The Materiality of Metaphor in Mayan Hieroglyphic Texts: Metaphor in Changing Political Climates

Dinkel A. Rebecca
University at Albany, State University of New York, bdinkel@albany.edu

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THE MATERIALITY OF METAPHOR IN MAYAN HIEROGLYPHIC TEXTS:
METAPHOR IN CHANGING POLITICAL CLIMATES

by

Rebecca A. Dinkel

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ABSTRACT

Recent research on the discursive and rhetorical forms of Mayan hieroglyphic texts has demonstrated how language and writing were used to frame, not just represent, Pre-Columbian Mayan history. Research on the role of metaphor in this framing has only just begun, and despite the well-known multimodal character of Mayan hieroglyphic texts, research on the role of metaphors in pictorial images has been even more limited. Previous research has not fully documented metaphor variation, particularly as it materializes across different modalities, media, places, and times. Doing so will allow for more subtle and elaborate interpretations of metaphor use and meaning in these texts, particularly its role in historical and political framing.

This study adopts a conceptual definition of metaphor, which views metaphor as the use of one semantic domain to provide semantic structure to another. This definition can explain continuities of meaning across different modalities, media, times, and places. This contrasts with other approaches that limit metaphor to set rhetorical forms and thus cannot capture how metaphor might vary across usages. A mixed-methods approach is used that integrates corpus linguistics to account for variation through statistical analysis, and discourse analysis to account for continuity of use through examination of the communicative context.

This study examines the political metaphor RULERS ARE TREES, which uses well-known plant symbolism to describe and depict pre-Columbian Mayan elites. It documents (1) the forms this metaphor takes when materialized in the different modalities of writing and pictorial images, (2) how these modalities affect the semantic structure of the metaphor, (3) how this single metaphor materialized across the different media of monumental architecture, portable objects, and codices, across different places or polities, and times by different historical actors, and (4) how this variation and its socio-political and historical context of use ultimately led the metaphor
to change. This study focuses on variation from the Early (250 -599 A.D.) to Late Classic (600-900/1100 A.D.) periods.

This study demonstrates that metaphor materializes distinctly in the two modalities examined. In writing, the metaphor uses distinct grammatical forms, in line with other corpus research on grammar and metaphor. Particularly, the metaphor uses the abstractive suffix and noun incorporation. In pictorial images, the metaphor materializes through the superimposition or fusion of Mayan rulers’ body parts and parts of trees. In writing, the metaphor’s semantic structure is not fully elaborated, but in pictorial images its semantic structure must be elaborated because it is a compositional modality, showing precisely how a ruler was similar to a tree.

This study also shows that variation of the metaphor was encouraged by changing political climates at the end of the Late Classic period that saw an increase in political competition. This partially manifested in a proliferation of hieroglyphic texts wherein elites reinterpreted circulating political discourse in novel ways. Elites from the polity of Palenque, in Chiapas, Mexico, created novel uses of the metaphor in writing by reinterpreting nonmetaphorical language in light of pictorial instances of the metaphor on vases, and transferred the metaphor to a different media, monumental architecture. Variation of the metaphor was part of co-occurrent linguistic change where distinct social dialects were emerging. These processes led to a metaphor shift in which a particular lexical item was semantically extended to have a new metaphorical sense.

These results have significance for understanding the role of the materiality of metaphor in the construction of metaphorical meaning, something that has been underexamined due to the universalizing tendency of conceptual approaches that do not fully document metaphor variation. As a result, this study challenges some tenets of conceptual approaches and develops a more
robust method for understanding metaphor variation, from a diachronic perspective. These results also highlight the importance of metaphor in understanding linguistic change in Mayan languages.
ACKNOWLEDGEMENTS

This project would not have been possible without the support of several institutions and individuals. I am forever grateful for the encouragement, advice, and resources they provided for me to complete this project. Any errors contained within are my own.

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Mora-Mora-Marín’s creation of a database that could be run on corpus linguistic software was invaluable. Further, David Mora-Mora-Marín’s willingness to share his detailed data and knowledge with me, particularly of Mayan hieroglyphic vases, was essential to showcase the role of different media in language change. I also feel lucky to have had a committee with such open minds to a kind of project that has not been done before. I am indebted to them for their thoughtful mentorship on this project and many other endeavors over the years and would not be where I am today without them.

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linguistics courses and support of my research, even when it was outside of their areas of expertise, helped me develop the linguistic aspects of my project. Particularly, I am thankful to Jenny Lederer for introducing me to the study of metaphor, her support during the early stages of this project, and for encouraging me to develop my own research trajectory. Since Jenny introduced me to the study of metaphor, I have not looked back. I am also thankful for the rich insights and knowledge I have gained from those participating in the biweekly, virtual, *Glyphs and Quarantinis* workgroup, and the countless Mayanist scholars who have come before me, whose work I build upon in this study.

I would also like to thank the countless number of my peers, family, and friends who have helped support me along the way, a few of which I will mention here: Crystal Sheedy, Jennifer Doherty, and Aaron Bentley. No matter where I was at with my research or degree, they listened to me and encouraged me along, believing in me when I was not sure I could believe in myself. Aaron bore the brunt of this, often with a smile, through listening to my presentations, reading my papers, countless museum trips and ones abroad - learning many things about pre-Columbian Mayan society that he probably would not have otherwise, which is no small task for someone who is not a Mayanist scholar. Last, I am forever grateful to my grandmother, Phyllis Panelli, whose love of art history inspired me to pursue the path I am on today and instilled in me the belief that my education does not end with my degree.
To Grandma and Aaron

Que será, será

(Drawing by Linda Schele © David Schele (2000: SD5503); photo courtesy of Ancient Americas at LACMA (ancientamericas.org))
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Table A.4. Sources and data sampled for pictorial images on vases. Number of images sampled only includes pages with pictorial images that are still visible and not eroded. Provenience information is not provided because most of the extant codices were not found in situ.
The complex multimodal quality of the pre-Columbian Mayan hieroglyphic textual tradition (300 B.C. – 1697 A.D.)\(^1\) that seemingly fuses writing and pictorial images, has contributed to its fascination, standing in stark contrast to Western styles of text production. While Mayan hieroglyphs represent features of a language – its sounds, grammatical features, and units of meaning, the signs of this writing system can be used as iconographic symbols and are often embedded in accompanying pictorial images. Further, the two modalities of writing and pictorial images often share design elements that, to the Western viewer, make these modalities appear indistinct. Though these modalities can be distinguished by occupying discrete locations in hieroglyphic texts, Mayan scribes would play with their layouts for rhetorical effect. In fact, it has long been noted that there is only one word for writing and painting in Mayan hieroglyphic texts – *tz’ihb’* (Brown 1991; Houston & Stuart 1992; Tedlock 1992).

This complex multimodality of Mayan hieroglyphic texts, so visually distinct from Western styles, led some early scholars to deny that the hieroglyphs were phonetically based, representing the speech sounds of a language, and instead, only logographically based (e.g. Thompson 1950, 1962). Only being able to decipher calendrical signs, this approach contended that the texts only represented arcane, astronomical, and religious topics. Though many early attempts to show the Mayan hieroglyphs were phonetically based failed or were unacknowledged (e.g. Rosny (1876); Thomas (1888)), later work used these texts’ complex multimodality to

\(^1\) The pre-Columbian Mayan hieroglyphic textual tradition extended into the colonial period, which began around 1500-1521 AD, discussed further in chapter (2).
successfully demonstrate this phonetic basis by noting the relationship between pictorial images and recurring hieroglyphic signs (e.g. Knorozov 1952, 1967). Other researchers demonstrated that Mayan hieroglyphic texts represented the history of the archaeological sites in which they were found (e.g. Berlin 1958; Proskouriakoff 1960). Though this approach afforded much of what we know about Mayan hieroglyphic texts today, it emphasized literal, referential interpretations. However, this approach creates tensions for interpretation when the relationship between text and history is indirect or abstract. An example that will be focused on in this study is from Loughmiller-Cardinal (2019) who demonstrated that there is no evidence, in terms of chemical residue or use-ware, that some kinds of Mayan hieroglyphic vessels were used for drinking, despite these vessels being labeled as having this function. Thus, more can be gleaned from Mayan hieroglyphic texts if we consider subtler or more elaborate frameworks for interpreting texts, taking into account a broader range of information that was available to the writers and their interlocutors, and a wider range of interpretive frameworks than the narration of sequential events.

More recent work has focused on this goal, particularly on the ways in which the authors of Mayan hieroglyphic texts actively framed this history, often for political ends. This work has afforded new methods of interpretation for understanding this framing through detailing some of the discursive and rhetorical forms of these texts (e.g. Hull & Carrasco (2012)). Such research is necessary given that all texts are products of a particular socio-cultural and historical worldview that is often framed by such rhetorical forms. Metaphor, and relatedly metonymy, has been shown to play a key role in the textual framing of socio-cultural and historical worldviews (e.g. Kimmel (2004)). However, work on the role of metaphor and metonymy in framing in Mayan hieroglyphic texts has only just begun, from a variety of perspectives. Some have treated
metaphor and metonymy as special kinds of rhetorical forms, as symbolism, or as a conceptually based process (e.g. Hoopes and Mora-Marín (2009); Hull (2012); Justeson (2010)). Though these early studies have started to document the use of metaphor and metonymy in Mayan hieroglyphic texts, they have only afforded a limited view of metaphor and metonymy. These studies have not fully documented the variation of metaphor and metonymy, particularly as they materialize across different variables, such as different modalities, media, places, and times. Such documentation will allow for more integrated interpretations of the use of metaphor and metonymy and meaning in Mayan hieroglyphic texts. Documentation of variation of metaphor and metonymy is the aim of this study, though it will primarily focus on metaphor. Particularly, this study will document variation in how metaphor materializes in the different modalities of writing and pictorial images; the different media of monumental architecture, codices, and portable objects (particularly vases); in different places, or polities; and times, focusing on variation from the Early (250-599 A.D.) to Late Classic (600-900/1100 A.D.) periods.

To fully document metaphor variation, it is necessary to use explicit research frameworks developed for analyzing metaphor. However, like research approaches to analyzing Mayan hieroglyphic texts, research approaches to metaphor have afforded limited views on their subject. For example, approaches that limit metaphor to select rhetorical forms, a priori, limits documentation of how metaphor can vary. This limitation is seen in one of Aristotle’s (1997) criteria of metaphor in which metaphor is contended to simply be a shortened simile that omits the use of like or as, such as in the statement Achilles is a lion which could be a restatement of the statement Achilles is like a lion. This criterion cannot determine other forms in which metaphor may materialize. For example, it cannot answer whether one should count examples
like *Achilles’ mane is thick* or *Achilles is the leader of the pride* or *Achilles roars* as metaphors, and if they are, whether they are all the same metaphor.

Further, such approaches contend that metaphor is reducible to a synonymous, literal expression – failing to capture metaphor’s role in textual framing and in the creation of new meaning (e.g. Davidson 1978). In contrast, conceptual approaches to metaphor, particularly Conceptual Metaphor Theory, have defined metaphor based on its conceptual, or semantic, structures and relationships. This approach remedies shortcomings of the rhetorical approach because it allows a single metaphor to underlie different materializations across variables. However, defining metaphor as strictly conceptual has strained systematic metaphor identification and analysis, with many researchers failing to use specific linguistic, visual, or other forms and criteria in metaphor identification and analysis. These researchers also do not use examples from actual discursive contexts to support their claims. For example, if a metaphor does not have to be in form of a shortened simile (*X is Y*), how do you identify a given example as being a metaphor, and as having what conceptual relationship? Thus, Conceptual Metaphor Theory has failed to document much of metaphor variation and instead emphasized assumed universal attributes of metaphor.

This study adopts a conceptual definition of metaphor since it allows for a single metaphor to materialize across distinct modalities (writing and pictorial images), media (monumental architecture, portable objects, and codices), places (polities), and times (Early (250-599 A.D.) to Late Classic (600-1100 A.D.) periods). Specifically, this study adapts a definition from Conceptual Metaphor Theory (Lakoff & Johnson 1980) that defines metaphor as “*understanding and experiencing one kind of thing in terms of another*” [emphasis added] (Lakoff & Johnson 1980:5). This conceptual definition is necessary because other definitions do
not allow for continuities of meaning in multimodal texts or across texts. However, this study uses the definition of metaphor as, *the use of one semantic domain, or concept, to provide semantic structure for another*. This definition is adapted to take a neutral stance on the issue of how metaphor is cognitively processed, something which is discussed further in chapter (3). To remedy the methodological shortcomings of a strictly conceptual approach, this study uses a mixed-methods approach that integrates corpus linguistics and discourse analysis and that can systematically document metaphor variation across variables in their discursive context. Corpus approaches are effective for reviewing large bodies of data through providing big picture statistics and explicit criteria for searching for and identifying metaphors. In contrast, corpus approaches do not analyze the entire discursive context of examples, limiting its ability to help with understanding a given example’s meaning. This study thus additionally uses a Bakhtinian approach to discourse analysis as outlined by Wortham and Reyes (2015) that can analyze metaphor use across different texts in its discursive and historical context as this use evolves and changes. This approach to discourse analysis is also useful because it traces how texts and their linguistic patterns become associated with certain social meanings and social identities as they are repeated, reified, and changed. Thus, this approach can document the social role of metaphor in linguistic framing. This study also analyzed how pictorial images coupled with such discursive patterns, given the multimodal quality of these texts.

