic contexts. This is the basis of
Chapter 4. Results

117

the Constant Rate Hypothesis (Kroch 2005; Pintzuk 2003; Santorini 1992; Pintzuk 1991; Kroch 1989). “Linguistic context” in this instance generally refers to various linguistic factors which constrain the variation, such as clause type or subject type (Tagliamonte 2011: 83).

Gardiner (2015b) finds evidence for extending this effect to stylistic contexts, namely text type, for Ancient Egyptian clitic possessive variation. Gardiner (2015b) finds that, when comparing the rate of increase over time of \( p_i \) in letters to its rate of increase in official texts, the rates are the same. That is, while initial frequencies of \( p_i \) differed (letters was the first text type to introduce \( p_i \) possessives), the use of \( p_i \) possessives over time had the same rate of increase in both textual contexts – the slope of each logistic function was the same.

I use the same method here for modelling logistic curves of the \( p_i \) possessive, with some improvement. That is, I re-test the rate of \( p_i \)’s increase over time in various textual contexts, in order to show that clitic possession behaves as a typical change variable does, despite the change requiring over two millennia to reach completion (Kupreyev 2013; Egedi 2010; Loprieno 1995). However, where (Gardiner 2015b: 72) used only two text types and only 1239 tokens in total, I use my larger clitic possessive token set here – 2216 tokens – and three text types.

<table>
<thead>
<tr>
<th>Dynasty</th>
<th>( p_i ) Possessive</th>
<th>( pr.f ) Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>322</td>
<td>458</td>
<td>780</td>
</tr>
<tr>
<td>19</td>
<td>166</td>
<td>358</td>
<td>524</td>
</tr>
<tr>
<td>17-18</td>
<td>14</td>
<td>233</td>
<td>247</td>
</tr>
<tr>
<td>11-14</td>
<td>11</td>
<td>654</td>
<td>665</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Text Type</th>
<th>( p_i ) Possessive</th>
<th>( pr.f ) Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>letter</td>
<td>243</td>
<td>349</td>
<td>592</td>
</tr>
<tr>
<td>magical texts</td>
<td>16</td>
<td>781</td>
<td>797</td>
</tr>
<tr>
<td>fairy tale</td>
<td>254</td>
<td>573</td>
<td>827</td>
</tr>
<tr>
<td>Total</td>
<td>513</td>
<td>1703</td>
<td>2216</td>
</tr>
</tbody>
</table>

Table 4.1: Distributional results for clitic possessives for dynasty and text type.

First, consider the distributional results of each clitic possessive variant – the \( p_i \) possessive variant and the \( pr.f \) possessive variant – by dynasty and by text type, shown in Table 4.1. It appears from these distributions that clitic possessive variation is change over time, ands a series of two-tailed Fisher’s Exact tests show a statistically significant difference in distribution between each adjacent time period \((p < 0.01)\). It also seems from these distributions that magical texts have a much lower proportion of \( p_i \) possessives than the other text types do. I show that this latter effect (text type) does not matter in terms of the rate of change, and that the rate of increase of the \( p_i \) possessive will be the same no matter the text type.

First, consider the cross-tabulation of clitic possessive by text type over time, provided in Table 4.2.
Table 4.2: Cross-tabulation of clitic possessive tokens by time period in each text type.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>$p$ Possessive</th>
<th>$pr.f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynasty 11-14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>11</td>
<td>148</td>
<td>159</td>
</tr>
<tr>
<td>fairy tales</td>
<td>0</td>
<td>288</td>
<td>288</td>
</tr>
<tr>
<td>magical texts</td>
<td>0</td>
<td>218</td>
<td>218</td>
</tr>
<tr>
<td>Dynasty 17-18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>6</td>
<td>47</td>
<td>53</td>
</tr>
<tr>
<td>fairy tales</td>
<td>8</td>
<td>141</td>
<td>149</td>
</tr>
<tr>
<td>magical texts</td>
<td>0</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Dynasty 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>38</td>
<td>37</td>
<td>75</td>
</tr>
<tr>
<td>fairy tales</td>
<td>123</td>
<td>61</td>
<td>184</td>
</tr>
<tr>
<td>magical texts</td>
<td>5</td>
<td>260</td>
<td>265</td>
</tr>
<tr>
<td>Dynasty 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>188</td>
<td>117</td>
<td>305</td>
</tr>
<tr>
<td>magical texts</td>
<td>11</td>
<td>258</td>
<td>269</td>
</tr>
<tr>
<td>fairy tales</td>
<td>123</td>
<td>83</td>
<td>206</td>
</tr>
</tbody>
</table>

It is clear from the table that the $p$ possessive begins in letters, then spreads to fairy tales, and finally to magical texts. The details of the effect of text type over time will be discussed further with the other clitic possessive results below, while we focus for now on $p$’s rate of increase in each text type. Now that the raw numbers and percentages have provided a better indication that $p$ spreads through the three contexts over time, this is where we turn to the logistic function for modelling rate of change.

\[ y = \frac{1}{1+e^{-k-st}} \]  

The logistic function presented in (Zuraw 2003: 148), shown in (1), is the formula I use for my test, mapped using the statistical program Prism. In this equation, $y$ is the percentage of the new form (the $p$ possessive in this case). $t$ is time, which in this case will be the midpoint year of each period I use, while $k$ is the y-intercept (the initial frequency of the $p$ possessive. $s$, of course, is the value we are looking for: the slope of the function, or the rate of change. This is the value for which Prism solves once the other values are input into the program. Three logistic functions are used for this test: one to model the rate of increase of $p$ for each text type over time. That is, each curve represents the percentage of $p$ over time in one of the three text types: letters, fairy tales, and magical texts.

These three logistic curves are presented in Figure 4.1. Prism provides a confidence interval for each slope it has solved for, and it chooses the mean of this confidence interval as the slope it actually maps. These means are the slopes in Figure 4.1. It is evident from the graphs that the slopes are very close, if not outright the same; the slope for letters was 0.0075 for fairy tales 0.0085, and for magical texts 0.0081. To be sure that the slopes are not significantly different, they were compared via one-
Figure 4.1: Logistic curves modelling the rate of increase of $p$ possessives over time in each of the three text types. Slopes were compared via ANOVA; $F = 0.027$, $DF = 8$, $p = 0.97$.

way ANOVA (analysis of variance), conducted with Prism. The ANOVA tells us whether there is a significant difference between the means of three or more independent groups – in this case, the slopes of each of the three logistic curves. The results of the ANOVA indicate that the slopes (the means) are not significantly different from each other ($p = 0.97$). That is, the slopes are, statistically-speaking, the same across contexts – which means that the rate of increase of $p$ is also the same across text types.

In these logistic curves is also the statistical support needed for the Kupreyev (2013) claim that the $p$ possessive’s rapid increase begins during the Amarna Period. While the distributional results do indeed show a larger percentage of $p$ possessives in the later two Dynasties (19 and 20), post-Amarna (end of Dyn. 18), it is the logistic curves that provide the most striking evidence: it is indeed shortly after c. 1353-1336 BC (the Amarna Period) that the $p$ possessive begins the steep part of its S-curve in letters and fairy tales.

4.2 The Rise of $p$: Variation in Clitic Possession & Demonstratives

Having shown that the $p$ variant behaves in a way that is typical of any innovative variant in any language change situation, I have demonstrated that clitic possessive variation, which is marked by the
introduction of the \( p^1 \) possessive, is a suitable change variable to compare with stable variation. I now present the distributional and multivariate analyses of this variable, which will elucidate several findings.

First, these results allow me to observe which independent variables (factors) constrain clitic possession and how, in order to compare with nominal possession and determine whether they are different variables. Second, they allow me to map the trajectory of the spread of \( p^1 \) over time – something which has never been done before. In order to achieve this goal, I also include results from demonstrative variation, so as to show that demonstrative and possessive \( p^1 \) are related, and to obtain the full picture of the emergence and spread of \( p^1 \) in both variable contexts. Third, and relatedly, they allow me to compare the results for phrase complexity specifically in order to observe whether its effects differ from clitic possession to nominal possession, thus testing the Continuity Hypothesis.

### 4.2.1 Demonstratives: The Origins of \( p^1 \)

In order to understand the \( p^1 \) possessive – and thus understand clitic possessive variation in general – we must first consider the \( p^1 \) demonstrative. First attested c. 2345 BC (Dynasty 6, Old Kingdom) (Kupreyev 2013; Edel 1955), this demonstrative is the reason for the existence of \( p^1 \) possessives. Recall that in my syntactic analysis, I propose that the reason for the \( p^1 \) possessive is the reanalysis of \( p^1 \) demonstratives into Determiner head. Therefore, in order to understand the emergence of \( p^1 \) possessives, we must first understand demonstrative variation.

Since my syntactic account predicts that demonstrative \( p^1 \) and possessive \( p^1 \) are related structurally, I have tested the same factors (independent variables) on both demonstrative and clitic possessive variation. Initial distributional results are shown in Table 4.3.\(^1\) Script type was excluded because demonstrative tokens could only be obtained from hieratic texts.

Several things are evident from this table. First, it is clear that, as of the Middle Kingdom, there are many more \( p^1 \) demonstrative tokens than there are \( pn^1 \) demonstrative tokens – an indication that the change to \( p^1 \) is well underway in demonstratives by that time. Second, the texts of unknown location have only 3 tokens, all of which occur with the \( p^1 \) demonstrative. Likewise, magical texts have only five tokens, all of which occur with the \( pn^1 \) demonstratives. Given the small numbers of these sets and their categoricity, they are excluded from the logistic regression analyses. Third, and in a similar vein, demonstrative constructions with complexity scores of 2 or 3 have a categorical preference for the \( p^1 \) demonstrative. It is not useful to exclude such a high proportion of tokens (\( N = 47 \)) in such a small token set (\( N = 495 \)), so in the logistic regression analysis these sets are combined with the tokens that

---

\(^1\)I was not able to obtain demonstrative tokens from any Intermediate Periods; therefore all time periods are listed in terms of Kingdom. Recall that there were not enough tokens to measure by dynasty.

\(^2\)Recall that noun type divisions here are the same as those for possessum of clitic possession.
have a complexity score of 1.

Additionally, a cross-tabulation of time period and provenance reveals a problem with including
provenance as a factor group for demonstratives. As shown in 4.4,\(^3\) there are very few tokens from the Old Kingdom, most of which are from Upper Egypt South. Similarly, Lower Egypt has only two tokens in the Middle Kingdom while the tokens from the New Kingdom are only from Lower Egypt.

Due to this categoricity, neither time period nor provenance could be included in the logistic regression analysis, since these two groups cannot be separated for tokens from Lower Egypt – a substantial number of the dataset for demonstratives. However, while there is no significant difference in the distribution of tokens in Upper Egypt South over time, a two-tailed Fisher’s Exact Test shows a significant difference (p < 0.01) between the Lower Egyptian tokens from the Old Kingdom and the Lower Egyptian tokens from the New Kingdom. There is also a significant difference (p < 0.01) between the combination of Lower Egyptian tokens from the Old and Middle Kingdoms and the Lower Egyptian tokens from the New Kingdom. These data provide a small amount of statistical support for the claim that \(p\) demonstratives (very slowly) spread and replace \(pn\) demonstratives over time.

Additionally, using this same cross-tabulation, the trajectory of \(p\) in demonstratives can be pieced together – at least to some extent. During the Old Kingdom, what few tokens there are in Lower Egypt and Upper Egypt North occur only with \(pn\) demonstratives (these are adjacent locations in the northernmost and middle parts of Egypt). During that same period, Upper Egypt South sees more \(p\) demonstratives than \(pn\) demonstratives. While we cannot conclude this with certainty, it does suggest that the \(p\) demonstrative originated in Upper Egypt South, prior to the Old Kingdom – as by that time, it is already out-pacing \(pn\) in this area.

By the time of the Middle Kingdom, the \(p\) demonstrative has spread to Upper Egypt North and almost completely replaced the \(pn\) demonstrative, though the latter still holds out in Upper Egypt South, despite \(p\) having possibly originated there. While there are only 2 tokens from Lower Egypt during this period, both occur with the \(p\) demonstrative, indicating that it has spread to this location as well.

Finally, the New Kingdom has a similar pattern in Lower Egypt as that of the Middle Kingdom for Upper Egypt North: the \(p\) demonstrative has almost completely replaced the \(pn\) demonstrative. Since this trajectory cannot be shown using regression results, the conditional inference tree in Figure 4.2 provides a visual representation of this tentative account of the spread of \(p\) demonstratives over time: during the Old Kingdom \(p\) demonstratives exist only in Upper Egypt South, while the Middle and New Kingdoms see it spread to Upper Egypt North and Lower Egypt.

Due to these categorical distributions in time and space, the logistic regression analysis included only the linguistic factors noun type and complexity, as well as the social factor text type – a measure of register and the closest approximation we have to style for Ancient Egyptian. The results of this analysis

\(^{3}\)Magical text tokens and tokens of unknown provenance have already been excluded.
are shown in Table 4.5. The application value was the \(pn\) demonstrative, so higher factor weights and log odds indicate that this variant is favoured, while lower factor weights and log odds indicate that the \(ps\) demonstrative is favoured. Text type and complexity were significant; noun type was not.

The small range of factor weights for text type, hovering around 0.5, indicates that the effect of this factor group is weak, with a slight preference of fairy tales for the \(ps\) variant. This is not quite as predicted – it is odd that the most vernacular type, letters, slightly disfavours the innovative \(ps\) in favour of the more traditional \(pn\).

However, the cross-tabulation of text type and time period shown in Table 4.6 reveals that the only Old Kingdom tokens are letters – there are no demonstrative fairy tale tokens from earlier than the

Figure 4.2: Conditional inference tree visualizing the spread of \(ps\) demonstratives across Egypt over time. LE = Lower Egypt; UEN = Upper Egypt North; UES = Upper Egypt South. OK = Old Kingdom; MK = Middle Kingdom; NK = New Kingdom. \(ps\) demonstratives are represented by grey bars; \(pn\) demonstratives are represented by black bars.
Table 4.5: Significant factor groups for demonstratives. The $pn$ variant was the application value.

Table 4.6: Demonstrative tokens by time period for each text type.

Table 4.7: Variants by text type and time period.
time, just shifted by a Kingdom: fairy tales show a similar proportion of $p^i$ demonstratives in the New Kingdom as letters do in the Middle Kingdom. This is not surprising, given the Constant Rate Effects results seen for $p^i$ possessives: since the rate of the $p^i$ possessive’s increase is the same across text types despite different initial frequencies, we would naturally expect the rate of change to be similar across text types in $p^i$ demonstratives as well.

Complexity’s significance here is important as well, but it does not rule out the Continuity Hypothesis simply by virtue of affecting a change variable: it is evident from the factor weights that the results do not proceed in an orderly, continuous fashion in terms of variant preference – the same scenario that seen in the Becker (2014) and Hoffman and Walker (2010) studies discussed as part of the meta-analysis in Chapter 1. Here, the complexity score with the strongest preference for $pn$ is not -1, the lowest score, but 0, the middle score. Demonstratives without a noun, those that received a score of -1, show a slight preference for the innovative $p^j$ variant – the opposite of what is expected if this factor
group were constraining variant choice along a continuum. Additionally, it is important to remember
the near-categoricity of the 1+ complexity group: recall that this group includes scores of 1, 2, and 3,
where scores of 2 and 3 categorically occurred with the $p$ demonstrative. This indicates a categorical
specialization and/or a complete replacement $pn$ by $p$ in progress.

Finally, noun type’s non-significance here helps to separate $p$ demonstratives from $p$ possessives,
showing that while they are structurally related and have many constraints in common, and we need
$p$ demonstratives for $p$ possessives to exist, these two variables do not necessarily share all the same
constraints. In that vein, I move on to clitic possessive variation.

### 4.2.2 Clitic Possession: Language Change

Having already shown that clitic possessives behave as a typical change variable does, I show here that
my other predictions for clitic possession are generally supported by the data. I first present the overall
distributional results for clitic possessives, followed by the multivariate results and how these data inform
the predictions laid out in the previous chapter.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>$p$ Possessive</th>
<th>$pr,f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynasty 20</td>
<td>322</td>
<td>458</td>
<td>780</td>
</tr>
<tr>
<td>(c. 1189 BC - 1069 BC)</td>
<td>166</td>
<td>358</td>
<td>524</td>
</tr>
<tr>
<td>Dynasty 19</td>
<td>14</td>
<td>233</td>
<td>247</td>
</tr>
<tr>
<td>(c. 1292 BC - c. 1189 BC)</td>
<td>11</td>
<td>654</td>
<td>665</td>
</tr>
<tr>
<td>Dynasty 17-18</td>
<td>14</td>
<td>233</td>
<td>247</td>
</tr>
<tr>
<td>(c. 1580 BC - 1292 BC)</td>
<td>11</td>
<td>654</td>
<td>665</td>
</tr>
<tr>
<td>Dynasty 11-14</td>
<td>14</td>
<td>233</td>
<td>247</td>
</tr>
<tr>
<td>(c. 2134 BC - 1690 BC)</td>
<td>11</td>
<td>654</td>
<td>665</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provenance</th>
<th>$p$ Possessive</th>
<th>$pr,f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Egypt</td>
<td>144</td>
<td>140</td>
<td>284</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>113</td>
<td>213</td>
<td>326</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>242</td>
<td>1031</td>
<td>1273</td>
</tr>
<tr>
<td>Nubia/Unknown Provenance</td>
<td>14</td>
<td>319</td>
<td>333</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Script Type</th>
<th>$p$ Possessive</th>
<th>$pr,f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>hieratic</td>
<td>511</td>
<td>1485</td>
<td>1996</td>
</tr>
<tr>
<td>hieroglyphic</td>
<td>2</td>
<td>218</td>
<td>220</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Text Type</th>
<th>$p$ Possessive</th>
<th>$pr,f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>letter</td>
<td>243</td>
<td>349</td>
<td>592</td>
</tr>
<tr>
<td>magical texts</td>
<td>16</td>
<td>781</td>
<td>797</td>
</tr>
<tr>
<td>fairy tale</td>
<td>254</td>
<td>573</td>
<td>827</td>
</tr>
</tbody>
</table>

| Total                        | 513            | 1703              | 2216  |

Table 4.7: Distributional results for clitic possessives by social factor group (independent social variable).

The overall distributional results for clitic possession are shown in Table 4.7 and Table 4.8 for social
factors and linguistic factors, respectively. These tables make evident several things: first, high-status
Table 4.8: Distributional results for clitic possessives by linguistic factor group (independent linguistic variable).

Possessum Category | $p^1$ Possessive | $pr.f$ Possessive | Total  
---|---|---|---
animate/official     | 301 50% | 298 50% | 599  
high-status          | 22 2%   | 960 98% | 982  
other                | 190 30% | 445 70% | 635  

Possessor Category  | $p^1$ Possessive | $pr.f$ Possessive | Total  
1SG                   | 124 28% | 313 72% | 437  
2FSG                  | 9 16%   | 46 84%  | 55   
2MSG                  | 111 23% | 370 77% | 481  
3FSG                  | 36 22%  | 128 78% | 164  
3MSG                  | 174 19% | 719 81% | 893  
1PL                    | 7 33%   | 14 67%  | 21   
2PL                    | 11 30%  | 26 70%  | 37   
3PL                    | 41 32%  | 87 68%  | 128  

Complexity | $p^1$ Possessive | $pr.f$ Possessive | Total  
0          | 431 21% | 1661 79% | 2092 
1          | 78 66%  | 41 34%  | 119  
2          | 4 80%   | 1 20%   | 5    

Total       | 513 23% | 1703 77% | 2216 

possessa occur quite often with the $pr.f$ possessive, but almost never (22/982 tokens) with the $p^1$ possessive.

Second, complexity does not go higher than 2, with the vast majority of tokens occurring at the 0 complexity level, some occurring at 1 complexity, while almost none occur at 2 complexity. For the logistic regression analysis, therefore, scores of 1 and 2 complexity were combined together into the new category, 1+.

Third, the increase of $p^1$ possessives over time, previously illustrated by the logistic curve in Figure 4.1, is corroborated again by the distributional results shown previously (see Table 4.1) and repeated here: the proportion of $p^1$ tokens increases as we move forward in time (upward in dynasty). There also appear to be some location differences: Upper Egypt South seems to have a much higher rate of $pr.f$ than anywhere else. These are both as predicted for this variable. However, if the dialect hypothesis for $p^1$ is correct, we would expect to see not just separate effects of provenance and time, but an interaction of provenance and time. In this scenario, the $p^1$ possessive emerges in one location, and spreads over time across Egypt. This means that the Nubian/unknown tokens must be excluded from the logistic regression analysis: the Nubian tokens are too few to include on their own in a logistic regression analysis ($N < 15$), and we cannot include tokens whose provenance is unknown as this would confound the interaction factor group. Therefore, these 333 tokens were removed for the purposes of the logistic regression. This brings the total number of clitic possessive tokens down to 1883. Additionally, tokens from Dynasty 19
were merged with tokens from Dynasties 20 to form a larger, Post-Amarna New Kingdom. This division still allows for testing Kupreyev’s (2013) claim that the $p$ possessive becomes prolific after the Amarna Period, at the end of Dynasty 18.