Doing discourse analyses of parts of a corpus to define corpus searches also helps avoid imposing the presuppositions of a researcher on the examined data. The basis of this study was determined by a previous discourse analysis by the author on a small set of multimodal texts from the Cross Group monuments at the site of Palenque, in Chiapas, Mexico. This analysis showed usages of a political metaphor unexamined by other scholars from the Late Classic
period (600-900 A.D.), which was a time of changing political climates in the Mayan area. Specifically, in the Late Classic regional power networks began to shift due to a proliferation of smaller polities. Correspondingly, there was an increase in hieroglyphic texts, which formed an integral part of political competition amongst elites (Munson & Macri 2009; Munson et al 2016). The novel metaphor found at Palenque thus had potential for elucidating the relationship between political rhetoric, particularly, political metaphor, and changing political climates. Particularly, this novel metaphorical use represented the conceptual metaphor **RULERS ARE TREES**, where the semantic domain of **TREES** provides semantic structure to the domain of **RULERS**.

The use of trees and other plants in political symbolism has long been noted by Mayanist scholars who have argued that much of pre-Columbian Mayan political power rested in elites’ control of and relationship to agriculture. For example, there are a plethora of attested examples where rulers are directly described and depicted as having attributes of trees and other plant life. This study also thus contributes to documenting this symbolism through the metaphor analysis provided. Specifically, this study examines (1) what forms the metaphor takes when it materialized in different modalities in Mayan hieroglyphic texts, (2) how the given modality of expression affected the expression of the underlying semantic structure of the metaphor, (3) how this single metaphor was materialized by different historical actors across texts from different places and time periods, and (4) how this variation of the metaphor and its socio-political and historical context of use ultimately led to the metaphor’s change. Further, this study broadly examined how this metaphoric shift was part of wider linguistic change during the Late Classic period when distinct social dialects were beginning to emerge in the Proto-Ch'olan language family (Hruby & Child 2004; Kaufman & Norman (1984); Lacadena & Wichmann 2006; Mora-
Marín with Wiesen 2019). This study also contributes more broadly to the field of metaphor research by challenging key claims from Conceptual Metaphor Theory that ignore any role for the materiality of metaphor in understanding its use. Particularly, this study challenges that the materiality of metaphor does not affect the semantic structure of a given metaphor, and thus calls into question any universalizing claims of metaphor structure across languages and cultures. This study also contributes to other research on metaphor that has attempted to document metaphor variation – contra Conceptual Metaphor Theory.

An outline of this study is as follows:

This study begins in chapter (2) ‘Modalities, Media, and the Pre-Columbian Mayan World’, which broadly discusses the complex multimodal nature of Mayan hieroglyphic texts and how this materializes in various hieroglyphic media. Chapter (2) also contextualizes the use of pre-Columbian Mayan hieroglyphic texts in their socio-historic context, focusing on these texts’ roles in political action. This includes a discussion of the role of plant symbolism in Mayan political texts as well – given that the metaphor examined in this study uses such symbolism. Finally, chapter (2) elaborates the communicative affordances of a given modality and medium in pre-Columbian Mayan texts, where communicative affordances are what is possible to express in a given modality or medium given its physical properties and the socio-historic context that contribute to its signification (Kress & Leeuwen 2010: 215–217). Chapter (2) thus lays the groundwork for understanding how metaphor might materialize across different modalities and media given their communicative affordances.

Chapter (3) ‘Bridging Modalities & Media: A Mixed-Methods Approach’ focuses on detailing the methods needed to study how metaphor materializes across different modalities, media, places, and times. As noted above, a conceptual definition of metaphor is adopted.
However, a mixed-methods approach is also used that integrates corpus linguistics with discourse analysis that allows for both a generalizable quantitative analysis and context-sensitive qualitative analysis. This chapter also details the corpora used in this study, documenting precisely how they were sampled and searched. In advocating for a mixed-methods approach, this chapter also reviews previous approaches to Mayan hieroglyphic texts, including metaphor, and different approaches to metaphor research in general. Particularly, this study focuses on Conceptual Metaphor Theory, its precursors, and critical and supportive responses to the theory.

Chapters (4-6) demonstrate how the metaphor RULES ARE TREES materializes across different modalities, media, times, and places and the discursive and socio-historic, political contexts that afforded the evolution of the metaphor that resulted in the novel uses at Palenque. Chapter (4) ‘The Linguistic Shape of Metaphor’ specifically addresses how the metaphor RULES ARE TREES materializes in the modality of writing. Specifically, this chapter examines the lexical items used to express this metaphor in addition to the grammatical forms the metaphor takes, in contrast to the metaphor’s nonmetaphorical counterparts – in line with other corpus research on metaphor. Chapter (4) also discusses what semantic structure of the metaphor is expressed in the modality of writing. Finally, this chapter documents in which media, places, and times, the metaphor in writing occurs.

Chapter (5) ‘The Visual Shape of Metaphor’ addresses how the metaphor RULES ARE TREES materializes in the modality of pictorial images, in contrast to its materialization in writing. This chapter also compares how the metaphor materializes in pictorial images to other metaphorically based lexical items that express similar visual relationships. Though this vocabulary is not used in written versions of the metaphor, it serves as a useful comparison of how visual metaphors may materialize distinctly from their written or verbal counterparts.
Chapter (5) also discusses what semantic structure of the metaphor is expressed in the modality of pictorial images and again documents in which media, places, and times the metaphor in pictorial images occurs.

Chapter (6) ‘Shifting Meanings of Mayan Hieroglyphic Vases: Metaphor across Modalities and Media in Changing Political Climates’ traces the discursive and socio-historic, political contexts that afforded the evolution of the metaphor. Specifically, this chapter provides a corpus and discourse analysis of nonmetaphorical uses of lexical items that were used metaphorically at Palenque. The analysis demonstrates how recurring discursive contexts afforded this metaphoric shift. This chapter again documents in which media, places, and times these nonmetaphorical lexical items occur. Finally, this analysis demonstrates how the socio-historic, political contexts of use of various hieroglyphic media encouraged this metaphoric shift to occur across media and modalities and how this metaphoric shift was co-occurrent with other linguistic change happening at the end of the Late Classic period.

Chapter (7) ‘Multimodal Meaning’ concludes this study and reviews its findings. This chapter shows that these findings challenge several key claims of Conceptual Metaphor Theory, most importantly its denial of the role of materiality in metaphor use and variation. Finally, chapter (7) discusses this study’s significance for research in Mayan studies and the field of linguistics more broadly.
Chapter 2 – Modalities, Media, and the Pre-Columbian Mayan World

1 Introduction

This chapter reviews the relevant aspects of the pre-Columbian Mayan world for this project – a study of how political metaphor variably materializes across modalities, media, places, and times. It is debatable how to delineate even broadly what a modality is, such as a means of perception, or a given sign system. In a sign system, a sign is broadly defined as a basic unit of form that signifies a given meaning, its signification, and is interpreted as having this signification (Peirce 1998:478). Signs can be divided into types based on the relationship between a given sign and its signification (Peirce 1984:56). An icon is a sign that shares a physical resemblance to its signification, such as a photograph that resembles its subject (Peirce 1984:56). An index is a sign that provides evidence of its signification, such as when smoke is interpreted as signifying fire. A symbol is a sign that is arbitrarily related to its signification, such as the word blue signifying the color blue in the English language (Peirce 1984:56). Delineating the boundaries of a given modality as merely a sign system or a means of perception is difficult, though, when one considers cross-cultural differences (Forceville 2009:22-23). For example, what counts as music as opposed to noise may vary from culture to culture (Forceville 2009: 22). Regardless of these issues, the following categories of modalities are helpful in most analyses: pictorial signs, written signs, spoken signs, gestures, sounds, music, smells, taste, and touch (Forceville 2009:23).

This study will focus mostly on the modalities of writing (written signs) and pictorial images (signs), and to some degree on spoken language, as this is what is represented by the
written modality. This study will also focus on how these modalities are used in different media. The term *media* is used to refer to the various technologies that are used to communicate or disseminate information, which may use and combine different modalities to do so. Hence, *multimodality* is defined as the use of more than one modality in a text. Here, texts include an example of a given media that contains writing and/or pictorial images. This chapter examines broad categories of media relevant to pre-Columbian Mayan society: monumental architecture, codices (screenfold books), and portable objects, such as vases. How a given modality materializes, or manifests, in a given medium, is based on the communicative affordances of each, or what is possible to express given its physical properties and the socio-historic context that contribute to its signification (Kress & Leeuwen 2010: 215–217). Thus, this chapter elaborates on the communicative affordances of a given modality and medium in pre-Columbian Mayan texts, given its socio-historic context. This chapter thus lays the groundwork for understanding how metaphor might materialize across these modalities and media given their communicative affordances.

Section (2) provides an overview of the relevant aspects of pre-Columbian Mayan history, political and economic structures, and pre-Columbian Mayan cosmological beliefs’ roles in these structures. Additionally, given that the metaphor examined in this study uses the semantic domain of *trees* to provide semantic structure to the semantic domain of *rulership*, this section examines the role and relationship of agriculture and plants with pre-Columbian Mayan politics, economies, and cosmologies. Section (3) reviews previous research on multimodality in Mayan hieroglyphic texts, specifically, how exactly the modalities of writing and pictorial images interact to communicate meaning in these texts, the structure of these modalities in hieroglyphic texts, and broadly, their communicative affordances. Section (4)
elaborates on the communicative affordances of these multimodal texts, in terms of specific media and their structures, including the broad categories of monumental architecture, codices, and portable objects. Section (5) provides a summary and conclusion.

2 The Pre-Columbian Mayan World: History, Political and Economic Structures, Cosmologies, and Agriculture

This section provides a broad overview of some of the relevant aspects of the pre-Columbian Mayan world for this study. This section draws substantially on Sharer & Traxler’s (2006) The Ancient Maya, which is an authoritative archaeological source on this topic. Section (2.1) gives an overview of pre-Columbian Mayan history and political and economic structures. Section (2.2) details relevant aspects of pre-Columbian Mayan cosmological beliefs. Section (2.3) focuses on the role of agriculture and plant life in these cosmological beliefs and also their role in pre-Columbian Mayan political and economic structures.