<table>
<thead>
<tr>
<th>Dynasties 11-14</th>
<th>$p$ Possessive</th>
<th>$pr.f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Egypt</td>
<td>0 0%</td>
<td>13 100%</td>
<td>13</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>9 5%</td>
<td>184 95%</td>
<td>193</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>1 0%</td>
<td>410 100%</td>
<td>411</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dynasties 17-18</th>
<th>$p$ Possessive</th>
<th>$pr.f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Egypt</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>3 25%</td>
<td>9 75%</td>
<td>12</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>8 4%</td>
<td>210 96%</td>
<td>218</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dynasty 19-20</th>
<th>$p$ Possessive</th>
<th>$pr.f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Egypt</td>
<td>144 53%</td>
<td>127 47%</td>
<td>271</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>101 83%</td>
<td>20 17%</td>
<td>121</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>233 26%</td>
<td>411 64%</td>
<td>644</td>
</tr>
</tbody>
</table>

Table 4.9: Cross-tabulation of clitic possessive tokens by time period in each location.

The cross-tabulation of provenance and time, shown in Table 4.9 gives us an indication that there will be an interaction of provenance and dynasty: During the Middle Kingdom (Dynasties 11-14) there are almost no $p$ tokens, but more of them occur in Upper Egypt North than anywhere else. Similarly, Upper Egypt North has a higher proportion of $p$ tokens than the other two locations in all three periods shown.

Mapping the Spread of $p$ Possessives

Having established which exclusions and combinations of factors within groups were necessary for analysis, I now present the results of the logistic regression analysis. These are shown in Table 4.10. The application value was the $pr.f$ possessive, so higher log odds and factor weights mean that this variant is favoured, while lower log odds and factor weights mean that the $p$ possessive is favoured. Possessor category was not significant, but all other factor groups were. Script type could not be included as a factor group in the regression analysis: upon the removal of tokens of unknown provenance, the distribution of clitic possesives in hieroglyphic texts was entirely categorical in favour of the $pr.f$. This is most likely due to the fact that the majority ($129/199$ – 64%) of the very few hieroglyphic tokens in the dataset were from magical texts of the Middle Kingdom, while an additional 23% ($46/199$) of hieroglyphic tokens were from magical texts of a later time period, making it impossible to separate the potential effects of this factor group from those of time period and text type. Since the removal of the hieroglyphic tokens yielded the same results for the other factor groups (including text type and time period) in terms of significance and effect size, hieroglyphic tokens were included in the dataset in order
to maintain a larger sample size. Note also that tokens from Lower Egypt in the Middle Kingdom are coded as "/" due to their categoricity: they occur only with pr.f possessives. Coding a "/" instructs Rbrul’s logistic regression to include these tokens' information for other factor groups while excluding them for the Provenance*Dynasty interaction factor group. This prevents having to exclude more tokens from the analysis. Likewise, tokens from Upper Egypt south during the Middle Kingdom were almost categorical – only one pr token was found there – so these were coded as "/" as well. No tokens were obtained from Lower Egypt for Dynasties 17-18.

<table>
<thead>
<tr>
<th>Provenance*Dynasty</th>
<th>p Possessive</th>
<th>pr.f Possessive</th>
<th>Log Odds</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Egypt South Dyn. 11-14</td>
<td>1</td>
<td>410</td>
<td>100%</td>
<td>N/A</td>
</tr>
<tr>
<td>Lower Egypt Dyn. 11-14</td>
<td>0</td>
<td>13</td>
<td>100%</td>
<td>N/A</td>
</tr>
<tr>
<td>Lower Egypt Dyn. 17-18</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>N/A</td>
</tr>
<tr>
<td>Upper Egypt South - Dyn. 17-18</td>
<td>8</td>
<td>210</td>
<td>96%</td>
<td>2.59</td>
</tr>
<tr>
<td>Upper Egypt North - Dyn. 11-14</td>
<td>9</td>
<td>184</td>
<td>95%</td>
<td>1.49</td>
</tr>
<tr>
<td>Upper Egypt North - Dyn. 17-18</td>
<td>3</td>
<td>9</td>
<td>75%</td>
<td>1.40</td>
</tr>
<tr>
<td>Upper Egypt South - Dyn. 19-20</td>
<td>233</td>
<td>411</td>
<td>64%</td>
<td>-1.27</td>
</tr>
<tr>
<td>Lower Egypt - Dyn. 19-20</td>
<td>144</td>
<td>127</td>
<td>47%</td>
<td>-1.65</td>
</tr>
<tr>
<td>Upper Egypt North - Dyn. 19-20</td>
<td>101</td>
<td>20</td>
<td>16%</td>
<td>-2.57</td>
</tr>
<tr>
<td>Text Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>magical texts</td>
<td>12</td>
<td>505</td>
<td>98%</td>
<td>2.27</td>
</tr>
<tr>
<td>letters</td>
<td>233</td>
<td>306</td>
<td>57%</td>
<td>-1.05</td>
</tr>
<tr>
<td>fairy tales</td>
<td>254</td>
<td>573</td>
<td>69%</td>
<td>-1.22</td>
</tr>
<tr>
<td>Complexity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>418</td>
<td>1346</td>
<td>76%</td>
<td>0.47</td>
</tr>
<tr>
<td>1+</td>
<td>81</td>
<td>38</td>
<td>32%</td>
<td>-0.47</td>
</tr>
<tr>
<td>Possessum Category</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>high-status</td>
<td>22</td>
<td>761</td>
<td>97%</td>
<td>2.48</td>
</tr>
<tr>
<td>other</td>
<td>185</td>
<td>369</td>
<td>67%</td>
<td>-0.58</td>
</tr>
<tr>
<td>animate/official</td>
<td>292</td>
<td>254</td>
<td>46%</td>
<td>-1.91</td>
</tr>
<tr>
<td>Total</td>
<td>499</td>
<td>1384</td>
<td>74%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.10: Significant factor groups for clitic possessives. The pr.f variant was the application value.

The first piece of information provided by results is that only about 1/4 of the tokens overall are p1 possessive tokens. The 1/4 p1 distribution makes sense when we look at the provenance + dynasty interaction factor group: the Middle Kingdom ( Dynasties 11-14) sees almost no p1 possessive tokens, indicating this period is the very beginning of the change towards p1 possessives. This is in contrast to the demonstrative data: by the time of the Middle Kingdom, p1 demonstratives already comprise about 1/4 of the data (see Table 4.3).

Second, the effects of provenance over time are very clear and very strong, with factor weights ranging form 0.07 to 0.93. In line with the distributional results in Table 4.7 and the cross-tabulation in Table 4.9, p1 increases in use over time, from Dynasty 11 through Dynasty 20. This change begins in Upper Egypt North, which consistently has higher proportions of the p1 possessive throughout the periods.
investigated. Lower Egypt accepts the innovative $p^i$ possessive post-Amarna (Dyn. 19-20), while Upper Egypt South retains the most $pr.f$ in each time period – though its proportion of $p^i$ does increase over time as well. These patterns are elucidated further by the conditional inference tree in Figure 4.4, which depicts variant choice as a result of the combination of dynasty and provenance. The fact that this final spread occurs post-Amarna supported the claim that this period spurred the rapid increase in use of $p^i$ possessives.

The results in Table 4.10 also indicate that text type was significant: magical texts strongly favour the $pr.f$ possessive, while letters strongly favour the innovative $p^i$ possessive. This is what would be expected if style were a continuous factor. However, a surprising finding throws this idea of a style continuum for a loop: fairly tales also strongly favour the $p^i$ possessive, despite being a less vernacular text type than letters. This effect is not the result of an interaction with possessum type, complexity, time period, or provenance.
Having such a strong effect of text type also allows for comparison to possessive and demonstrative pronouns: do both possessive and demonstrative pronouns originate in the same context? We already know that they do not originate at the same time: data from demonstratives show that pronouns already comprise 25% of the total data by the time possessives emerge in the Middle Kingdom (Dyn. 11-14). We also know from the demonstrative results that pronouns appear to originate in Upper Egypt South, in letters.

However, the cross-tabulation of dynasty and provenance for possessives (Table 4.9) indicates that possessives originate in Upper Egypt North, not Upper Egypt South. In support of this, the conditional inference tree in figure 4.5 provides a visualization of the number of possessives by provenance.
and text type: Upper Egypt North has the highest numbers of $p^i$ possessive, in fairy tales specifically.

<table>
<thead>
<tr>
<th></th>
<th>$p^i$ Possessive</th>
<th>$pr.f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dynasty 11-14</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>10</td>
<td>127</td>
<td>137</td>
</tr>
<tr>
<td>fairy tales</td>
<td>0</td>
<td>288</td>
<td>288</td>
</tr>
<tr>
<td>magical texts</td>
<td>0</td>
<td>192</td>
<td>192</td>
</tr>
<tr>
<td><strong>Dynasty 17-18</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>3</td>
<td>33</td>
<td>36</td>
</tr>
<tr>
<td>fairy tales</td>
<td>8</td>
<td>141</td>
<td>149</td>
</tr>
<tr>
<td>magical texts</td>
<td>0</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td><strong>Dynasty 19-20</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>220</td>
<td>146</td>
<td>366</td>
</tr>
<tr>
<td>fairy tales</td>
<td>246</td>
<td>144</td>
<td>390</td>
</tr>
<tr>
<td>magical texts</td>
<td>12</td>
<td>268</td>
<td>280</td>
</tr>
</tbody>
</table>

Table 4.11: Cross-tabulation of clitic possessive tokens by time period in each text type – excluding tokens of unknown provenance, and combining Dynasties 19-20.

This appears to differ from the origins of $p^i$ demonstratives. However, consider the cross-tabulation of text type and time period, found earlier in Table 4.2, and shown here in Table 4.11 with the tokens of unknown provenance excluded and Dyn. 19-20 combined. This table makes it clear that the earliest instances of $p^i$ possessives – the ones from Upper Egypt North during the Middle Kingdom (Dyn. 11-14), as shown by Table 4.11 – do in fact come from letters, the same context where $p^i$ demonstratives began in the Old Kingdom. Additionally, $p^i$ possessives originate during the Middle Kingdom, later than $p^i$ demonstratives. Therefore we must consider what $p^i$ demonstratives were doing in the Middle Kingdom rather than at their time of origin during the Old Kingdom.

The Middle Kingdom for demonstratives in fairy tales appears to be the equivalent of the Old Kingdom for demonstratives in letters, where $p^i$ demonstratives occur about 64% of the time in both of these cases (see Table 4.6). That is, during the Middle Kingdom we see the same rates of $p^i$ demonstratives in fairy tales as we saw in letters in the preceding time period (the Old Kingdom). Additionally, in the New Kingdom there is a slightly higher percentage of $p^i$ demonstratives for fairy tales (97%) than in the letters of the Middle Kingdom (89%) (see Table 4.6), suggesting that even though the rates are similar when shifted by a kingdom, fairy tales do have a somewhat stronger preference for $p^i$ demonstratives, also evidenced by the factor weights in the logistic regression – see Table 4.5. This is illustrated in Figure 4.3.

As for Upper Egypt North birthing and favouring the $p^i$ possessive while Upper Egypt South appears to be the point of origin for the $p^i$ demonstrative? This can be accounted for by several facts. First, we have only one demonstrative token from Upper Egypt North during the Old Kingdom, so we cannot be sure its use of $p^i$ was not higher than in Upper Egypt South – indeed, the single Upper Egypt North
token is a $p^i$ demonstrative. Second, the demonstrative data indicate that in the two later periods (the Middle and New Kingdoms) Upper Egypt North and Lower Egypt both have higher percentages of $p^i$ than does Upper Egypt South. That is, when the $p^i$ possessive emerges it is favoured in the physical context (the location) where the $p^i$ demonstrative has become prolific, Upper Egypt North – not where it originated, in Upper Egypt South. This is similar to the pattern for text type: the $p^i$ possessive is favoured in fairy tales, where the $p^i$ demonstrative had begun to become prevalent at the time when the $p^i$ possessive emerged, rather than in letters where both $p^i$ demonstrative and $p^i$ possessive were first spotted.

**Alienability & Animacy**

Possessum category also has a strong effect on clitic possessive variation: its factor weights range from 0.14 for the animate/official category to 0.92 for the high-status category.

First, recall that in Chapter 3, these categories created for clitic possessives differed from the way in which this same factor group could be collapsed for nominal possessives – an indication that these two types of possession are not the same variable existing in parallel, as Kammerzell (2000) suggests. However, the distribution of the factors within this group is partially in line with the other Kammerzell (2000) claim: some typically “inalienable” nouns like body parts and names can be placed into the high-status category based on similar distributions to other high-status possessa (as discussed in the previous chapter), and this category favours the $pr.f$ variant. However, the alienability claim falls apart for some of the other nouns: family members had to be placed into the animate/official category due to their distribution being more similar to these nouns that to the high-status nouns. This category, including family member possessa, favours the innovative $p$ variant. Conversely, gods and royalty – more likely to be alienable than one’s family members – were in the high-status, $pr.f$-favouring category.

These results also do not support an animacy hierarchy: recall that high-status possessa also include inanimate objects like crowns as well as animate entities like gods and royalty, all of which favour the $pr.f$ possessive – while the other animate possessa, like family members, favour the $p^i$ possessive.

This effect is made even more interesting when observed in concert with the effect of text type. The cross-tabulation in Table 4.12, visualized by the conditional inference tree in Figure 4.6, reveals that there are more high-status possessa in magical texts and fairy tales than in letters (N = 131). Knowing that high-status possessa favour the $pr.f$ possessive, it is all the more striking that fairy tales so strongly favour the $p^i$ possessive. This tree also makes evident the vernacularizing effect of letters: no matter the word type, letters consistently have more of the stigmatized $p^i$ possessive than do magical texts. It is also clear from this tree that each of these two effects – possessum category and text type – stands on
Chapter 4. Results

<table>
<thead>
<tr>
<th></th>
<th>$p^i$ Possessive</th>
<th>$pr.f$ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>high-status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>13 10%</td>
<td>118 90%</td>
<td>131</td>
</tr>
<tr>
<td>fairy tales</td>
<td>7 2%</td>
<td>327 98%</td>
<td>334</td>
</tr>
<tr>
<td>magical texts</td>
<td>2 1%</td>
<td>316 99%</td>
<td>318</td>
</tr>
<tr>
<td><strong>animate/official</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>139 67%</td>
<td>70 33%</td>
<td>209</td>
</tr>
<tr>
<td>fairy tales</td>
<td>148 60%</td>
<td>97 40%</td>
<td>245</td>
</tr>
<tr>
<td>magical texts</td>
<td>5 5%</td>
<td>87 95%</td>
<td>92</td>
</tr>
<tr>
<td><strong>other</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>letters</td>
<td>81 41%</td>
<td>118 59%</td>
<td>199</td>
</tr>
<tr>
<td>fairy tales</td>
<td>99 40%</td>
<td>149 60%</td>
<td>248</td>
</tr>
<tr>
<td>magical texts</td>
<td>5 5%</td>
<td>102 95%</td>
<td>107</td>
</tr>
</tbody>
</table>

Table 4.12: Cross-tabulation of clitic possessive tokens by possessum category in each text type.

its own as well.

Complexity & The Continuity Hypothesis

Complexity is also significant, which was not predicted. However, this is in line with the demonstrative results, which also have complexity as a significant factor. And like the demonstrative results, though not quite the same, it is clear from Table 4.10 that complexity does not constrain clitic possessives along an obvious continuum the way we will see in nominal possessives. In clitic possessives, we never see a complexity score of more than 2 – while in nominal possessives, this score goes as high as 12. Furthermore, instead of a continuous scale, a binary split is evident: a complexity score of 0 favours the $pr.f$ possessive while a score of 1 or 2 strongly favours the $p^i$ possessive. It is also noteworthy that there is a much greater number of clitic possessives with a score of 0 than with a score of 1 or 2. This is further illustrated by Figure 4.7, which makes clear the dramatic drop in number of clitic possessives at all once complexity scores become higher than 0. This graph also shows the striking preference for the $p^i$ possessive in tokens with scores higher than 0. Complexity will also be discussed in more detail as compared to nominal possessive variation, in the section below.

4.3 Nominal Possession: Stable Variation

I begin my analysis of nominal possessives with an effect of $p^i$ demonstratives: my syntactic account predicts that towards the end of the investigated time period, pre-nominal Determiner analysis of $p^i$ should out-compete the pre-nominal Demonstrative analysis of $p^i$. This means that $s^i \ r^c$ and $pr.f$ possessives with pre-nominal demonstratives will cease to be possible, as all instances of $p^i$ will be in D (where the possessum is located in $s^i \ r^c$ and $pr.f$). And indeed, the data reveal that this is so: while
Figure 4.6: Conditional inference tree visualizing the percentage of $p^3$ possessives by text type and possessum category. $p^3$ possessives are represented by grey bars; $pr.f$ possessives are represented by black bars.

very few $s^r$ possessives did occur with pre-nominal demonstratives ($N < 10$), the only ones that do appear prior to Dynasty 20.

Now, while clitic possessive variation is a clear (if slow) instance of language change, with the $p^3$ possessive replacing the $pr.f$ possessive over time, nominal possessive variation is a rather different story. First, the distributional results of possessive type – *nisbe* vs $s^r$ – are illustrated in Table 4.13 for social factors and Table 4.14 for linguistic factors, respectively.

Some trends are already visible from these tables. First, we can see that the split of nominal possessives by dynasty seems to be relatively stable over time, with much less striking differences in distribution than was seen for clitic possessives.
Second, complexity looks very different here than it did for clitic possessives. In this case, complexity scores go up to 5 before we start to see any categoricity, whereas for clitic possessives there were no tokens with a score higher than 2, with most tokens occurring at 0 complexity, a small number at 1, and a very tiny amount at 2. While there is a similar trend here for nominal possessives – the higher the complexity, the fewer tokens overall – the drop is much more gradual, and ₃ ᵣ possessives appear to hold their own relatively well against nisbe possessives, unlike the pr.f possessive which almost exclusively occur with a complexity score of 0 (see Tables 4.8 and 4.10).

Another thing to consider for nominal possessives is their structure: since they are composed of two nouns rather than a noun and a pronominal element the way clitic possessives are, it is necessary to include a cross-tabulation of possessum and possessor category – especially since noun type has such a strong effect both in the genitive literature and in Egyptological treatments of possessives. This factor is often thought of only as the possessed noun, but the cross-tabulation in Table 4.15 indicates that certain combinations of possessum and possessor have different effects. Therefore, for the logistic
regression analysis, I have combined these into a interaction factor group of possessum and possessor category. However, the combination of animate possessa with family possessors yielded only 5 tokens, categorically of the nisbe possessive, so it was excluded from the regression analysis.

The results of the logistic regression analysis are shown in Table 4.16. The application value was the s\(\text{r}^c\) possessive, so higher factor weights and log odds mean that this possessive is favoured, while lower factor weights and log odds mean that the nisbe possessive is favoured. As there was no interaction with provenance to consider here, tokens of unknown provenance could be coded as / so that the information for these tokens from other factor groups could be included in the analysis. Non-significant factors were dynasty and script type.

### 4.3.1 Measuring Stability

The first observation we can make based on Table 4.16 comes not from the factor groups that are in the table, but from a factor group that is not there: dynasty was not significant. This quite different from clitic possessive variation, where dynasty is one of the strongest predictors of variant choice. Its significance, strength, and constraint order there were indicators that clitic possession is change over time. Here, its lack of significance is the first indicator that nominal possession is stable over time. The

### Table 4.13: Distributional results for nominal possessives by social factor (independent social variable).

<table>
<thead>
<tr>
<th>Dynasty</th>
<th>nisbe Possessive</th>
<th>s(\text{r}^c) Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 (c. 1189 BC - c.1069 BC)</td>
<td>490 47%</td>
<td>552 53%</td>
<td>1042</td>
</tr>
<tr>
<td>19 (c. 1292 BC - c. 1189 BC)</td>
<td>238 52%</td>
<td>217 48%</td>
<td>455</td>
</tr>
<tr>
<td>17-18 (c. 1580 BC - c. 1292 BC)</td>
<td>147 48%</td>
<td>158 52%</td>
<td>305</td>
</tr>
<tr>
<td>17-18 (c. 2134 BC - c. 1690 BC)</td>
<td>273 43%</td>
<td>365 57%</td>
<td>638</td>
</tr>
<tr>
<td>Provenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Egypt</td>
<td>114 53%</td>
<td>103 47%</td>
<td>217</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>211 39%</td>
<td>335 61%</td>
<td>546</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>701 49%</td>
<td>726 51%</td>
<td>1427</td>
</tr>
<tr>
<td>unknown provenance</td>
<td>122 49%</td>
<td>128 51%</td>
<td>250</td>
</tr>
<tr>
<td>Script Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hieratic</td>
<td>1074 48%</td>
<td>1177 52%</td>
<td>2251</td>
</tr>
<tr>
<td>hieroglyphic</td>
<td>74 39%</td>
<td>115 61%</td>
<td>189</td>
</tr>
<tr>
<td>Text Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>magical texts</td>
<td>327 49%</td>
<td>335 51%</td>
<td>662</td>
</tr>
<tr>
<td>letters</td>
<td>453 41%</td>
<td>658 59%</td>
<td>1111</td>
</tr>
<tr>
<td>fairy tales</td>
<td>368 55%</td>
<td>299 45%</td>
<td>667</td>
</tr>
<tr>
<td>Total</td>
<td>1148 47%</td>
<td>1292 53%</td>
<td>2440</td>
</tr>
</tbody>
</table>
Table 4.14: Distributional results for nominal possessives by linguistic factor group (independent linguistic variable).