2.1 Pre-Columbian Mayan History and Political and Economic Structures

What is known as the Mayan area can be divided into three main geographic zones - the southern, central, and northern areas (Martin & Grube 2008:10). The southern area consists of the Pacific coastal plain and southern highlands. The Pacific coastal plain spans the Pacific coast starting in Chiapas, Mexico and spanning through Guatemala and El Salvador (Sharer & Traxler 2006:31). The Pacific coastal plain is a tropical, swampy area where some of the first permanent settlements in Mesoamerican have been found (Sharer & Traxler 2006:31-34). The highlands are just north of the Pacific coastal plain, and consist of mountains, volcanoes, rivers (Sharer & Traxler 2006:34). The highlands have a more temperate climate and developed permanent settlements later than the Pacific coastal plain (Sharer & Traxler 2006:34). The focus of this
study, the lowlands, encompass the central and northern areas. The lowlands span central and northern Guatemala, Belize, and the Yucatán Peninsula in Mexico and have a more varied climate and elevation (Sharer & Traxler 2006:42). The central lowland area consists of a tropical forest with numerous tree species and more rainfall than in the northern lowland areas, which begins in the northern half of the Yucatán and consists of more scrub forests (Martin & Grube 2008:10; Sharer & Traxler 2006:42-49). Figure (2.1) provides a map of these geographic areas with some of their major Mayan sites:

Figure 2.1. Map of geographic zones of the Maya area with major archaeological sites (Image after Martin & Grube 2008:10; edited by author).
There is evidence of pre-Columbian Mayan civilization from as early as 1000 BC to 1500 AD, which changed from “chiefdom-like organizations” to “preindustrial states” over time (Sharer & Traxler 2006:79). However, similar to Greek city-states, pre-Columbian Mayan polities were not unified under one political power (Sharer & Traxler 2006:79). Instead, most polities individually exhibited centralized power that has been argued to be religiously justified, a type of political organization referred to by Mayanist scholars as *divine rulership* (Sharer & Traxler 2006:89). Hieroglyphic texts and archaeological evidence suggest the basis of power of divine rulership was control over religious rituals, which were supposed to ensure access to basic resources such as physical security, food, and water (Dunning, Beach & Luzadder-Beach In Press; Sharer & Traxler 2006:89). Divine rulership also afforded ritual access to elite ancestors who conferred the rights to rule, which was maintained through the maintenance of temples and shrines where rituals were enacted (Freidel & Schele 1988; Freidel & Schele 1990; Ringle 1999; Sharer & Traxler 2006:89; Schele & Miller 1992; Schele & Mathews 1999). The creation of hieroglyphic texts was essential in enacting and commemorating many rituals and conferring the right to rule, as more fully discussed in section (4). Materially though, rulers were often skilled military leaders that secured control over essential resources through warfare with other polities (Golden et al. 2008; Golden & Scherer 2013; Sharer & Traxler 2006:90-91; Webster 2000). Victors of war were often granted tribute payments from other polities of these key resources, prestige, and later in time, incorporation of polities into their own (Golden et al. 2008; Golden & Scherer 2013; Sharer & Traxler 2006:90-91; Webster 2000). Rulers, or kings, titled the ‘*aajaaw*, also had an organized group of elites subordinate to them, or a royal court (Houston & Stuart 2001; Inomata & Houston 2000, 2001; Jackson 2013; Restall 2001; Ringle & Bey III 2001; Sharer & Traxler 2006:89;). For example, Jackson (2013) analyzes the characteristics and
political structure of the royal court in the Late Classic (600-900 AD), through the titles of four elites who were subordinate to the 'aajaaw ‘ruler’ that underwent similar accession processes. These titles are sajal\(^2\), aj k'uhuun, y-aajaaw k'ahk, ti' huun/ti' sak huun, which have not been fully translated, and one that has not yet been deciphered but labeled as the “banded bird” title (Jackson 2013:11)\(^3\). Though there are not straightforward descriptions of these elites’ roles in hieroglyphic texts, context elucidates some of their activities that may have been shared amongst the royal court (Jackson 2013:67). These activities were similar to those of rulers and include ritual activities such as dancing, conjuring and impersonation of deities, fire rituals, the celebration of time period endings, and warfare, and some scribal and artistic production (Jackson 2013:66-67). Other titles, or simply name phrases, for other elites using vocabulary from the semantic domain of TREES are discussed in chapter 4 in order to analyze the use of this domain in metaphorical characterizations of rulership.

The pre-Columbian Mayan economy, like those of most societies, relied heavily on subsistence (Sharer & Traxler 2006:80). In the Mayan area, swidden agriculture still predominates to this day and involves clearing and burning areas for planting crops until these areas are no longer fertile (Sharer & Traxler 2006:81). They are then left to lay fallow while other areas are cultivated (Sharer & Traxler 2006:81). For the Mayan area, the main crops cultivated included maize, beans, and squash (Sharer & Traxler 2006:81). Swidden agriculture only supports low levels of population, so as populations increased, methods for enriching soil began to allow for more frequent cultivation (Sharer & Traxler 2006:81). Swidden agriculture was also maintained through having a dispersed population (Sharer & Traxler 2006:81). A

\(^2\) The title sajal might consist of the root saj ‘to fear’ (as previously noted by Nikolai Grube), that is attested in Motul, and a -\(l\) suffix, (Mora-Marín 2021 personal communication).

\(^3\) See Jackson (2013:66-67) to evaluate the full discussion of these terms.
population spread through a diversity of environments in the Mayan area also allowed for a
diversity of resources and agricultural strategies to be used (Sharer & Traxler 2006:81).

This dispersed population led to the development of trade and markets (Hirth & Pillsbury
2012; Masson & Freidel 2012; McAnany 2010; Sharer & Traxler 2006:82; Tokovinine &
Beliaev 2012). Long-distance trade occurred throughout Mesoamerica generally running east to
west from Central Mexico to Central America, and from north to south from the Pacific coastal
plains to the Yucatán (Sharer & Traxler 2006:84). Everything from food products like cacao and
salt, raw goods such as obsidian, jade, quetzal feathers, and cotton, and crafted commodities like
textiles, and pottery, were traded (Sharer & Traxler 2006:84). Elites likely had control over these
trade routes, allowing them to control a network of other polities (Sharer & Traxler 2006:84).
Further, patrons likely enlisted specialists in the production of prestige goods (Sharer & Traxler
2006:84). There is some debate over whether elites controlled markets, but it is likely elites were
involved at least to some degree in their management (Sharer & Traxler 2006:82). For example,
Masson and Freidel (2012:214) argue that Mayan rulers’ involvement in orchestrating trade is
evident from the presence of foreign goods in commoner households, which would have been
incapable of obtaining these goods except through a central marketplace in the Classic period
(250-900/1100 AD). Further, palace scenes on elite pottery show scribes writing, with large
bundles in the background, seemingly counting some kinds of goods for record-keeping in the
Late Classic period (Stuart 2006a). Elites also likely benefited from tax paid in the form of labor
that was used to maintain political and religious centers or other goods (Sharer & Traxler
2006:85). A word for an extremely ancient practice of this sort is reconstructable for the
Lowland Mayan languages and most of the rest of the Mayan family, from the word *pataan. Its
distribution in all of Mayan except Huastecan demonstrates it must date to at least the Preclassic
period (2000 BC - 250 AD). Kaufman (2017:92) states that the meaning in descendant languages refers to “what you give to or do for a ruler or a community because you owe it to them by virtue of your being of lower status”.

These broad aspects of pre-Columbian Mayan political and economic structures, including subsistence strategies, came into existence over several thousand years of history. Pre-Columbian Mayan history can be roughly divided into the Paleoindian (12/20,000 years ago – 8000 BC), Archaic (8000-2000 BC), Preclassic (2000 BC - 250 AD), Classic (250-900/1100 AD), and Postclassic periods (900/1100-1500 AD). The Paleoindian period largely involved the peopling of the Americas from Asia, including into Mesoamerica (Sharer & Traxler 2006:153). In this period, people formed small groups which subsisted on hunting and gathering over large areas (Sharer & Traxler 2006:154). In the Archaic period, people began to hunt and gather in specified areas, or territories, in year-round or seasonal settlements (Sharer & Traxler 2006:154). Towards the end of this period, people began to rely on a smaller set of foods which they cared for and eventually domesticated, marking the beginnings of agriculture (Sharer & Traxler 2006:154-5). The Preclassic period is distinguished by an increase of settlements, the beginning of pottery production, and complex societies (Sharer & Traxler 2006:155). Towards the middle of this period (1000-400 BC), class distinctions of elites and non-elites and hereditary rulership emerge, the source of later developments of pre-Columbian Mayan civilization (Sharer & Traxler 2006:155). In the later part of the Preclassic period (400 BC – 100AD), writing developed in the Mayan area, though writing is evidenced before this period in other parts of Mesoamerica (Ringle 1999; Sharer & Traxler 2006:155). Additionally, the institution of divine rulership began to develop, which would transform into states in the next period, the Classic period, the focus of this study (Ringle 1999; Sharer & Traxler 2006:155).
The Classic period is segmented into the early (250-600 AD), late (600-800 AD), and terminal (800-900 or up to 1100 AD in certain places) periods (Sharer & Traxler 2006:155). The Classic period was characterized by “large populations, full-time craft specializations, social stratification, and a centralized political authority” that existed predominately in the southern and central lowlands (Sharer & Traxler 2006:155). In the Early Classic, several independent states developed, with two states, Tikal and Calakmul, dominating through warfare and control of trade without completely incorporating other states into their own (Sharer & Traxler 2006:371). In the Late Classic, there was enormous population growth, with an increase in the number and the size of individual polities (Sharer & Traxler 2006:495). This led to increased competition between polities for resources and more conflict, without a single or even handful of polities dominating the area (Sharer & Traxler 2006:495). In the Terminal Classic, several factors, including population pressure on the environment and warfare, led to the abandonment of several polities in the central lowlands (Dunning, Beach & Luzadder-Beach In Press; McAnany & Yoffee 2009; Masson 2012; Sharer & Traxler 2006: 585; Turner & Sabloff 2012). Much of this population moved to the northern lowlands in the Yucatán where another polity, Chichen Itzá, dominated (Sharer & Traxler 2006:585-586). However, Chichen Itzá did so through an emphasis on the trade of utilitarian goods with the rest of Mesoamerica and a decentralized government based on joint rule, as opposed to divine rulership (Sharer & Traxler 2006:585-586). These trends continued and heightened in the Postclassic period, though power shifted to new polities such as Mayapan in the Yucatán, the K’iche’ state in the southern highlands, and the Kan Ek’ polity in the central lowlands ( Masson & Peraza Lope 2014; Sharer & Traxler 2006:626–628). Increased economic prosperity from increased overland trade routes also begot a true mercantile class
(Sharer & Traxler 2006:626-628). It is at the end of the Postclassic period that the colonial period begins with the arrival of the Spanish (Sharer & Traxler 2006:156).

2.2 Pre-Columbian Mayan Cosmology

In pre-Columbian Mayan cosmology, what would be labeled the natural and supernatural worlds in western societies are not distinguished and are both controlled by a pantheon of deities (Sharer & Traxler 2006:719-720). These deities could take forms from the natural world, including animals, or human forms (Sharer & Traxler 2006:719). Further, both people and deities had spirit companions, known as wahy (Sharer & Traxler 2006:719). An order of the world that benefited humans, such as having a good harvest, was maintained through rituals designed to appease deities, discussed throughout the remainder of this chapter (Sharer & Traxler 2006:720).

Much of what is known about pre-Columbian Mayan cosmology and rituals comes from hieroglyphic texts, but a substantial amount of their interpretation rests on colonial era documents. In particular, the K'ichee' Mayan Popol Vuh (Christenson 2007; Mondloch & Carmack 2018; Tedlock 1996) details numerous aspects of a creation story, parts of which are evidenced in pre-Columbian texts, and are further discussed in the next section (2.3). The Popol Vuh attests that there were three previous worlds that were destroyed before the creation of the current world (Christenson 2007; Mondloch & Carmack 2018; Tedlock 1996). The idea of a previous world is attested at the Classic period polity of Palenque in an elaborate narrative labeled ‘The Cross Group Texts’ that is focused on in this study. The narrative traces a lineage of rulers stretching from well before the existence of the polity, any textual records of the lineage or known time keeping in Mesoamerica at all (Sharer & Traxler 2006:728). Details of pre-Columbian Mayan calendrical cycles are discussed in section (4.1).
The pre-Columbian Mayan universe was conceptualized as consisting of three main vertical oriented realms: the earth, the underworld, which had nine layers within it, and the heavens, which had thirteen layers within it (Sharer & Traxler 2006:730). The earth was believed to rest on the back of a reptile that was swimming in the sea and had sacred trees which supported the sky (Sharer & Traxler 2006:730–731). The earth was also believed to be quadripartite in nature, corresponding to the cardinal directions (Sharer & Traxler 2006:730–731). The movement of celestial bodies was conceptualized as moving through these vertical realms and as dying and being reborn as they became invisible and visible in the sky (Sharer & Traxler 2006:731). Humans could enter the underworld and heavens through caves in mountains, which were conceptualized as various supernatural conduits, ranging from trees to reptiles (Sharer & Traxler 2006:731). This structure of the pre-Columbian Mayan universe was replicated in the layout of Mayan polities, with temples and other important architecture aligning with the cardinal directions and replicating the heavens and underworlds, such as at the polities of Copan and Dos Pilas (e.g. Demarest et al. 2003; Sharer & Traxler 2006: 731–732).

There is also evidence of a belief in life after death, where a non-corporeal spirit essence lives on, from hieroglyphic and colonial texts, and archaeological remains (Houston & Taube 2000; Marcus 1978; Sharer & Traxler 2006: 733–734; Taube 2004). Houston and Taube (2000) and Taube (2004) argue that this spirit essence was believed to exist in music, breath, and scents, particularly that of flowers and copal. However, McDonald and Stross (2012) argue that animating life force was based on a primordially monistic watery substance. Archaeological evidence in burials from the polities of Tikal, Copan, Caracol, and others, show ritual use of jade, a precious stone for pre-Columbian Mayan society, in deceased rulers’ mouths (Sharer & Traxler 2006:733). This ritual use of jade suggests the same symbolic connection of breath with
a soul essence and the afterlife since jade is placed where breath leaves the body (Sharer & Traxler 2006:733). Rituals for the deceased did not have an end point per se, with ancestor veneration continuing through generations from pre-Columbian to contemporary times. This is evidenced in burials that were placed close to or below houses of commoners even before the existence of elaborate temples (McAnany 1995; Sharer & Traxler 2006:734). Thus, ancestors, though deceased remained a significant part of society (Sharer & Traxler 2006:734). Finally, knowledge of agricultural cycles was integral to these beliefs about life, death, and the structure of the cosmos, to be discussed in section (2.3).