Table 4.15: Cross-tabulation of nominal possessives by possessum category for each possessor category.

distribution of each variant over time – presented first in Table 4.13 – is now presented again on its own in Table 4.17. It is evident from these results that there is almost a 50/50 split for both possessives in
Chapter 4. Results

Table 4.16: Significant factor groups for nominal possessives. The $s^r$ possessive was the application value.

<table>
<thead>
<tr>
<th>Provenance + Dynasty</th>
<th>nisbe Possessive</th>
<th>$s^r$ Possessive</th>
<th>Log Odds</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Egypt North</td>
<td>211</td>
<td>335</td>
<td>0.14</td>
<td>0.54</td>
</tr>
<tr>
<td>Lower Egypt</td>
<td>114</td>
<td>103</td>
<td>0.00</td>
<td>0.5</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>701</td>
<td>726</td>
<td>-0.15</td>
<td>0.46</td>
</tr>
<tr>
<td>unknown</td>
<td>122</td>
<td>128</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Text Type</th>
<th>$s^r$ Possessive</th>
<th>Log Odds</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>magical texts</td>
<td>327</td>
<td>0.21</td>
<td>0.55</td>
</tr>
<tr>
<td>letters</td>
<td>453</td>
<td>0.10</td>
<td>0.53</td>
</tr>
<tr>
<td>fairy tales</td>
<td>368</td>
<td>-0.31</td>
<td>0.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possessum Category x Possessor Category</th>
<th>$s^r$ Possessive</th>
<th>Log Odds</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>high-status x high-status</td>
<td>124</td>
<td>1.93</td>
<td>0.87</td>
</tr>
<tr>
<td>high-status x other</td>
<td>126</td>
<td>1.22</td>
<td>0.77</td>
</tr>
<tr>
<td>other x high-status</td>
<td>181</td>
<td>0.60</td>
<td>0.65</td>
</tr>
<tr>
<td>other x other</td>
<td>311</td>
<td>0.03</td>
<td>0.51</td>
</tr>
<tr>
<td>body x high-status</td>
<td>95</td>
<td>-0.09</td>
<td>0.48</td>
</tr>
<tr>
<td>body x other</td>
<td>121</td>
<td>-0.27</td>
<td>0.43</td>
</tr>
<tr>
<td>animate x other</td>
<td>9</td>
<td>-0.50</td>
<td>0.38</td>
</tr>
<tr>
<td>body x family</td>
<td>11</td>
<td>-0.69</td>
<td>0.33</td>
</tr>
<tr>
<td>other x family</td>
<td>22</td>
<td>-0.99</td>
<td>0.27</td>
</tr>
<tr>
<td>high status x family</td>
<td>22</td>
<td>-1.01</td>
<td>0.27</td>
</tr>
<tr>
<td>animate x family</td>
<td>5</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complexity</th>
<th>$s^r$ Possessive</th>
<th>Log Odds</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>continuous + 1</td>
<td></td>
<td>-0.45</td>
<td></td>
</tr>
</tbody>
</table>

| Total                      | 1145             | 47%      | 1292   | 53%    |

Table 4.17: Nominal possessives by dynasty.

There are three possible accounts for this difference. First, this could be the result of natural variation – and indeed, a series of Fisher’s Exact Tests shows no statistically significant difference between any adjacent time periods. That is, this earliest time period (Dyn. 11-14) is not significantly different from the distribution of possessives in the time period that follows it (Dyn. 17-18). Likewise, the distribution in Dyn. 17-18 is not significantly different from the distribution in Dyn. 19, which is itself not significantly
different from Dyn. 20.

However, there is a statistically significant difference between Dyn. 11-14 and Dyn. 19, and between Dyn. 11-14 and Dyn. 20. There are no other significant differences in non-adjacent periods – i.e. Dyn. 20 is not different from Dyn. 17-18 – so the main difference is Dyn. 11-14 from the latest two Dynasties. This difference could indicate an incredibly slow change over time, so slow as not to be detectable by the logistic regression model. However, if it were true that nominal possessives did change in favour of nisbe possession, this would still be a suitable variable to compare with clitic possession, and it would still be suitable for testing the Continuity Hypothesis and addressing our understanding of stable variation. This is because, according to Wallenberg (2013) and Fruehwald and Wallenberg (2013), no variation is ever truly stable. The idea behind their Competing Grammars theory of variation is that specialization of any kind – continuous/ordinal or categorical – removes the competition. A continuous factor group will do this while keeping the variation stochastic: recall that with a continuous factor, there is no single environment where one variant is favoured, but rather an increase in that variant’s likelihood of occurred as we move farther along the continuum in one direction (Wallenberg 2013; Fruehwald and Wallenberg 2013). A consequence of this theory is that the continuous factor group does not remove all the competition – it only slows the change dramatically. In other words, no variation is stable forever. Therefore, we can only measure degrees of stability, which means comparing the already slow change in clitic possessives to the apparently even slower change in nominal possessives is a valid comparison: “stability” is only in how it compares to other, faster changes. Additionally, it is also possible that nominal possessives become categorically specialized at later time periods – Coptic, for example – meaning that the competition and the variation are gone, but the change stops as well before full replacement occurs.

That said, it is quite likely that this particular difference in distribution is simply due to an effect of provenance. Similar to clitic possessives, nominal possessives appear to be somewhat of a dialect feature as well, shown in Table 4.16. Nominal possessives do not run in parallel to clitic possessives, however: while in clitic possession it is Upper Egypt North which favours the incoming pr. possessive over the old pr.f possessive, this same region slightly favours the s r possessive – structurally equivalent and compared by Egyptologists (Allen 2010; Kammerzell 2000; Hoch 1997; Gardiner 1957) to the pr.f, not the p. In similar contrast, Upper Egypt South has the most resistance to the p possessive in clitic possession, while favouring the nisbe nominal possessive, which was thought to run in parallel with the p clitic possessive (Kammerzell 2000). Knowing this, the cross-tabulation in Table 4.18 reveals that the troublesome Middle Kingdom (Dyn. 11-14) period has more tokens from Upper Egypt North in terms of both actual number and proportion than any other period, shifting its preference in favour of the s.
Chapter 4. Results

141

The cross-tab also shows that this location always has a slight preference for the s√r√ possessive regardless of time period, so we can reasonably conclude that this is what is causing the Dyn. 11-14 difference, rather than the other way around. This cross-tabulation also makes it clear that, unlike in clitic possession, there is no clear spread of either variant across any location over time. That is, this variable is stable.

<table>
<thead>
<tr>
<th>Dynasties 11-14</th>
<th>nisbe Possessive</th>
<th>s√r√ Possessive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Egypt</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>110</td>
<td>221</td>
<td>331</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>141</td>
<td>117</td>
<td>258</td>
</tr>
<tr>
<td>Dynasties 17-18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Egypt</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>10</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>130</td>
<td>133</td>
<td>263</td>
</tr>
<tr>
<td>Dynasty 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Egypt</td>
<td>87</td>
<td>85</td>
<td>172</td>
</tr>
<tr>
<td>Upper North</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>68</td>
<td>49</td>
<td>117</td>
</tr>
<tr>
<td>Dynasty 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Egypt</td>
<td>26</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Upper Egypt North</td>
<td>90</td>
<td>99</td>
<td>189</td>
</tr>
<tr>
<td>Upper Egypt South</td>
<td>362</td>
<td>427</td>
<td>789</td>
</tr>
</tbody>
</table>

Table 4.18: Cross-tabulation of nominal possessives by dynasty in each location. Tokens of unknown geographic origin are not included (N = 247).

4.3.2 Noun Type and Text Type

The interaction factor group of possessum and possessor category – henceforth noun type – has the strongest effect on nominal possession (shown in Table 4.16), with a range of factor weights from 0.27 in favour of the nisbe to 0.87 in favour of the s√r√ possessive. This is not surprising given the information gleaned from Dhutmose’s letters, Egyptological claims, and the effects of noun type on English and Arabic possessive variation. The combination of high-status possessum and high-status possessor yields the strongest preference for the s√r√ possessive, followed by the two combinations of high-status nouns with the “other” nouns. However, family possessors and body possessa fall in the other direction, favouring the nisbe possessive. This finding is contra both the animacy and alienability predictions. In these results, animate royal and animate godly nouns favour the s√r√ possessive while (animate) family members opposingly favour the nisbe possessive. Included in the high-status and other categories are inanimate nouns as well as animate ones, and yet these and other inanimate nouns fall in the middle of the hierarchy rather than at either end of it. Meanwhile, the nouns with the most potential to be inalienable, and
therefore to prefer the *s*<sup>3</sup> *r*<sup>1</sup> possessive (Kammerzell 2000) – body parts and family members (Kammerzell 2000; Nichols and Bickel 2011; Nichols 1988) – favour the *nisbe* possessive. In contrast, nouns considered to be alienable – royal objects, godly objects, royal people, and gods themselves – are the ones which have the strongest preference for the *s*<sup>3</sup> *r*<sup>1</sup> possessive, which was purported to indicate inalienable possession (Egedi 2010; Kammerzell 2000).

The effect of text type is weak, but present: Table 4.16 shows that fairy tales stand out again, favouring the *nisbe* (with a factor weight of 0.42) while the other text types have a slight preference for the *s*<sup>3</sup> *r*<sup>1</sup> possessive. It is also important to note here that it is not behaving continuously – letters, being the most vernacular, should be at one end of the continuum with magical texts at the other. Here, letters are in the middle, and are closer to magical texts than to fairy tales, with fairy tales preferring the variant that high-status noun combinations do not – the opposite of what is expected of a formal style.
In a similar vein, the effect of text type is at its most interesting when observed in combination with
the effect of noun type, represented visually by the conditional inference tree in Figure 4.8. This tree
shows that text type really only makes a difference in some cases: tales mean more nisbe possessives,
but only for the high-status + high-status combination (N = 170 in fairy tales), and the combination
of “other” type possessa with family and other possessors (N = 190 in fairy tales). The remaining
combinations appear to be immune to text type effect.

4.3.3 The Continuity Hypothesis: Comparing Phrase Complexity

Finally, we come to the effect of complexity, and the testing of the Continuity Hypothesis. Complexity
is significant in increments of 1 (i.e. one additional element, as defined in the syntactic analysis), with
negative log odds. This indicates that as the complexity score of a possessive construction increases
by one point (i.e. one additional modifying element), that possessive construction becomes less and
less likely to occur with the s' r- possessive. This result supports the hypothesis that an increase in
complexity score will favour the nisbe variant.

The effect of complexity on variant choice is slightly stronger than the effect of the two social factors:
recall that log odds are measured from 0, so the farther from 0 a factor’s log odds are, the stronger the
effect. The largest log odd number for text type is 0.31 for fairy tales (in favour of the s' r- possessive),
and for provenance it is 0.15 for Upper Egypt South (in favour of the s' r- possessive). This makes
complexity, with a log odd number of -0.45, the stronger effect – though its preference is in the other
direction (in favour of the nisbe possessive rather than the s' r- possessive). This effect is weaker than
the effect of noun type, whose largest log odds are 1.93 for the high-status + high-status combination
(in favour of the s' r- possessive).

As shown in Figure 4.9, the majority of the s' r- tokens occur in the 0 complexity slot, declining
through the 1, 2, and 3 slots, with a few instances in some of the higher scores as well. The nisbe
possessives are more evenly distributed between 0 and 1, followed by a still substantial number in 2.
The higher the complexity score, the fewer tokens in general, but what tokens there are are more likely
to be nisbe tokens. The only exceptions are scores of 9 and 11, only due to the presence of a large set
of conjoined possessors in these two slots.

This in in contrast to the distribution in clitic possessives: the vast majority of clitic possessives
occur in the 0 complexity slot. The very few that occur in the 1 and 2 slots are much mor likely to be p;
possessives, which is similar to the nisbe possessive’s hold on the higher complexity scores for nominal
possessives, but this trend is much more abrupt in clitic possessives – compare the clitic complexity
Figure 4.9: Number of $s\, r^*$ and $nisbe$ tokens by complexity score.

However, an additional argument can be made from these results regarding complexity’s effect on clitic possession: that this is a continuum – it is simply a very small one. If this is true, then we can only assume the dearth of clitic possessives of any kind with a complexity score of 1 or 2, and the complete lack of clitic possessives with a score higher than that must is due to some sort of separate constraint on their structures. For example, adjectives do not modify pronouns, so something like this could be contributing to lower scores. In that case, it is reasonable to treat this small range of scores as a very small continuum. Even so, this finding still supports the Continuity Hypothesis: recall that a continuous factor cannot stop the change – only slow it down. That is, phrase complexity’s effect on clitic possessive variation is possibly what makes this one of the slowest document cases of language change, taking over two millennia to reach completion (Allen 2013; Kupreyev 2013; Allen 2010; Egedi 2010; Loprieno 1995; Hoch 1997; Gardiner 1957). So while phrase complexity was originally predicted not to constrain clitic
possessive variation because of the Continuity Hypothesis, the fact that it does actually supports the Continuity Hypothesis.

In that case, at least part of the reason that nominal possession is stable over time is the much more gradual nature of this variable’s complexity continuum: its less abrupt and much clearer continuous effect here is the probable cause of this variable’s stability.
Chapter 5

Discussion & Conclusions

Now that I have described the results of my analyses of each variable, I discuss the implications of these results. I address each component of my larger questions, and discuss the results as they relate to the set of predictions listed at the end of the methods chapter. There were three questions I sought to answer in conducting this research:

1. How can stable variation be distinguished from variation that leads to language change?

2. Is it possible to predict whether a given variable will remain stable, or lead to change over time?

3. Does data from 4,000 years ago and halfway across the world behave the same way as the modern English that has been the focus of most variationist analysis?

In order to address those questions, four components were necessary:

1. Time depth: in order to be sure that the stable variable is, in fact, stable, a long period of time is required.

2. Meta analysis: this situates the Egyptian stable variable in the context of other well-studied stable variables and how they behave.

3. Comparing change and stable variables: investigating Egyptian possessives allows for comparison of the stable possessive variable with the language change possessive variable.

4. Necessary preliminary investigation:
   (a) syntactic analysis: making predictions based on structure
   (b) alienability and animacy study: showing variation
Chapter 5. Discussion & Conclusions

(c) constant rate testing: the change variable is typical

Time depth was well-established for the Ancient Egyptian language: it is the oldest continually-attested language in the world, and the desert climate in which the texts were written means that a good number of them were preserved. The meta-analysis helped situate this study in the broader context of stable variation in other, more well-studied variables, and how the Continuity Hypothesis holds up when observed for those variables – fairly well. This initial support provided enough evidence for the Continuity Hypothesis to include the testing of this hypothesis in the statistical analyses of Egyptian possessives. However, since Egyptian possessives are not well-studied by variationists, three background components were necessary before conducting any statistical analysis.

5.1 Background Components

First, my syntactic analysis provided an understanding of the internal structures of each possessive variant, as well as a understanding of the demonstratives that comprise the possessive specifically. It also allowed me to suggest a timeline for the various stages of change relating to the spread of possessives:

1. Head movement occurs from $n$ to Num, and can also occur from Num to D if D is phonologically empty.

2. The possessive nisbe is an adjective.

3. All possessors except those in nisbe possessives are in the specifier position of Number Phrase.

4. The pre-nominal possessive demonstrative is the result of the emergence of a pre-nominal DemP adjunct to DP, which competes for use with an older, post-nominal DemP adjunct.

5. Over time, the pre-nominal demonstrative is reanalyzed as a Determiner head and semantically bleached from demonstrative to determiner.

6. The demonstrative in the possessive is in D, not Dem.

7. The only difference between the possessive and the possessive is the existence of a full, overt D.

8. possessives have the same structure as $s$ possessives, except that the possessor (spec/NumP) is a clitic rather than a full DP.
This predicted that we would no longer see s₃ r₃ possessives with p₃ demonstratives as the end of the reanalysis of p₃ from Dem to D approached – and indeed this was borne out by the distributional evidence in the data.

The syntactic account also provided the continuous factor group for testing the Continuity Hypothesis: phrase complexity. This was based on the structures of each nominal possessive type, showing that the nisbe possessive was possession via adjunct and therefore more likely than construct state possessives (s₃ r₃ possessives) to allow for more additional modifying elements. This was also supported by the results, discussed in further detail below.

That is, the syntactic analysis made clear predictions, which were then tested and borne out in the statistical results.

The discussion of how to measure the effects of possessum and possessor on variation in both nominal and clitic possession required a solid basis in previous literature on possessive variation, and a detailed pre-analysis of the distribution of various noun types in Egyptian. I accomplished this by observing the distribution of possessive variants in the letters of a particular scribe, Dhutmose. Dhutmose’s letters provided valuable insight into possessum and possessor noun categories. I used the animacy and alienability constraints discussed in previous literature and applied them to Egyptian possessives, insofar as they were relevant. The categories where these constraints did not make the correct predictions for this language, namely high-status nouns, were separated their own category. This proved fruitful in the statistical analysis, which showed that these additional categories did in fact more accurately describe the effects of noun type than either animacy or alienability alone, discussed further below.

Using Dhutmose’s letters in this way also reveals possible style and/or register markers for future studies of historical languages: Dhutmose’s measurable differences in the types of possessa and possessors used in each letter were ostensibly related to his feelings towards the recipient of the letter. For example, when he was noticeably annoyed with the recipient of the Year 12 letter, he used fewer god-related possessa and possessors. Although we cannot be certain if the beginning of this letter was lost, this was evident in the body and end of the letter. While these data are not a large sample, it is possible that noun categories such as the ones I have created here could be used to measure differences in style or register, similar to the work conducted by Jankowski (2013); further investigation into this may make it possible to create a continuum of style, as suggested by Wallenberg (2013) and Fruehwald and Wallenberg (2013).

The Constant Rate Effect is the hypothesis that any given innovative variant should increase in use at the same rate over time, regardless of linguistic context. Basing my work on previous support of the Constant Rate Effect, I tested the rate of increase of the p₃ possessive variant across text types. A one-way ANOVA showed that the rates of increase of the p₃ possessive is the same for each text type –
evidence of the Constant Rate Effect. I used this evidence to support my treatment of clitic possession as a typical language change variable, making it suitable for comparison to the stable variable, nominal possession.

5.1.1 Predictions

The information obtained via these background components provided me with the information necessary to make detailed predictions about Egyptian variation in both clitic and nominal possession:

1. Under the proposal that language change and stable variation both arise from the same process, namely competing grammars, the only thing that allows variation to remain stable is the type of factor that governs it (the basic premise of the Wallenberg (2013) and Fruehwald and Wallenberg (2013) proposal). Therefore, I predicted that Egyptian stable variation will be constrained by at least one continuous factor group.

2. I predicted that nominal possessives in Egyptian are an instance of stable variation, which means that their variation should be constrained by a continuous factor. I predicted that that continuous factor group would be phrase complexity.

3. I predicted that clitic possessives in Egyptian are an instance of language change, as per the previous literature.

4. I hypothesized that the \( p^1 \) possessive derives from an older language change, with the pre-nominal \( p^5 \) demonstrative alternating with and replacing post-nominal demonstratives. From this, it follows that the same factors which constrain \( p^1 \) possessives should also constrain \( p^5 \) demonstratives.

5. Since the \( p^1 \) forms of the demonstrative and clitic possessive appear to have been stigmatized, I predicted that the more formal magical texts would disfavour these variants.

6. Since there is no stigma that we know of for nominal possessives, I predicted only that texts with more god-related and royalty-related nouns – magical texts and fairy tales – will favour the \( s^0 \) \( r^c \) possessive, as per the preliminary information discussed with the Dhuutmose Letters.

7. I predicted that the innovative \( p^1 \) forms in both clitic possession and the demonstrative variation were a result of dialect differences and/or language contact, as per Egyptological literature. I hypothesized that some locations would favour the new variant early in the change, while later in the change it will have spread across all locations.
8. I predicted that possessive variation in both clitic and nominal possessives would be constrained by possessum category, as per the Egyptological claims and previous literature on possession in other languages. Similarly, I also predicted that possessor category would have an effect.

9. I predicted that nominal possessives are a different variable from clitic possessives, and therefore would not necessarily be affected in the same way by the same constraints as clitic possession, including in the above prediction. That is, nominal possessives might not have the same split with the same nouns as clitic possessives do.

5.2 Comparing Variables

I tested these predictions above in my statistical analyses of each variable, and use the results to compare the stable variable to the change variable.

5.2.1 Change Over Time: The Rise of $p^\circ$

First, I was able to confirm my syntactic predictions regarding the various stages of language change. We do see the first instances of $p^\circ$ demonstratives in Dynasty 6, and the first instances of $p^\circ$ possessives in Dynasty 12. Additionally, towards the end of the investigated time period (Dyn. 20), there are no more tokens of $s^\circ r^\circ$ possessives and $pr.f$ possessives with pre-nominal demonstratives. While there were fewer than 10 possessive $s^\circ r^\circ$ tokens that occurred with demonstratives at all, the only ones that did occurred before Dynasty 20. This supports my claim that the $p^\circ$ demonstrative is reanalyzed as a Determiner head, leading to the emergence of $p^\circ$ possessives as soon as this reanalysis begins. This reanalysis was predicted to begin during the Middle Kingdom, which is when I find the first instances of $p^\circ$ possessive tokens.