2.3 Agriculture and Pre-Columbian Mayan Society

Much of pre-Columbian Mayan political and economic structures and cosmologies were centered on the knowledge and significance of various crops and plant life used by pre-Columbian Mayan society. Section (2.3.1) discusses a few of the most symbolically significant crops including maize, section (2.3.2) cacao, section (2.3.3) trees, and section (2.3.4) waterlilies and other flowers.

2.3.1 Maize

Maize was and is a staple food in the Mayan area from pre-Columbian to contemporary times, with the maize cycle used as a central organizing principle in Mayan society (Stross 2009). The K’iche’ Mayan creation story the Popol Vuh demonstrates the cosmological importance of maize, while also providing examples of the importance of maize in pre-Columbian Mayan political and economic structures, kinship, and rituals. The Popol Vuh centers the creation of the world and human beings and their identity upon the creation and use of maize.
(Christenson 2007; Mondloch & Carmack 2018; Tedlock 1996). In the *Popol Vuh*, human beings’ flesh was said to be made from maize kernels, and their blood from water, two things necessary for maize agriculture (Tedlock 1996:146). Further, one of the central storylines of the *Popol Vuh* that involves the maize god, Hun Hunahpu, and his sons, Hunahpu and Xbalanque, expresses several important cosmological principles (Christenson 2007; Mondloch & Carmack 2018; Tedlock 1996). The story proceeds when Hun Hunahpu is killed by the lords of the underworld and his sons try to rescue and resurrect him (Tedlock 1996:141). Before the twins’ journey to the underworld, their grandmother places ears of corn in the center of the house, which will die and wilt if the twin sons also do (Tedlock 1996:139). This symbiosis between the well-being of maize crops and human life is also attested in contemporary Mayan rituals. Stross (2009:587) notes that the Pokomam and Tzotzil Mayan people have a similar ritual in which blood from an umbilical cord of a newborn is dripped on maize and planted in a small milpa, whose success is viewed to be prognostic of the child’s health.

The story of Hun Hunahpu and his twin sons also demonstrates the importance of maize agriculture in concepts of kinship. The twin sons attempt, though fail, to save their father whose head is placed in a calabash tree upon death (Tedlock 1996:141). The twins make up for this failure by assuring him that he will always be prayed to at that tree (Tedlock 1996:141). In Classic Maya depictions of cognate scenes, Hunahpu is successfully resurrected by his twin sons watering him (Stross 2009:591). These stories model how offspring are required to venerate their ancestors. Given that people are said to be made of corn, these stories also show directly how ancestors give their offspring life – through embodying the food staples that sustain people. Kinship is thus not thought of as linear, but cyclical and interdependent between generations.
Further, given that Classic Mayan rulers largely established the right to rule through genealogical descent, these ideas about kinship show parallels to ideas about rulership in pre-Columbian Mayan society, where ancestor rulers were also venerated. Concepts of rulership are also based on the significance of maize, with Classic period Mayan rulers having been purported to enact the role of the maize god, or his twin sons (Taube 1985). Performing as the maize god may have had direct political and economic effects. These performances may have been aggrandizing acts directed at commoners, establishing the divine status of rulers who purported to control the success or failure of maize crops, or as the organizers of trade who would have provided maize in times of drought and famine (Freidel and Reilly 2010).

That the maize cycle may have served as an organizing principle for pre-Columbian Mayan society is also evidenced in Mayan calendar cycles. One interpretation of the ritual calendar of 260 days, termed the *tzolkin* by researchers, that matches 13 numerals against 20 named days, is that it is based upon the maize cycle. For example, Stross (2009:587) notes that in the Mayan language Tzeltal that there are thirteen purported stages of maize growth. Aveni (2001:144) also notes arguments that the *tzolkin* aligns with the planting season. The *tzolkin*’s use for ritual, mainly prognostic, purposes demonstrate how the maize cycle could have been used as a framework to understand and organize other aspects of society, including political ones.

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4 The term *tzolkin* is used here based on standard conventions in Mayan research, but this term was likely not used in any Mayan language to reference the 260-day calendar. For example, Thompson (1950:71) argued, “Gates (verbally about 1921, subsequently in print) suggested that the Maya name for the cycle of 260 days was *tzolkin*, which means literally the counting in order of the days. This word has come into rather general use in recent years despite the fact that Long (1934) has demonstrated that *tzol* is a general word that can be used for any sort of count of days, weeks, or nights and serves both for a reckoning of 365 days and for a count of 260 days. Indeed, Wisdom tells me, the Chorti use *tzohrkin* (shift to Chorti r) for the European calendar! The word should be dropped, for an erroneous term masquerading as the true one is worse than none at all.”
2.3.2 Cacao

Cacao was also a significant crop in terms of political and economic structures, kinship, and rituals (Loughmiller-Cardinal 2019; Martin 2006; McNeil 2006; Reents-Budet 2006; Stuart 2006a; Stuart 2006b; Sharer & Traxler 2006: 84, 633-634; Tedlock 2002). Cacao was highly relevant to Classic Mayan conceptions of wealth (Stuart 2006a). Large quantities of cacao that were transported across Mesoamerica have been argued to be tribute, trade goods, a form of currency, and/or simply part of elite gifting rituals (Stuart 2006a). Cacao held an additional social significance for elites, being mentioned frequently on elite polychrome ceramic vessels (Stuart 2006b). Most interpretations of glyphic spellings of cacao have centered on the literal uses of vessels as containers for cacao beverages (e.g. Stuart 2006b), though Loughmiller-Cardinal (2019) demonstrated that there is no material evidence in the form of chemical residue or useware that these vessels were used for the consumption of a liquid. Significantly, polychrome ceramic vessels that may mention cacao were often given as gifts at ritual feasting events amongst elites (Reents-Budet 2006). Reents-Budet (2006:213) notes that the explosion of the presence of elite pottery labeled for foodstuffs, like cacao, in the Late Classic would have reaffirmed elite social status. Further, there are correlations in the quality of pottery construction and elaborateness of iconography and glyphic texts with social status throughout the Mayan area (Reents-Budet 2006:218). The relationship between ceramic vessels, foodstuffs, and elite identity is discussed in depth in section (4.3) and chapter 6, and is the focus of this study.

It has also been argued that cacao’s cultivation had wider cosmological significance and significance for conceptions of kinship, in addition to its tangible use as a measure of wealth. The polity of Copan in the Late Classic period provides a key example. In the Late Classic at Copan, there is a prevalence of cacao groves not found in the rest of the Mayan area and also a
prevalence of incensarios with cacao iconography that has been found in ritual caches and burials (McNeil et al. 2006). Cacao has also been used as ornamentation on depictions of various entities indicating it was significant for social identity (McNeil et al. 2006). Some of the cacao incensarios also depict ‘world trees’ that commonly believed structure space in Mayan cosmologies, discussed more in section (2.3.3) (McNeil et al. 2006:245). However, there are no polychrome ceramics with glyphic texts referencing cacao, as just discussed and as is common in other Mayan areas (McNeil et al 2006:251). This indicates different social uses of cacao at Copan (McNeil et al 2006:251). McNeil et al. (2006:250) suggest that the prevalence of cacao orchards in the region may have led to the association of cacao with lineages through their long-term care and investment in the orchards, as opposed to an association with kinship simply due to the wealth of cacao that was maintained through families, which is further discussed in section (2.3.3).

Martin (2006) has similarly addressed cacao’s cosmological significance and its significance for conceptions of kinship, based on its cultivation. Martin (2006) examines cacao iconography from the Early – Postclassic periods and notes a fusion of cacao iconography with maize. Particularly, Martin (2006:165) views a scene from a pottery vessel (vase K5615) as cognate with the scene from the *Popol Vuh* discussed in the previous section (2.3.1) in which the maize god’s head is placed in a calabash tree after death. In this vessel though, Martin (2006:165) argues the tree is a cacao tree. This example clearly shows cacao’s cultivation also had significance in understandings of kinship like the cognate scene in the *Popol Vuh*. This example, and other examples of cacao trees, are subject to a more detailed discussion in chapter 5 and chapter 6.
2.3.3 Trees

Apart from cacao, trees generally held significance for political and economic structures, kinship, rituals, and cosmology in pre-Columbian Mayan society. This makes sense given that the height of creation of Classic Mayan texts was in the southern lowlands, an area filled with rich tropical forests, as mentioned in section (2.1). The subject of this study is one particular symbolic use of trees in conceptualizations of royal lineages, which will be further elaborated in the following chapters, but is briefly discussed here. In particular, orchards of trees held symbolic significance for concepts of lineages. McAnany (1995) details this relationship, focusing on connections between agricultural practice and ancestor veneration from pre-Columbian to colonial times in the Mayan area. McAnany (1995) notes that land rights, particularly to agricultural lands, were inherited. Orchards specifically required long-term investment, with trees needing to be planted and cared for by older generations in order for these trees to eventually grow to produce in future generations. McAnany (1995) argues that this system of inheritance led to a particular metaphor for lineages seen in the iconography at the Classic period polity of Palenque, discussed at length in the rest of this study. In this metaphor, which this study labels RULES ARE TREES, ancestors give life to the next generation through the produce of orchards while embodying these orchard trees themselves. This conceptualization is related to the symbolic significance of maize discussed in section (2.3.1) above, where subsistence through agriculture is used to conceptualize the relationships held through kinship and lineages. In fact, it was also noted that maize’s symbolism intimately relates to produce-bearing trees. McAnany (1995) also notes that these orchards were close to household units, where burials and shrines of ancestors were also located. McAnany (1995:99-101) argues these burials and shrines were believed to be protective of the living inhabitants, but more importantly
provide a “genealogy of place”, or a record of land rights for a given lineage. Maintaining these shrines through ancestor veneration rituals helped maintain these rights (McAnany 1995:99-101).

Other symbolic uses of trees include those in cosmograms, often labeled ‘world trees’. There is a long tradition of using these world trees to demark various regions of cosmological space, which is often depicted in a quincunx, with four sections corresponding to the cardinal directions and a center point (Bassie-Sweet 2008; Knowlton & Vail 2010: 711–712; Miller & Taube 1993). These ‘world trees’ are also usually associated with calendrical year bearers (a set of four day names out of twenty day names that can start the new year), in addition to specific birds or animals, colors, and deities (Knowlton & Vail 2010: 711–712; Miller & Taube 1993; Saturno 2006; Taube 1988; Thompson 1972). Broadly then, these ‘world trees’ represent the *axis mundis* and their association with year bearers represents their essential role in setting up both space and time (Vail 2010:711). The pre-Columbian Mayan calendar system will be discussed more fully in section (4.1). ‘World trees’ were also regarded as cosmological conduits for communication and perhaps celestial travel (Taube 1993; Bassie-Sweet 2008; Knowlton & Vail 2010: 712). The central tree of the quincunx has often been labeled as *yaaxtee* ‘blue/green, ceiba tree’, likely referring to the ceiba tree which is distinguished by the thick thorns on its trunk (Knowlton & Vail 2010:712). However, not all depictions of this tree are specifically identifiable as ceiba trees (Knowlton & Vail 2010:712), discussed further in chapter 5. Some have strongly argued that pre-Columbian Mayan rulers embodied such world trees (Freidel, Schele & Parker 1995) and others more weakly (Houston & Cummins 2004). Though this study does not fully evaluate these arguments, it provides some evidence that pre-Columbian Mayan rulers were not necessarily conceptualized as ‘world trees’ in chapter 5.
Trees are symbolically significant in depictions of stelae, tall stone monuments that detail lengthy genealogical records of royal lineages. Stuart (1996a) rejected a previous reading from Schele and Stuart (1986) where hieroglyphs referring to stelae were translated as ‘stone-trees’. However, the Madrid codex depicts trees with writing, which may be stelae, as seen in figure (2.2):

![Figure 2.2. Tree with hieroglyphic writing (Codex Madrid - Brasseur de Bourbourg and Léon de Rosny (1883:90); photo courtesy of Ancient Americas at LACMA (ancientamericas.org)).](image)

This may be because the paper of codices was made of tree bark, specifically from a fig tree, *amate* (Aveni 2001:170; Vail 2006). However, the content of such writing may relate stelae to trees because stelae were intimately part of ancestor veneration (Stuart 1996a).

### 2.3.4 Waterlilies and Other Flowers

The strong role of flower symbolism in Mayan and Mesoamerican art has recently been argued for by Taube (2004; 2010). Like maize, flowers have been argued to structure understandings of human life and like trees, structure understandings of space. Flowers were viewed as having life-giving forces since flowers provide sustenance for many animals (Taube 2010:165). Given this, flowers were also viewed as representing *ch'uhleeel* that enabled a human
life force, or one’s soul, to exist (Taube 2010:165). Citing Tzotzil ethnography, Taube (2004:70-72) contends that this life force, or soul, is understood to be the *ch’uhleel* or ‘god/holy’ part of a person that goes on to heaven after death. Further, the aroma of flowers is often used to describe the breath or life force of a human (Taube 2004:72). This *ch’uhleel* life force is to be contrasted with *wahy* spirits, which in Tzotzil society are supposed to rule impulsive, animalistic behavior and leave the person at death (Taube 2004:70-72). *Wahy* spirits are frequently found on Classic Mayan vessels engaging in such kind of behaviors (Taube 2004:70-72). *Wahy* spirits, however, also give one their personality and individuality (Taube 2004:70-72). Classic Maya stelae frequently reference *wahy* spirits as status symbols for a mentioned ruler (own observation).

Taube (2004) also argues for flowers’ roles in understandings of space by examining Mesoamerican and Southwestern art from the Preclassic to Postclassic. First, Taube (2010:79-86) contends flowers are representative of ‘flower mountain’, a heavenly paradise of lush gardens with sweet-smelling flowers for the deceased. Second, Taube (2010:174-175) contends flowers, like trees, are conduits to unearthly realms. Specifically, serpent conduits are often depicted going through flowers (Taube 2010:174-175). Flowers may be depicted on these serpents as well (Taube 2010:174-175). Related, flowers are often depicted at the intercardinal directions through which the ecliptic is placed (Taube 2014:165). Flowers are also conceptualized as bowls given their portal-like shape and (Taube 2014:165).

In contrast to Taube (2004; 2010), McDonald and Stross (2012) claim the significance of the waterlily in pre-Columbian Mayan cosmology and politics has been and still is underestimated. McDonald and Stross (2012) claim the waterlily is a unifying cosmological principle for Late and Postclassic Mayan societies. Waterlilies are associated with the primary cosmological substance that animates all things in the Mayan world. Waterlilies first and
foremost symbolize the unbound ‘watery’ substance that was bound by the first creator deities to create space, as told in the *Popol Vuh* (Tedlock 1996:64). The glyph for the first day sign in the tzolkin, ‘*imiix*’, is visually similar to the hieroglyphic sign for ‘waterlily’ *naHb’*, which also means ‘lake’ (McDonald & Stross 2012:80). The days in tzolkin have been argued to represent and proceed in some way similar to the events of creation (McDonald & Stross 2012:80). Waterlilies can also represent this animating substance in human life forms, often referred to in glyphic descriptions as *sak nich* ‘white flower’, though some argue this represents other flowers (McDonald & Stross 2012:81). The primordial associations of waterlilies allow them not only to represent life, but also death and the underworld, being the antithesis of all created things. Waterlilies are also characteristically seen in depictions of the underworld, and their residents, like jaguars (McDonald & Stross 2012).

Waterlilies might also have more implications for Mayan political structure than previously believed. Many Classic Mayan rulers have the word *naHb’* as part of their name (McDonald and Stross 2012:88). Further, waterlilies have also been noted for their hallucinogenic properties when consumed and this use has been noted in a few iconographic examples from bowls (McDonald & Stross 2012:94; Zidar n.d.). Further, drops of liquid or small granular solids from depictions of ritual bloodletting scenes on stelae may be water, flowing directly from waterlilies (McDonald & Stross 2012:98). This interpretation is not implausible, given depictions of conjuring of ancestors from the watery underworld that usually accompanies such bloodletting scenes. Waterlilies could thus be of importance in a political ritual context and for the maintenance of kinship relationships.

Further, waterlilies may have had political significance because of their role in ensuring material security and thus political control by elites. Lucero (2002) and Dunning et al. (in press)
note the need to control and keep water resources in reservoirs sanitary in an area with strictly seasonal rainfall, such as at many Late Classic Mayan polities. Lucero (2002) notes that rulers would have gained substantial political power through managing water resources. Waterlilies only grow in certain conditions, one of which is clean water, thus providing impetus for their use as a symbol of control of uncontaminated water (Lucero 2002:815).

3 Multimodality and Mayan Hieroglyphic Texts

This section provides a general discussion of the multimodal qualities of Mayan hieroglyphic texts and the communicative affordances provided by this multimodality. Section (3.1) provides an overview of the structure and history of Mayan languages, given that Mayan hieroglyphic writing represented a Mayan language, specifically of the Greater Tzeltalan language family. Section (3.2) provides an overview of the structure of Mayan hieroglyphic writing and how this study will transliterate, transcribe, gloss, and translate examples of Mayan hieroglyphic writing. Section (3.3) provides an overview of the relationship between pictorial images and Mayan hieroglyphic writing in Mayan hieroglyphic texts. It also details what communicative affordances are provided by the way these two modalities, writing and pictorial images, relate in Mayan hieroglyphic texts.

3.1 Mayan Languages & Hieroglyphic Texts

The Mayan language family consists of thirty languages, two of which are no longer spoken (Kaufman 2017:63). The Greater Tzeltalan language subgroup is believed to be what is largely represented in Mayan hieroglyphic texts. There is debate over the groupings of some Mayan languages, though most scholars accept the proposal by Kaufman and Norman (1984)
(e.g. Campbell 2017:45; Mora-Marín 2009a:125). In this proposal, the Greater Tzeltalan language family split off to become its own branch around 200 BC around the first attestation of Mayan hieroglyphic writing from the site of San Bartolo (Saturno 2005; Saturno, Stuart & Beltrán 2006) and further broke off into the two branches of Tzeltalan and Ch'olan around 600 AD (Kaufman & Norman 1984; Kaufman 2017:67). The Tzeltalan language family consists of the languages Tzeltal and Tzotzil while the Ch'olan language family consists of Ch'ol, Yokot'an (Chontal), Ch'orti', and the now extinct Ch'olti' (Kaufman & Norman 1984; Kaufman 2017:66). The Ch'olan languages later split off into a western branch, consisting of the Yokot'an (Chontal) and Ch'ol varieties, and an eastern branch, consisting of the Ch'orti' and Ch'olti' varieties (Kaufman & Norman 1984; Kaufman 2017:66). The divergence of the Ch'olan language family into its western and eastern branches did not begin to occur until 600 AD in the Late Classic (Kaufman 2017:66; Mora-Marín 2009a).

An alternative proposal by (Robertson 1998) argues for a different grouping of Mayan languages. Relevant here is the argument that there was not a distinct western and eastern branch for the Ch'olan language family and that Ch'olti' was a direct ancestor of Ch'orti' (Robertson 1998). Stemming from this proposal is that by Houston, Robertson, and Stuart (2000) who argue the language of the Classic period hieroglyphic texts is written in the claimed ancestor of colonial Ch'olti' which they label ‘Classic Ch'olti'an’. Mora-Marín (2009a) persuasively argues that evidence used in the ‘Classic Ch'olti'an’ hypothesis rests on linguistic features that were actually shared retentions from Proto-Greater Tzeltalan and Proto-Ch'olan and that the language of the Classic period hieroglyphic texts was some form of Pre- or Proto-Ch'olan, where Pre-Ch'olan is the descendant of Proto-Greater Tzeltalan that emerged before Proto-Ch'olan. However, linguistic variation is evident in the Classic period, providing promising evidence for
the beginnings of dialect or register differentiation. For example, there is geographic and
temporal variation in the use of positional verb markers -wan and -laj (Hruby & Child 2004;
Kaufman & Norman 1984; Lacadena & Wichmann 2006; Mora-Marín with Wiesen 2019), as
well as with the prepositions ti and ta (Macri 1986, 2021), the variants of the prevocalic third
person ergative markers y- and uy- (Mora-Marín with Wiesen 2019), and the variants of the
abstractive suffix -(VV)l-iil/(VV)l-aal and -(VV)l-eel (Mora-Marín with Wiesen 2019). Further,
though Mayan hieroglyphic texts were primarily written in some form of Ch’olan or pre-Ch’olan,
numerous scholars have noted the presence of Yucatecan language traits from Yucatecan
speaking scribes (Bricker 1986; Justeson et al. 1985; Justeson & Fox 1989; Lacadena 1997;

Mayan hieroglyphic writing attests most grammatical features of Ch’olan languages,
though not all are represented due to the genre of the texts and linguistic change. The language of
Mayan hieroglyphic writing is head-initial, head-marking, morphologically agglutinating, and
has ergative-absolutive alignment where the grammatical agent and patient are morphologically
marked on transitive verbs, as opposed to the subject and object (Mora-Marín 2009a:124).
Though a split-ergative system with an aspectual split is found in contemporary Ch’olan and
Yucatecan languages, there is not clear evidence for this system in Mayan hieroglyphic texts
(Mora-Marín 2016:124–125). In this split system, verbs in incompletive aspect are marked in a
nominative-accusative alignment and those in completive aspect are marked in an ergative-
absolutive alignment (Zavala Maldonado 2017). Obliques could be expressed by prepositions or
hieroglyphic writing exhibits a VOA (verb object agent) and VS (verb subject) word order,
though focused or topicalized orders of AVO and OVA also occur (Bricker 1986; Law & Stuart
2017:135; Mora-Marín 2009a:124; Schele 1982). Non-verbal predicates also occur in the initial position as well (Bricker 1986; Law & Stuart 2017: 134). Despite these word order alternatives, there is a preferred argument structure in which only one nominal argument per clause is expressed, and that argument usually takes on the intransitive subject role, as opposed to the agent or object (Mora-Marín 2004a). There are several valence changing affixes including inchoatives, versives, passives, mediopassives, antipassives, applicatives, and causatives, some of which may be used to adhere to this preferred argument structure (Mora-Marín 2016: 124–125; Law & Stuart 2017: 149–153). There are also several kinds of verb and noun classes (Law & Stuart 2017: 146–167). Other aspects of morphology and syntax are discussed when relevant throughout the remainder of this study.

Most lexical roots have a CVC (consonant vowel consonant) shape, and most affixes a V, CVC, VC, or CV shape (Mora-Marín 2010b:122). Possible syllable shapes include CV (with a short vowel), CVC (with a short vowel), CVV (with a long vowel), CVjC (where [j] is a voiceless velar fricative), CVhC (where [h] is a voiceless glottal fricative), and CV'C (where ['] is a voiceless glottal stop) (Kaufman & Norman 1984; Lacadena & Davletshin 2013; Mora-Marín 2010b:122). However, distinctions based on vowel quality (V, VV, V', Vj, Vh) disappeared over time, eventually only leaving V, Vj, and Vh as possible syllabi nuclei (Kaufman & Norman 1984). A key feature of the phonemic inventory, or sound system, was a contrast between plain stops and affricatives and glottalized ones (Law & Start 2017:139) – the glottalized stops including both implosive b' and ejectives. A phonemic inventory of the sound system is presented below in tables (2.1) and (2.2):
Table 2.1. Inventory of consonant phonemes in Mayan hieroglyphic writing based on (Kaufman & Norman 1984:85–87 and Law & Stuart (2017:139-140).

<table>
<thead>
<tr>
<th></th>
<th>Bilabial</th>
<th>Alveolar</th>
<th>Alveopalatal</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
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<tbody>
<tr>
<td><strong>Stop (plain)</strong></td>
<td>p</td>
<td>t</td>
<td></td>
<td>k</td>
<td></td>
<td>' (ʔ)</td>
</tr>
<tr>
<td><strong>Stop (ejective)</strong></td>
<td>p', b' (ɓ )</td>
<td>t'</td>
<td></td>
<td></td>
<td>k'</td>
<td></td>
</tr>
<tr>
<td><strong>Affricate (plain)</strong></td>
<td>tz (ts)</td>
<td>ch (tʃ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Affricate (ejective)</strong></td>
<td>tz' (ts')</td>
<td>ch' (tʃ')</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fricative</strong></td>
<td>s</td>
<td>x (ʃ')</td>
<td>j (x')</td>
<td>h</td>
<td></td>
<td></td>
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<tr>
<td><strong>Nasal</strong></td>
<td>m</td>
<td>n</td>
<td></td>
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<tr>
<td><strong>Approximant (glide)</strong></td>
<td>w</td>
<td></td>
<td>y (j)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Approximant (lateral)</strong></td>
<td>l</td>
<td></td>
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</tr>
</tbody>
</table>

Table 2.2. Inventory of vowel phonemes in Mayan hieroglyphic writing and for Pre-Ch'olan based on Kaufman & Norman (1984:84-67) & Law & Stuart (2017:139-140).