Second, it is made evident by the statistical results that demonstrative variation is change over time. It is clear even from the preliminary distributional and Constant Rate Effect results that clitic possession is also an instance of language change, with the innovative $p^\circ$ form replacing the old $pr.f$ form over time – supporting this prediction as well. The logistic regression results make this even clearer by illustrating the strong effect and interaction of provenance and text type, allowing me to map the trajectory of the spread of the $p^\circ$ variant across Egypt over time. While the clitic possessive $p^\circ$ originated in Upper Egypt North during the Middle Kingdom, the demonstrative $p^\circ$ appears to have originated in Upper Egypt South during the Old Kingdom, and spread relatively quickly from there.\footnote{There are, however, some attested $p^\circ$ tokens from Lower Egypt during the latter part of the Old Kingdom, which did not appear in my dataset (Edel 1955). It is possible that $p^\circ$ simply spread fairly quickly to Lower Egypt, or that my...}
While the *p* demonstrative diffused across Egypt and its rate of use increased in other locations over time, Upper Egypt South retained more *p* demonstratives than the other two regions. As it spread northward into Upper Egypt North and Lower Egypt, it found the most favour in fairy tales, although it originated in letters in Upper Egypt South. We can tentatively conclude that, while Upper Egypt South is the progenitor of the *p* demonstrative, it is Upper Egypt North which embraces this variant most strongly. Likewise, while letters are the textual environment in which this new form first emerges – a vernacular text type, consistent with the emergence patterns of most other language change variables – it gains the most headway in tales during the Middle and New Kingdoms. The demonstrative data are consistent in these aspects with clitic possessive data: while letters are the point of origin for *p* possessives as well when they emerge in the Middle Kingdom, it is in the fairy tales of Upper Egypt North where this variant sees the most favour.

This data provides us with a much fuller history of *p* than we had previously. It begins during the Old Kingdom (c. 2686 BC – 2181 BC), in demonstratives. The capital city during this time was Memphis, in the north, but there were already other urban centres located throughout the country (Shaw 2009). This is the period during which my data find that the *p* demonstrative emerges in Upper Egypt South, as early as Dynasty 6. We know that new forms usually begin in the vernacular language of urban centres (Tagliamonte 2006), and the *p* demonstrative originated in the vernacular text type, letters, so it is likely that this form originated in an urban centre as well. The most likely candidate for this is Thebes (modern-day Luxor), one of the most famous and heavily populated southern cities of Egypt throughout the country’s history. Indeed, Kupreyev (2013) first finds early examples of the *p* demonstrative on a tomb inscription depicting everyday life from Hamra, whose closest ancient urban centre was Thebes (Kupreyev 2013: 1). Adding further prestige, at the end of the Old Kingdom and into the First Intermediate Period, a rival line of kings in Thebes ruled Upper Egypt separately from the northern part of the country (Shaw 2009). The resulting increase in status and independence of the region is likely what allowed the *p* demonstrative to begin to make its way into the north of Upper Egypt.

During the Middle Kingdom, Theban King Mentuhotep II (Dynasty 11) took the rest of the country, reunifying Egypt – but now under Theban rule (Shaw 2009). This by extension likely enabled the spread of the *p* variant northward into Lower Egypt. Mentuhotep II ruled for 51 years (2061 BC – 2010 BC), solidifying the *p* demonstrative’s presence across the country. It is during this period, Dynasties 11-12, that we see the emergence of the *p* possessive in the letters from the north of Upper Egypt. It is possible that this region, in the geographic middle of the conflict between the Lower Egyptian 10th Dynasty and

\footnote{dataset was lacking in tokens from the Old Kingdom.}
Upper Egyptian Theban (11th) Dynasty, wished to identify more closely with its Theban neighbours as Mentuhotep II took hold of the remainder of the country.

It was also during this time that the famed “wisdom literature” became popular – the instruction manuals for social climbers, advising Egyptians that one must always speak and conduct oneself in the “proper way” (Fischer-Elfert 2003: 119-121). This presumably meant that a new linguistic form was anathema to the Egyptian elite, and the new possessive form became stigmatized almost as soon as it emerged. Indeed, our only piece of metadata regarding $p$ is from Dynasty 12, shortly after the possessive $p$’s emergence. Recall that the Mentuwoser stela describes a man “who speaks according to the style of the nobleman, free of saying $p$” (Sethe 1960: 79:17). This stela comes from Abydos, in the north of Upper Egypt – the very region where the $p$ possessive emerged. The capital city of this period was Lisht, also in the North of Upper Egypt.

It was also during the next dynasty (Dyn. 13) that power moved north into Lower Egypt again, and invasion came via the Hyksos from the Levant, marking the Second Intermediate Period (c. 1657 – 1549 BC), during which Egyptians were subject to foreign rule (Booth 2005; Redford 1970). Eventually the Theban king Ahmose retook Egypt from the Hyksos at the outset of Dynasty 18, and so began Egypt’s New Kingdom period (c. 1550 – 1077 BC) (Shaw 2009).

During the Amarna Period (c. 1353 – 1332 BC), when Akhenaten encouraged new forms of art and writing, he also moved the formerly Theban capital to Amarna – located in Upper Egypt North (Shaw 2009). It is during and after this period that the $p$ possessive takes over in this region and begins to spread in earnest to the rest of Egypt – first in Lower Egypt, and finally to the last bastion of tradition, Upper Egypt South – ironically the progenitor of $p$ demonstratives.

The trajectory of the $p$ variant – first in demonstratives, followed by a clear link to its emergence in possessives – provides support for the prediction that the $p$ possessive is a result of the reanalysis of the $p$ demonstrative into D. It also provides support for the prediction that $p$ demonstratives were originally a regional variant, apparently of Upper Egypt South. Meanwhile, it suggests that $p$ possessives were a regional variant of Upper Egypt North before spreading across the rest of Egypt.

### 5.2.2 Stability Over Time: Nominal Possession

The statistical results also provided support for the prediction that nominal possessive variation is stable over time: time period was not found to be a significant factor in the logistic regression analysis. Furthermore, the distributional results by dynasty indicated that the ratio of $s\text{\_ nominative}$ to $nisbe$ possessives over time remains relatively stable. Indeed, there was no significant different between adjacent time
periods – the only periods that differed were the earliest (Dyn. 11-14) from the two latest dynasties (Dyn. 19-20).

Based on this difference, the notion that nominal possession is not stable, but rather the slowest instance of language change ever observed, must be discussed as well. If this were true, it would not preclude nominal possession from being compared to clitic possession. Indeed, nominal possession as an incredibly slow language change would be perfectly in line with the Continuity Hypothesis, which predicts that no variation is ever truly stable over time. The prediction is that specialization along a continuum cannot truly stop the change – it only slows the change down immensely.

However, it is more likely that the difference in Dyn. 11-14 is due to the distribution by provenance in these time periods: Upper Egypt North favours the $s$ possessive slightly. This preference helps highlight the differences between nominal and clitic possession in two ways: first, it accounts for the slight difference in distribution shown in Dyn. 11-14, showing that nominal possession likely is stable over time. Second, the $s$ possessive is the structural equivalent of the $pr.f$ possessive, and if nominal and clitic possession were the same variable, we would expect these two to pattern together. The fact that Upper Egypt North slightly favours the $s$ possessive while also strongly favouring the $p$ and not the $pr.f$ possessive is evidence that the two possessive variables are not equivalent.

These results also provide an elaboration of the studies in the meta-analysis in two ways: first, they make use of a much longer timeframe for investigating the stable vs. changing nature of sociolinguistic variables; second, the stable variable is morphosyntactic while the only stable variables analyzed in the meta-analysis papers were phonological ($ing$ variation and $t/d$ deletion). Therefore, future work would benefit from a search for modern morphosyntactic variables hypothesized to be stable over time, so that we might use textual data to investigate their stability using a larger time depth than would be possible for phonological variables. Alternatively, if there were a way to observe spelling differences in earlier time periods that might be related to either $ing$ variation or $t/d$ deletion, this would provide insight into their history and stability as well.

5.2.3 The Effects of Noun Type

More evidence that clitic and nominal possession are two different variables is found in the way noun type – possessum and possessor category – constrain each variable.

First, noun-type was not significant in demonstratives. This is initially not surprising: previous literature on Egyptian indicates that alienability, a feature tied to possession, is the relevant noun characteristic. However, as found by both the initial study of Dhutmose’s letters, the distributions in
the larger dataset, and the statistical results for possessives, alienability is not the element at play here. Therefore, it is not clear why demonstratives do not have a noun type preference. It is possibly due to the high number of demonstratives occurring without any noun at all, or potentially due to the dearth of demonstrative tokens in general. If in future, demonstrative-heavy texts could be obtained, this might provide more insight. Nonetheless, these results do provide a reminder that demonstrative and possessive constructions have different characteristics.

In clitic possession, it is only possessum type which is significant. This factor group was significant for nominal possessa as well, but even in the initial collapsing of categories based on distribution, clitic possessives’ possessa did not pattern the same way nominal possessives’ possessa did. Some patterns were the similar: high-status possessa favoured the pr.f possessive in clitic possession, and its structural equivalent in nominal possession, the s r possessive.

Neither possessive type’s distribution of possessa supported either an alienability or an animacy hierarchy. In terms of alienability, clitic possessives’ high-status possessa included typically inalienable nouns like body parts and names, but also typically alienable nouns such as royal persons and gods. Family possessa, also typically considered inalienable and included in the animate/official category, had the opposite trend of high-status possessa, favouring the innovative p variant instead. Likewise, in nominal possession, typically inalienable nouns like body part possessa did not strongly prefer one variant over the other, while those inalienable nouns in the high-status possessum category (along with alienable nouns in the same category) did show a strong preference for the s r possessive.

In terms of animacy, clitic possessives’ animate/official possessa (mainly family members and government officials) favour the p variant, while the high-status category’s animate possessa, gods and royalty, favour the pr.f possessive. Similar trends are seen in nominal possession as well: the similar high-status possessum and possessor categories, which included (animate) royalty and gods, strongly favoured the s r possessive, while family possessors (also animate) and animate possessa favoured the nisbe variant.

Possessor was not significant for clitic possessives, but the fact that it was significant for nominal possessives further highlights the differences between clitic possession and nominal possession. In nominal possessives, possessor had a very strong interaction effect with possessum: the strongest preference for the s r possessive is seen in high-status possessa occurring with high-status possessors. Family possessors strongly favour the nisbe variant, but this effect also depends on the possessum: body part possessa with family possessors have a slightly reduced preference for the nisbe than do “other” type possessa with family possessors or animate possessa with family possessors.