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Central</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td>ii [i:]</td>
<td>i</td>
<td>uu [u:]</td>
</tr>
<tr>
<td></td>
<td>i</td>
<td></td>
<td>u</td>
</tr>
<tr>
<td><strong>Mid</strong></td>
<td>ee [e:]</td>
<td>e</td>
<td>oo [o:]</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td></td>
<td>o</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>aa [a:]</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (2.1) gives a phonemic inventory for consonants and table (2.2) gives a phonemic inventory for vowels. Table (2.1) and (2.2) are written in the orthography developed by the Academia de Lenguas Mayas de Guatemala (ALMG) for Mayan languages. When this differs
from the International Phonetic Alphabetic (IPA), the IPA symbol is given in parentheses. For table (2.1) Kaufman and Norman (1984:87) reconstruct *[p'] to Proto-Ch’olan, but Law and Stuart (2017: 140) note that it is unclear whether the sound [p'] is represented in the Mayan hieroglyphic script. Further, Kaufman and Norman (1984:85) note that the contrast between long and short vowels present in Greater Tzeltalan was eliminated in Proto-Ch'olan, except in the case of phonemes /aa/ and /a/. The phoneme /aa/ was phonetically [a:] and the phoneme /a/ was phonetically [ä] except when followed by a glottal stop, in which case it was phonetically [a]. When vowel length was lost throughout the system, the phonetic contrasts between some pairs of words with /aa/ and /a/ were now distinctive instead of allophonic and predictable (Kaufman & Norman 1984: 85). Following Kaufman and Norman’s (1984) model, the distinction between [a] and [ä] would not have been written in Mayan hieroglyphic texts. However, in Robertson’s (1998) model, long vowels would have been present in Proto-Ch'olan. There are also differences of opinion in whether these vowel contrasts would have been represented in Mayan hieroglyphic texts (Houston, Stuart, Robertson 1998; Kaufman with Justeson (2003); Lacadena & Wichmann 2004; Mora-Marín 2010b), discussed in the next section (3.2). Further, it is possible the feature of long vowels was utilized in spoken discourse during the time period when earlier Mayan hieroglyphic texts were written, but this is not represented in the script either. Although his study agrees with Kaufman and Norman’s (1984) model, transcriptions of spellings from hieroglyphic examples will be in their Pre-Ch'olan forms based on Kaufman and Norman’s (1984) model to allow readers to review examples in with contrastive vowel length, as listed in table (2.2). Pre-Ch'olan forms also distinguish syllables with /VV/ from /V'C/, which eventually merge to /VV/. Pre-Ch'olan vowels correspond to that given in table (2.2).
3.2 Hieroglyphic Writing

Mayan hieroglyphic writing is a logosyllabic system consisting of logograms, which represent morphemes and words, and syllabograms, which represent a syllable (Macri & Looper 2013:31-33; Macri & Vail 2009:13-16). Words can be spelled using solely logograms or solely syllabograms, but verbs are commonly spelled with a mixture of both and nouns commonly spelled with logograms alone (Macri & Looper 2013:31-33; Macri & Vail 2009:13-16). Syllabograms can be used to spell grammatical affixes, but also are commonly used as phonetic complements to a logogram where the syllabogram may act as a reminder or determine the reading of a logograph, especially if a logograph is polyvalent, or function as part of the visual design of a text (Macri & Looper 2013:31-33; Macri & Vail 2009:13-16). Since almost all words end in a consonant, the use of syllabograms with a CV shape necessitates a seeming over or under-spelling of words (Macri & Looper 2013:31–33). The terms over-spelling and under-spelling are used to describe conventions of Mayan hieroglyphic writing, but it is noted that Mayan scribes would likely not have viewed these conventions as deficient, or as spelling words inaccurately. These attributes of Mayan hieroglyphic writing are seen in the following examples\(^5\) (2.1-2.2):

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\(^5\) The notational system used to transliterate, transcribe, gloss, and translate are discussed at the end of this section in table (2.3).
In example (2.1), the syllabogram <cha> acts as a phonetic complement to the logogram <CHAN> ‘snake’ by repeating its first two sounds but is unpronounced. In example (2.2), only the syllabograms <hu> and <na> are used to spell the word *huun* ‘paper, book, headband’, but the last vowel of the syllabogram <na> is unpronounced and the example is thus over-spelled.

Semantic determinatives can also distinguish the referent of a logogram by marking its semantic class when a logogram has multiple values, such as with cartouches that mark a logogram as being a day sign (Kettunen & Helmke 2020:20). Diacritic markers of two dots
signify the doubling of a sign in pronunciation (Kettunen & Helmke 2020:20). Examples of these are seen in examples (2.3-2.4):

(2.3)

<table>
<thead>
<tr>
<th>IK</th>
<th>IK</th>
</tr>
</thead>
<tbody>
<tr>
<td>'ik'</td>
<td>'ik'</td>
</tr>
<tr>
<td>wind</td>
<td>wind</td>
</tr>
<tr>
<td>'wind'</td>
<td>‘Day sign ‘wind’”</td>
</tr>
</tbody>
</table>

(Image and transliteration from Kettunen & Helmke 2020:20).

(2.4)

<table>
<thead>
<tr>
<th>ka-kak-wa</th>
</tr>
</thead>
<tbody>
<tr>
<td>kakaw</td>
</tr>
<tr>
<td>cacao</td>
</tr>
<tr>
<td>‘cacao’</td>
</tr>
</tbody>
</table>

(Image and transliteration from Montgomery & Helmke 2007).

In example (2.3), the uses of the logogram <IK> 'ik' to reference the value ‘wind’ is shown in contrast to its use to reference its value as a day sign, distinguished by the cartouche around it. In example (2.4), two dots are placed in the top left corner by the syllabogram <ka>, indicating it should be repeated twice when pronounced. It is again over-spelled, with the final vowel of the <wa> syllabogram unpronounced.
There has been debate over what determines the selection of a given vowel in a syllabogram when it is unpronounced. Much of the time, the unexpressed vowel simply matches, or is synharmonic, with the root vowel of the word, as seen in example (2.4) above. In example (2.4), the final unpronounced vowel of the <wa> syllabogram matches the previous vowel of the syllabogram <ka>. Other times though, the vowel may be disharmonic, or not match the root vowel, as seen in example (2.2). In example (2.2) above, only the syllabograms <hu> and <na> are used to spell the word *huun* ‘paper, book, headband’, and their vowels do not match.

Proposals by Houston, Stuart, and Robertson (1998) and Lacadena and Wichmann (2004), argue that when an unpronounced disharmonic vowel is used it signifies that a root has a complex vowel nucleus, such as a V (short vowel), VV (long vowel), Vh (where [h] is a voiceless glottal fricative), or V’ (where [’] is a voiceless glottal stop)\(^6\). However, Kaufman with Justeson (2003) and Mora-Marín (2010b) argue that disharmonic spellings are based on typical patterns of suffixing with a given root. Specifically, the vowel that is used in such suffixing is used even when the suffix is not being spelled (Kaufman with Justeson 2003). Additionally, Justeson (1989) and Mora-Marín (2010b) suggest these spellings may partially be based on phonological conditioning where final consonants are deleted. This study follows these approaches, where disharmonic spellings are not indicators of complex vowel nuclei, in examples throughout this work.

Mayanist epigraphers have used varied sign typologies, but this chapter will only review Macri and Looper’s (2013) and Mora-Marín’s (2020a) typologies, due to space.

Signs that refer to the same value, whether a word or syllable, are visually similar, and from the same source have been labeled as *graphemes* and their related visual variants as *allosigns* (Macri

---

\(^6\) Lacadena & Wichmann (2004) specifically argue that preconsonantal [h] is not represented by any synharmonic or disharmonic spelling pattern.
& Looper 2013; Mora-Marín 2020a). Graphemes that are visually different and from a different source, but reference the same value, have been labeled *allographs*, which is sometimes used interchangeably with the term *allograms* (Mora-Marín 2020a). This contrast is seen in examples (2.5-2.6).

(2.5)

| 'OCH |
| 'ooch |
| to.enter |
| ‘to enter’ |

(Image and transliteration from Montgomery & Helmke 2007).

(2.6)

<p>| ja |</p>
<table>
<thead>
<tr>
<th>ja</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syllabogram &lt;ja&gt;</td>
</tr>
</tbody>
</table>

(Image and transliteration from Montgomery & Helmke 2007).

Example (2.5) shows two logograms that might be labeled *allograms* since they have the same value of <'OCH'> 'ooch ‘to enter’ but are visually distinct, depicting a rattlesnake tail and a hand holding a celt, respectively, and are thus likely of a different origin. In contrast, example (2.6) shows four variations of the syllabogram <ja> that might be labeled as *allosigns*. The four
instances of <ja> vary in whether they have cross-hatching and if they depict a full, or half, crescent shape.

Mayan hieroglyphs, whether logograms or syllabograms, are usually joined together in what is called a glyph block that is visually demarcated from adjacent glyph blocks. Glyph blocks typically represent a single word, though words can be spelled across glyph blocks or represent several words (Macri & Looper 2013:31-33; Macri & Vail 2009:13-16). Glyph blocks can be formed by placing a given grapheme at the top or bottom, left or right sides, or even infixed inside another glyph, or by blending and conflating features of two graphemes. A glyph block is generally read starting from the top left corner, from left to right, and top to bottom. The reading order in entire texts is also from left to right and top to bottom. This reading order is demonstrated in examples (2.7-2.8):

(2.7)

<table>
<thead>
<tr>
<th>YUWAL-’u-ti</th>
</tr>
</thead>
<tbody>
<tr>
<td>yuuwal ’uht-i-Ø⁷</td>
</tr>
<tr>
<td>and.then to.happen-CMPL-3SG.ABS</td>
</tr>
<tr>
<td>‘And then, it happened (got finished)’</td>
</tr>
</tbody>
</table>

(Image and transliteration from Montgomery & Helmke 2007).

---

⁷ Note, ’uht ‘to get finished, to happen’ is the mediopassive form of ’ut ‘to finish’.
Examples (2.7-2.8) show the verb 'uht ‘to happen’ in two different grammatical contexts and its spelling in a different arrangement within its glyph block. In example (2.7), the <'u> and <ti> syllabograms are arranged vertically with the logogram <YUWAL> yuwal ‘and then’ in front of them, while in example (2.8) they are arranged horizontally with a syllabogram <ya> placed below them.

Graphemes can be visually categorized as depicting animals, birds, human body parts, persons, supernaturals, and broadly abstract designs, which are usually formed in an elongated or square shape (Macri & Looper 2013:23-25; Macri & Vail 2009:13-16). Some signs refer to what they visually depict, but many graphemes’ values are based on the rebus principle where what is visually depicted in a grapheme represents a word completely, or nearly, homophonous with a sign’s value (Macri & Looper 2013:26; Macri & Vail 2009:13-16). Visual designs of a given grapheme have changed over time, and several visual processes have been identified. For example, Lacadena (1995) explained that the overall shape of a grapheme could change over time, that it could be blended or conflated with another grapheme, could be repositioned and

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8 How to gloss the syllabic sign <ya> in such a context is unclear, but when used in this context it seems to have a meaning of ‘since’.
rotated, and design elements could be added and/or deleted⁹. Mora-Marín (2020a, 2016, 2003) has documented additional processes such as the splitting of designs (as opposed to conflating), compacting designs, simplification of designs, and horizontal flipping versus rotation.

To capture these features of Mayan hieroglyphic writing, this study uses a specific format to transliterate, transcribe, gloss, and translate a given example of Mayan hieroglyphic writing, as demonstrated in the above examples. Images of hieroglyphic writing occur in the first line when available. Transliterations into the roman alphabet are in the second line in **bold** font, with logograms in **CAPS** and syllabograms in **lowercase**. Individual graphemes of a given glyph block are separated by a hyphen <->. Transcriptions are in the third line and give the phonemic reading of an example in its Pre-Ch'olan form so a reader can view an example with contrastive vowel length. The transcription also marks affixes with a hyphen < - > and clitics with an equal sign < = > in accordance with the Leipzig Glossing Rules. Transliterations and transcriptions are written in the orthography developed by Academia de Lenguas Mayas de Guatemala (ALMG) for Mayan languages presented in tables (2.1) and (2.2) above. The linguistic gloss is given in the fourth line and provides the grammatical categories, functions, and/or English meaning of each affix, clitic, or root. The translation is given in the final line. Translations will include both the literal and metaphorical senses, when applicable. Additionally, for in-text citations of a given term, translations will list all the senses of a given word unless only a specific sense is being referenced in the immediate context discussed, or as noted otherwise. Table (2.3) lists the abbreviations used for the linguistic glosses in this study:

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⁹ Eric Thompson (1950) provided the earliest discussion of this topic.
Table 2.3. List of grammatical symbols for linguistic glosses.

| 1 – first person | MASC – masculine |
| 2 – second person | NOM – nominalizer |
| 3 – third person | PL – plural |
| ABS – absolutive case | PREP – preposition |
| ABSTR – abstractive | POS – positional root |
| AG – agentive | POSS – possessive class |
| CMPL – completive aspect | PRF – perfective aspect |
| DEM – demonstrative | PRS – present |
| ERG – ergative case | PST – past |
| EXT – existential | PSV – passive |
| FEM – feminine | SG – singular |
| FUT – future | VERS – versive |
| INCH – inchoative | VL – [-Vowel] suffix |
| INTR – intransitive (noun incorporation) | |
| INSTR – instrumental | |

3.3 Pictorial Images & Multimodality

Scholars have long noted the complex multimodality of Mayan hieroglyphic texts, that intricately relates the modalities of writing and pictorial images. In fact, it is this complex multimodality that both hindered and helped progress the decipherment of Mayan hieroglyphic writing. Some of the earliest scholars failed to document the visual features of the script accurately, unable to fully perceive the details of what they saw (Coe 1992). Even with accurate reproductions of hieroglyphic texts many scholars erroneously concluded that solely logographic signs and pictorial images were represented in Mayan hieroglyphic texts, particularly given their visual similarity (Kelly 1962). In this view, it was argued that hieroglyphs could not be phonetically based, representing the speech sounds of a language (e.g. Thompson 1950, 1962). Many early attempts to show that Mayan hieroglyphs were phonetically based failed or were unacknowledged (e.g. Rosny (1876); Thomas (1888)), until Knorozov’s (1952, 1967) work. Knorozov’s (1952, 1967) used these texts’ complex multimodality to confirm that Mayan
hieroglyphs were phonetically based, by noting the relationship between pictorial images and recurring hieroglyphic signs. First, though, Knorozov (1952, 1967) compared a colonial rendition of some syllabograms by the Spanish bishop Diego de Landa, labeled ‘Landa’s alphabet’, and knowledge of the Yucatec Maya language, to Mayan hieroglyphic writing. Knorozov (1952, 1967) confirmed his decipherments by noting that what is depicted in pictorial images was what was labeled or named in accompanying writing. For example, Knorozov (1952, 1967) noted that above a pictorial image of a turkey there were the syllabograms <ku-tzu> and that the word for ‘turkey’ in Yucatec is $k\ddot{u}utz$, as diagrammed in figure (2.3):

![Figure 2.3. One of Knorozov’s decipherments from the Madrid Codex (Codex Madrid - Brasseur de Bourbourg and Léon de Rosny (1883:91), based on a diagram by Kettunen and Helmke (2020: 11); photo courtesy of Ancient Americas at LACMA (ancientamericas.org).](image)

Knorozov (1952, 1967) not only confirmed previous hypotheses that Mayan hieroglyphic texts were phonetically based, but also confirmed that the texts had clearly demarcated areas for writing and pictorial images, which served as communicative complements to each other. Though the distinction between writing and pictorial images was useful for decipherment and other scientific questions, pre-Columbian Mayan society likely did not use this distinction. Hieroglyphic texts attest one word $tz\ddot{i}h$ for both ‘writing’ and ‘painting’. This term suggests
that the material act of creating a given text was at the root of pre-Columbian Mayan understanding of them. This term also makes sense, given that the modalities of writing and pictorial images seem to blend at times in Mayan hieroglyphic texts and that logograms were also used in Mayan iconography (Bassie-Sweet & Hopkins 2019:141-151; Stone & Zender 2011:11). For example, though demarcated areas for writing rested on the border of many texts, hieroglyphic captions were often embedded inside the scenes of pictorial images that may clarify or identify who or what is being discussed in the main text at the borders (Bassie-Sweet & Hopkins 2019:151-159; Stone & Zender 2011:24-28). This embedding is distinct from most Western traditions, where captions are regarded as being ‘outside of’ a pictorial image (Stone & Zender 2011:27). Further, given the iconographic nature of many hieroglyphic graphemes, they could be used as such and be embedded in pictorial images that represented individual portraits or entire scenes (Bassie-Sweet & Hopkins 2019:141-151; Stone & Zender 2011:12, 17-19). These may have served as mnemonic devices for oral recitations of a story or information depicted in a given pictorial image (Stone & Zender 2011:15). Common uses of such hieroglyphic graphemes include labeling places, people, and objects (Bassie-Sweet & Hopkins 2019:141-151; Stone & Zender 2011b:24-28;). An example of a layout of a text is given in figure (2.4):
Figure 2.4. Examples of hieroglyphs embedded in a pictorial image, used as writing, circled in orange, and used as iconography, circled in green (Drawing of the Temple of the Foliated Cross, Palenque, by Linda Schele © David Schele (2000:SD-172); photo courtesy of Ancient Americas at LACMA (ancientamericas.org)).

Figure (2.4) shows hieroglyphs embedded in a pictorial image to varying degrees. Those circled in orange are used as writing with a clear reading order, with the leftmost set acting as a caption for the scene, and the leftmost labeling a shell. Those circled in green appear to be used iconographically and embedded in a depiction of a maize plant, but may have perhaps been read as <K'AN-la> k'anaal ‘yellow’ and in combination with the pictorial image of a maize plant have a meaning of ‘yellow maize’ (Tedlock 2010:86-88). There is no clear reading order, with several repetitions of the <la> syllabogram, which resembles upside-down faces, below the sign <K'AN> k'an ‘yellow, precious’. This may be a visual pun representing maize kernels (Tedlock 2010:88).
Pictorial images had their own system of signification as well. For example, certain designs served to qualify or classify physical attributes of an object in a pictorial image (Bassie-Sweet & Hopkins 2011:141-151; Hopkins 1994; Hopkins & Josserand 1999; Mora-Marín 2008; Stone & Zender 2011: 13–14). These physical attributes included the material of an object depicted (tree, stones, bone, earth, etc.), its color, and even sounds and smells (Stone & Zender 2011: 13–14). Other classifiers might be more broadly conceptual, labeling an object depicted based on how that object fitted into pre-Columbian Mayan worldviews, such as the <AK'AB> classifier signifying ‘darkness, night’ that was also used label depictions of nocturnal animals (Stone & Zender 2011:13-14). Example (2.9) and figure (2.5) are exemplary of this phenomena:

(2.9)

```
   TE'
   'tee'
   tree/wood
   ‘tree/wood’
```

(Image and transliteration from Montgomery & Helmke 2007).
Example (2.9) gives a logogram <TE'> tee’ ‘tree, wood’. Figure (2.5) shows the use of the ‘tree, wood’ classifier in a pictorial image on oars and a tree itself. The classifier consists of a curved line with two semi-circles, also seen in the logogram.

Numerous scholars have also contributed to the knowledge of the structure and uses of pictorial images in hieroglyphic texts. This discussion is not exhaustive and discussed more in section (4). Tatiana Proskouriakoff (1946, 1961) documented distinct architectural styles and patterns of portraits of pre-Columbian Mayan women. Merle Green Robertson also created an extensive record of rubbings of Mayan hieroglyphic textual styles at specific polities, including pictorial images, on monumental architecture (Greene Robertson 1983; Greene Robertson 1985; Greene Robertson 1986; Greene Robertson 1991; Greene Robertson, Macri & Vieira 1993). Linda Schele and John Montgomery contributed to these efforts by creating extensive collections of drawings of pre-Columbian Mayan texts, some of which are available through FAMSI (Foundation for the Advancement of Mesoamerican Studies, Inc.), and now some of these collections are available through LACMA (Los Angeles County Museum of Art). Harri Kettunen
(2006) also contributed to iconographic studies by systematically documenting variation and continuity of ‘nasal motif’ iconography. Jennifer Loughmiller-Cardinal (2008) also demonstrated that the composition of written texts and pictorial images has a distinct, regular pattern in painted polychrome vases, discussed more below.

The complex multimodality of Mayan hieroglyphic texts provided certain communicative affordances to these texts. First, some of these affordances are based on the structure of language represented in the written modality, such as preferring a single (subject) argument per clause, making the expression of events that involve more than one entity indirect. However, it is possible that pictorial images that represented active scenes, as opposed to merely portraits, afforded direct communication of multiple entities’ roles in an event. Thus, pictorial images may have communicated what was not communicated in writing. Second, pictorial images afforded communication about other modalities through its classification of physical attributes, such as color and material in the visual modalities, and smell and sound. Third, what was not expressed in one modality, could be expressed in the other in complementary ways. The various ways these modalities interacted and materialized also gave certain communicative affordances based on various regional or temporal styles and traditions, or the given media type it was expressed on, and this medium’s social use and significance, which will be discussed more in section (4).

4 Media of Mayan Hieroglyphic Texts

This section reviews the compositional and material structures, uses, and socio-historic context of various pre-Columbian Mayan media, and the communicative affordances they provided. Section (4.1) discusses the medium of codices or screenfold books. Section (4.2)
discusses media from monumental architecture, including murals. Section (4.3) discusses portable objects, focusing on vases.

4.1 Codices

Mayan codices are screenfold documents that are painted on both sides in black and red, and sometimes blue-green and yellow, and are made of tree bark of a fig tree, *amate*, that is coated in lime (Aveni 2001:170; Vail 2006). There are four extant pre-Columbian Mayan codices, named after the locations in which they were discovered: the Dresden Codex, the Madrid Codex, the Paris Codex, and the Grolier Codex (Vail & Hernández 2018). However, the authenticity and origin of the Grolier Codex have been debated (Aveni 2001:170). In reality, the number of these books was much larger, but ultimately many did not survive the tropical environment of the Maya lowlands or were lost or destroyed by the Spanish. This is attested by significant colonial records of the existence and confiscation of these books (Chuchiak 2001). Thus, the Mayan priesthood who used and created such books persisted well into the colonial period (Chuchiak 2001).

Typical information recorded in the Mayan codices are *ephemerides*, or tables, for predicting astronomical phenomena like solar, and possibly lunar eclipses, and the cycles of Venus and Mars (Aveni 2001: 170; Bricker et al. 1983; Justeson 2017; Lounsbury 1978). Ephemerides have long count dates, anchoring them in longer cycles of time (Vail & Aveni 2004:138). The long count has a fixed starting point and is a base-twenty system. It consists of the units of baktun ‘a period of 400 years (specifically 360 days)’, *k'atun* ‘a period of twenty years (specifically 360 days)’, *tuun* ‘the anniversary of a cycle of 360 or 365 days’, *winal*\(^{10}\) ‘a

\(^{10}\) It is uncertain if *winal* would have contained a long vowel in its final syllable in pre-Ch'olan.
period of twenty days’, and *k'iin* ‘a day’ (Aveni 2001; Fox & Justeson 1984:48-53). Mayan codices also recorded *almanacs*, giving the proper dates to perform certain activities, like end of year and agricultural rituals within shorter cycles of time (Vail and Aveni 2004:138). Specifically, the tzolkin, the 260-day ritual calendar, and perhaps the *haab’*, a 360-day time period based roughly on the solar year calendar, were used (Fox & Justeson 1984:48-53; Vail and Aveni 2004:138).

Several different layouts were used for ephemerides and almanacs. Due to space, only two examples will be discussed. Figure (2.6) depicts a common layout where there is a column of day signs from the tzolkin on the left-hand side of a page that anchors calendar calculations in the following rows of glyphs on the top of the page (Aveni 2001:170-171):

![Figure 2.6](image-url)

Figure 2.6. Photograph of a typical Mayan almanac layout from the Dresden Codex (Codex Dresden - Ernst Förstemann (1892:2); photo courtesy Ancient Americas at LACMA (ancientamericas.org)).