These results provide support for the prediction that nominal possession and clitic possession are different variables, and support for the prediction that noun type will have an effect on variant choice.
Additionally, the noun categories provide us with another piece of useful information. We have no meta-data regarding the social meaning attached to either nominal possessive variant as we do for the pr variant of clitic possession. However, we would expect to find such meaning attached to a stable variable, as per (Labov 2001: 6). Indeed, it is only reasonable that any variable that remains in the language long enough would develop some social significance. And while we lack any explicit social information, these factor groups – as well as the text type factor group discussed below – can provide us with an idea of what that social information was for nominal possession.

To elaborate, letters required the use of high-status possessa and possessors – namely in those bombastic introductions and closings exemplified in Dhotmose’s letters, which meant more st pr possessives as various royal and godly references were made. But it also meant that more references to family members and other mundane nouns were included. Meanwhile, magical texts would refer quite frequently to deities for protection and discussed various spirits, who could either protect from or cause illness. High-status nouns were the place for the st pr possessive, while more familiar nouns (literally in the case of family nouns) were the province of the nisbe possessive, and the types of text in which we find each reflect Egyptians’ social structure, beliefs, and attitudes.

Future research on this subject would benefit from an analysis of what types of words are used more frequently in which register – similar to the research conducted by Jankowski (2013) on new register(s) and the types of words used there. This would provide us with information about register and style in general, also allowing us to work towards identifying a style/register continuum as Wallenberg (2013) and Fruehwald and Wallenberg (2013) suggest.

5.2.4 Text Type: The Surprising Influence of Fairy Tales

In conjunction with the effect of noun type on both possessive variables, there is also an effect of text type. This effect is strong for clitic possessives and for demonstratives – aiding in our understanding of the demonstrative’s birthing of the pr possessive, as discussed above. However, it is also relevant for another prediction – the one based on the piece of meta-data stigmatizing pr, stating that this possessive variant will be disfavoured in the most formal text type, magical texts. Indeed, the results for clitic possession indicate that this is true: magical texts strongly disfavour the pr possessive, preferring the older pr.f. This is expected given the meta-data stigmatizing the use of pr, and also the understanding that magical texts and other formal writings were expected to be written in the most formal of registers, emulating the Middle Egyptian stage of the language (i.e. little to no pr, among other characteristics),
even when Late Egyptian was the spoken stage.

It is also expected, therefore, that $p^1$ should be more prevalent in the most vernacular texts, in this case letters. This is true of the results for both demonstratives and possessive $p^1$ – and it is letters which were the point of origin for both $p^1$ demonstratives and $p^1$ possessives.

However, given that magical texts were expected to be written in an essentially $p^1$-less register (though we see from the data that there are $p^1$ tokens in this text type as early as Dyn. 19), fairy tales were also included in order to have a more balanced understanding of this factor group’s effect.

And indeed, the effect of fairy tales on both variables was somewhat surprising and unpredicted. For nominal possessives, fairy tales pull high-status noun combinations into a higher proportion of $nisbe$ possessives, despite these nouns favouring the $s^3 r^c$ possessive – a possible effect of what a fairy tale is, and who is talking to whom in these tales. That is, there may be no need for bombastic introductions as there are in letters. For clitic possessives, fairy tales strongly favour the $p^1$ possessive, and this variant’s prevalence in this text type is quite close to its prevalence in letters, the most vernacular texts. This result indicates that fairy tales were closer to the vernacular, spoken language than were magical texts.

It is not necessarily a given to associate fairy tales with the vernacular the way one would associate letters with such. However, even in modern languages fairy tales are more accessible than religious texts, and they are also easily changeable based on people’s current attitudes. Consider the Disney adaptations of various fairy tales: these modern film adaptations are often quite different from many of the original stories in various fairy tale anthologies (Grimm et al. 1988; Andersen 2006; Perrault 1993). Even those tales found in “original” anthologies were adapted to suit the time in which they were collected – older, regional variants existed that were changed by the collecting authors in order to satisfy the morals, values, and sensibilities of the time (Windling 2002). All this is to say that these kinds of tales appear to be linked to the fabric of the society in which they are told, including the way the people in that society speak. Unlike religious texts, which are often considered too sacred to be tampered with or altered, fairy tales are easily adapted, changing to suit the needs of the culture and the time – the sociocultural context in which the words are spoken or written. And while Egyptian fairy tales are not necessarily cut from the same cloth as European fairy tales, similar comparisons can be made: we do see some differences in writing across various versions of each Egyptian tale, in those tales for which we have multiple copies. That is, copies of the same fairy tale are not always exact copies of each other; they are the same in terms of events in the story and particularly potent sentences, rather than necessarily containing all the same sentences.

Given their nature, then, fairy tales would lend themselves well to being a less formal register than the more religious magical texts. While still a different register from letters in their own right, fairy tales
provide a slightly different view of possessive variation than letters would.

These results highlight the differences in each possessive variable: text type had a much stronger effect on clitic possession than on nominal possession. They also support the prediction that text type will have an effect on variant choice, specifically that pr possessives will be disfavoured in magical texts. Finally, they also provide the beginnings of a data-driven understanding of what linguistic elements comprise each register in Ancient Egyptian, providing a more nuanced understanding of register in this language. Future research in this area would benefit from the inclusion of more text types – legal texts, mathematical texts, and poetry would be useful inclusions.

5.3 Complexity: The Continuity Hypothesis

Complexity was found to be significant, as predicted, for nominal possession. It was also found to be significant in the direction predicted: the higher the complexity score, the more likely we are to see the nisbe possessive instead of the s r. This result supports the Continuity Hypothesis: nominal possessive variation is stabilized because of the continuous nature of phrase complexity. No single environment favours either variant; instead, one variant simply becomes more likely to occur as we move along the continuum in one direction, while the other variant’s likelihood is similarly increased marginally by moving in the other direction.

Complexity was significant for demonstratives as well. However, its significance here was, like some of the results in the meta-analysis, not along a continuum: constraint rankings jumped from 0 to -1 to 1+. This finding also supports the Continuity Hypothesis: as a change variable, demonstratives were predicted not to be constrained by a continuous factor in a continuous way. Such a constraint would have been predicted to stabilize the variation, as it did for nominal possessives.

Complexity was also significant for clitic possessives, and it was significant in the same direction as nominal possessives – the higher the complexity score, the less favoured the pr.f possessive was, as the s r in nominal possessives was increasingly disfavoured as complexity score increased. However, this finding does not contradict the Continuity Hypothesis.

Under one possible interpretation, this factor group is binary rather than continuous. Nominal possessives’ distribution in terms of complexity score exists along a nice, long continuum, with complexity scores reaching as high as 12. In contrast, clitic possessives’ complexity scores go only as high as 2, with the vast majority of tokens having a score of 0. It is true that the few tokens that occur with a score of 1 are more likely to have a pr than a pr.f possessive and that the (even fewer) tokens with a score of 2 are categorically pr. But this trend is much more abrupt than in nominal possessives,
indicating that this may be a two-way split where 0 complexity favours the pr.f possessive and more than 0 favours the pr possessive.

Alternatively, it is possible that this is a continuum – simply a very small one – and that clitic possession is constrained by phrase complexity in a continuous way. This interpretation would still support the Continuity Hypothesis, however: as a continuous factor cannot stop the change, only slow it down immensely, this factor’s significance in clitic possessive variation could be the explanation for the extreme slowness of the change, causing it to take over two millennia to reach the plateau of the S-curve.

5.4 Conclusions

By applying modern syntactic and sociolinguistic methodology to an Egyptological puzzle dating back 200 years and three 4,000-year-old sociolinguistic variables, I have been able to contribute new knowledge to three fields: sociolinguistics, theoretical syntax, and Egyptology.

This project was begun in order to answer three questions:

1. How can stable variation be distinguished from variation that leads to language change?

2. Is it possible to predict whether a given variable will remain stable, or lead to change over time?

3. Does data from 4,000 years ago and halfway across the world behave the same way as the modern English that has been the focus of most variationist analysis?

In order to address these questions, I have used sociolinguistic methods to show that clitic possession and nominal possession are different enough to be suitably compared, while also being similar enough that the comparison is useful. I have shown that clitic possession follows the typical language change trajectory: the innovative form increases at the same rate across linguistic contexts, beginning in one location and slowly diffusing across the language region. I have shown that nominal possession is stable variation, that its constraints differ from those of clitic possession, namely in terms of complexity and possessor category, as well as in the strength of the effects of location and text type. I have also provided evidence for the Continuity Hypothesis, which gives us the means to predict whether a given variable with be stable or change over time – and how quickly it might do so.

While the data collected were not intended for the purposes for which they were used here, either by the creators of the online corpora or by the Ancient Egyptians themselves, the results they have yielded are well worth the effort of re-purposing the corpora for sociolinguistic analysis. Indeed, any study of
stable variation benefits immensely from a large of time depth. It is also beneficial for the study of language change: the replacement of *pr.f* by *p* seen in clitic possession is evidence that language change can happen much more slowly than over the course of a few generations, raising the possibility that we do not know how many modern “stable” variables would actually be stable, if given more time.

This project also provides insight into Ancient Egyptian culture. Thousands of years after their writers lived and died, the stories, magical treatises, and letters used for this study of language variation breathe new life into this ancient society, and underscore its similarities to our own – people who lived thousands of years ago are people all the same: taking offense at social slights, making puns and lewd jokes, reaching out to communicate with beloved family members. And so it is with language change. While there are some differences across languages, and these must always be taken into account, the results of this investigation highlight what the Uniformitarian Principle predicts: the forces acting on language variation and language change are the same now as they always have been.
References


REFERENCES


REFERENCES


Gardiner, Shayna. 2012. Middle Egyptian morphotactics. URL https://www.academia.edu/34234098/Middle_Egyptian_Morphotactics, University of Ottawa manuscript.

Gardiner, Shayna. 2014. Prized possessions: Variation in Ancient Egyptian possessive constructions. URL https://www.academia.edu/34234097/Prized_Possessions_Variation_in_Ancient_Egyptian_Possessive_Constructs, university of Toronto manuscript.

Gardiner, Shayna. 2015a. The syntax of Middle and Late Egyptian possession. URL https://www.academia.edu/34234096/The_Syntax_of_Middle_and_Late_Egyptian_Possession, university of Toronto manuscript.


REFERENCES


REFERENCES


REFERENCES


Kerr, Adrian. 2008. Ancient Egypt and us. Fort Myers: Ferniehirst Trading LLC.


REFERENCES


Marantz, Alec. 2001. *Words*. MIT manuscript. URL

http://babel.ucsc.edu/~hank/mrg.readings/Marantz_words.pdf.


REFERENCES


REFERENCES