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11 The term *baktun* is used here based on standard conventions in Mayan research, but this term was likely not used in any Mayan language to reference a period of 400 years. The term *katun* is documented in Yucatec for the word for the 20-year period, but the word *<may>* is also used for this time period, as attested in the *Chilam Balam of Tizimin* (Justeson 2021 personal communication).
Depicted numerals either represent day sign coefficients, in red, or numbers that are added to previous dates to reach another, in black (Aveni 2001:171). Thus, there is a strong arithmetic component to the codices. One starts at the top glyph in the column on the left and then adds the appropriate numbers as indicated in the rows, until one circles back around to the next day sign in the left-hand column (Aveni 2001:171). Pictures below the rows of glyphs depict the ritual activities that occur on the dates listed (Aveni 2001:172-173). Numerical structures for these almanacs include 5 x 52 days, the most common, 4 x 65 days, the next most common, and rarely 10 x 26 days (Aveni 2001:171). In these almanacs, the first number represents the number of day signs in the left-hand column and the second the number of days traversed through until reaching the next corresponding day sign (Aveni 2001:171). Some of these almanacs may double as days in the haab' with tzolkin dates also representing year bearers, the first day in the tzolkin that corresponds to the first day of the haab' (Vail and Bricker 2004:172). Non-calendrical writing above the pictorial images can be arcane and difficult to interpret but, generally references the activities in the pictorial images or ritual activities to be undertaken on the given dates and the individuals (deities) performing them. Figure (2.7) shows an example of an eclipse table that spans several pages:
In figure (2.7), the eclipse table is read across the top halves of the pages, divided by a horizontal line, and then across the bottom halves (Justeson 2017:508). Figure (2.7) shows visible fold marks and how these screenfold books were stored, but also that they could be laid out, to focus on whole tables.

Though the extant codices date to the Postclassic period, some of the ephemerides themselves date to the Late Classic period (Aveni 2004:158). Further, Mayan codices likely had ‘cognate’ ephemerides and almanacs that were manipulated and copied for current needs, thus showing traces of earlier versions and how the codical tradition was maintained over time (Aveni 2004:158). Colonial documents of the Spanish ecclesiastical court that tried to convict Mayan priests of idolatry provide a glimpse into the social context of use of these codices that likely extended to the pre-Columbian era (Chuchiak 2001:136). In colonial Yucatán, there was an organized clergy of Mayan priests ‘aj-k’iino’b’ (Chuchiak 2001). Mayan priests would train new priests, partly through learning to read codices and how to perform the corresponding rituals discussed and depicted within them (Chuchiak 2001:137). Specifically, the codices largely dictated how and when to perform rituals to appease various gods, relating to the agricultural
cycle (Chuchiak 2001:143). Appeasing a given god often involved ritual sacrifice and offerings of food and incense to an idol, image, or figure (Chuchiak 2001:143). The codices were so significant that they were buried with the priests when they died (Chuchiak 2001: 141). Further, Chuchiak (2001:138) argues that since knowledge of how to read hieroglyphic texts was the sole right of the priesthood, without them much of Mayan culture would have been lost in the colonial period. Thus, the codices’ communicative affordances included ritual knowledge that was essential for the maintenance of world order in pre-Columbian Mayan society. However, the structure of the codices afforded that they could only be used by a restricted elite class of priests or scribes. These priests or scribes had to know how to navigate the calendar system and the reading order of ephemerides and almanacs, how pictorial images related to this information, and how to contextualize this information in real world rituals.

4.2 Monumental Architecture

Mayan hieroglyphic texts are also found on numerous features of pre-Columbian monumental architecture, including panels on the walls of buildings (particularly temples and palaces), the columns of buildings, stelae (upright stone slabs), benches/thrones, staircases, altars, lintels, in tombs, ballcourts, and on others. Most texts on monumental architecture were carved or incised, but many building surfaces and accompanying designs were also made in painted colored stucco plaster (Miller 1999:84). Texts in the forms of murals were entirely painted and included a variety of colors, but the full extent of the painting on monumental architecture is unknown due to preservation issues (Miller 1999:84). The content and structure of monumental texts could vary based on the specific media, time period, and polity of origin of a text. Overall though, texts on monumental architecture primarily discuss historical information
and events involving political elites such as dynastic genealogies, the birth, death, heir-designations, and accessions of political elites, royal marriages, wars and captive-taking, and political visits (Kettunen & Helmke 2020:30). Rituals and cosmological information pertinent to these events is also discussed in some cases, but are generally not the focus of these texts to the extent that they are in other media, like the codices (Kettunen & Helmke 2020:30). Given the largely historical nature of these texts, they usually begin with and include extensive calendrical information for when these events occurred.

Hieroglyphic texts thus spanned numerous features of monumental architecture. Figure (2.8) shows a hieroglyphic text that spans an entire staircase, from the polity of Copan:

Figure 2.8. (LEFT) Photograph of the hieroglyphic stairway, structure 10L-26, Temple 26, from Copan in Honduras, detail (Photo by Linda Schele © David Schele (2005:32089); digital image courtesy of Ancient Americas at LACMA (ancientamericas.org)) and (RIGHT) wide shot (Photo by Kerr (n.d.-a:5594d); digital image courtesy of Justin Kerr).
This hieroglyphic text from Copan filled the entire staircase that scales to the top of the temple, totaling at least 2,200 glyphs (Martin & Grube 2008:208). Figure (2.9) shows a relief carved door lintel from a temple from the polity of Yaxchilán:

Figure 2.9. Lintel 25, Temple 23, from Yaxchilán in Chiapas, Mexico (Photo by Kerr (n.d.-b: K2888); digital image courtesy of Justin Kerr).

Figure (2.9) depicts ritual bloodletting to conjure what is known as a ‘cosmic serpent’ among art historians and has hieroglyphic writing on the exterior and interior of the image.

Hieroglyphic texts are also commonly seen on freestanding stelae that are placed in the front of buildings, often in plazas. Contrasting styles of stelae are seen in figure (2.10):
Stela N from Copan shows a stela in a plaza with an accompanying ‘altar stone’. Stela N is of a columnar style in high relief with the portrait of the ruler protruding outwards, and hieroglyphic texts are on the side. Stela 22 from Naranjo exemplifies a slab style of stelae in bas relief, out of its original context. Here, hieroglyphic texts are captioned around a portrait of a ruler. Stela N also exemplifies a key example of a ruler in elaborate attire with a large-feathered headdress.

Some extant murals grace the interiors or exteriors of buildings, such as at the sites of Bonampak (Miller 1986), San Bartolo (Saturno 2005; Golden, Houston & Skidmore 2009; Hurst 2010), Tulum (Miller 1982; Taube 2010), Santa Rita (Taube 2010), Mayapan (Masson & Peraza Lope 2007), and Calakmul (Golden, Houston & Skidmore 2012). Part of the extant murals of the polity of Bonampak are seen in figure (2.11):
Figure (2.11) shows part of a mural from the polity of Bonampak in which there is a procession of musicians. The murals span three separate rooms, covering the walls and ceilings, and describe and depict the accession of a ruler (Miller 1986). The murals also showcase rare evidence of the wide color range used in monumental contexts.

There is debate over the degree to which uses of hieroglyphic texts on monumental architecture were for political or ritual ends, and these differing viewpoints offer suggestions for understanding their communicative affordances. Some contend that more publicly visible texts on stelae and altars contained more historical information, to officialize the rights of rulers to the public (Inomata 2006:810; Kettunen & Helmke 2020:30). In contrast, hieroglyphic texts located in palaces and temples with restricted access, like on lintels and wall panels, are argued to discuss ritual and cosmological events more (Kettunen & Helmke 2020:30). Public performances in plazas, in front of such hieroglyphic texts, are argued to be part of a process of officializing the rights of rulers, given that complete literacy in Mayan hieroglyphic writing was likely
restricted to scribes and political elites (Houston & Stuart 1992; Inomata 2006). Graffiti and pseudo-glyphs, that mimic the structure and form of Mayan hieroglyphic writing, show there was some understanding of the meaning and social value of hieroglyphic writing even without complete literacy though (Coe 1973; Houston, Stuart & Taube 1989; Stuart 1989; Houston & Stuart 1992; Calvin 2006; Carrasco 2013; Jackson 2020). This is suggested by the fact that pictorial images expressed part of a text’s meaning that was complementary to writing in a given text. Hieroglyphic texts provide evidence of performances in pictorial images that depict large processions, sometimes with musicians (Inomata 2006:810). Such performances represented in pictorial images were noted in figure (2.11), above, in the Bonampak murals. Pictorial images in such texts of rulers in elaborate vestments may have been used for such performances, seen in figure (2.10) from Naranjo, given that more naturalistic scenes of elites behind palace walls do not necessarily depict such vestments (Inomata 2006:810).

However, some depictions of rulers’ ceremonial vestments do occur in restricted areas that were likely only accessible to elites (Looper 2009). Thus, some of these vestments may have been used for specific dances, or performances that had a more restricted audience (Looper 2009). Such dances were ritualistic in nature and likely part of the institution of divine rulership, allowing political elites “to become like gods” (Looper 2009). Further, even more publicly accessible stelae may have been inextricably used in rituals. Though stelae often depict royal portraits in their pictorial images, events recorded are often time period endings and their ritual commemoration by elites (Stuart 1996:149). Accompanying ‘altar’ stones suggest stelae may have been used for ritual offerings of incense or blood of a ruler, an example of which was shown in figure (2.10) from Copan (Stuart 1996:149). The ritual act of binding of stelae in cloth when it was erected and displayed was also significantly focused on in many texts (Stuart 1996:
Additionally, Stuart (1996:164) suggests that portraits of rulers on stelae may have been considered extrasomatic extensions of the rulers themselves. Finally, it is important to remember that the architectural layouts of elite structures that housed hieroglyphic texts in some polities represented sacred Mayan cosmograms (e.g. Demarest et al. 2003), and it is in this social context that the use of hieroglyphic texts on monumental architecture should be considered. Monumental texts thus provided political elites the communicative affordance to position themselves as cosmologically central and use this position for political gain. Rituals and performances, whether public or restricted to an elite audience, cemented these communicative affordances and the monumental texts themselves cemented collection memory of these power giving acts (e.g. Kristan-Graham 2001).

**4.3 Portable Objects**

Portable objects also attest hieroglyphic texts and include various media such as different kinds of ceramics, jewelry, bones, shells, figurines, and others, but ceramics will be the main focus of this study. Portable objects could be painted, incised, or carved, and various temporal and regional styles have been identified. Many scholars have argued that the content of hieroglyphic texts on portable objects typically includes ‘name-tagging’ which consists of labeling the object with the owner’s name and a possessed noun naming the object itself (Coe 1973, 1978, 1982; Houston, Stuart, Taube 1989; Houston and Taube 1987; Grube 1990, 1991; Justeson 1983; Krochock 1989, 1991; MacLeod 1979; Mora-Marín 1999a, 1999b, 2000c, 2001, 2004b; Reents-Budet 1994; Schele and Stuart 1985; Stuart 1984a, 1986b, 1987, 1988, 1989, 2005). However, Mora-Marín (2020c) has noted that some of these ‘name-tagging’ phrases may exhibit dative possession where it is specified that the possessed object was
made for someone, the intended recipient and not direct owner, thus suggesting these vessels were recording their use in ritual gift exchange. Additionally, more elaborate texts occur, with some degree of standardization across texts, and narratives and other information are found in some cases as well.

Mora-Marín (1999b, 2001) and Stuart (2005) have advocated for labeling these texts as the ‘Dedication Formula’ because they argue that this is what many of these texts were intended to do - dedicate these objects or elements of them to their owners. Mora-Marín (2004b) argues that for vessels specifically, that their pictorial images, the foodstuffs they were claimed to have held, and the owners themselves could all be dedicated. However, Mora-Marín (2020c) now advocates for using the label of the Primary Standard Sequence (PSS) by Coe (1973) as a more general and neutral label to account for cases where there is no clear dedication predicate. Further, Justeson (2021 personal communication) has noted that although some common predicates have been translated as meaning ‘to dedicate’, no Mesoamerican language attests an indigenous word with a meaning of ‘to dedicate’, suggesting this is not the right characterization of these texts’ functions. The Primary Standard Sequence (PSS) label is thus used in this study. Although the social context of use may suggest that these objects were dedicated, even if not explicitly stated, the term *commemorate* will be used instead. *Commemorate* ‘to mark by ceremony, to serve as a memorial’ has a wider meaning than *dedicate* ‘to inscribe or address by way of compliment’. This wider meaning thus covers a wider range of the possible social functions of the Primary Standard Sequence (PSS), though the author leaves open the best way to describe and label these social functions for future research.

The name-tagging, gifting, and commemoration of objects found in the Primary Standard Sequence (PSS) may be part of an older tradition than narrative texts found later at Mayan sites.
Mora-Marín (2004b) argues that elements of the Primary Standard Sequence (PSS) are found as early as the Late Preclassic (300 BC – 200 AD), though it did not fully take shape until well into the Early Classic period around 450 AD (Reents-Budet 1994). Mora-Marín (2004b) identifies thirteen main variations of the Primary Standard Sequence (PSS) on vessels which could include a variety of elements. These elements include listing the type of vessel, whether it was carved or painted, the vessel’s owner and/or elaboration of their name and titles, a vessel’s presumed foodstuffs contents, commemoration predicates, labels of the pictorial images or writing on the vessel itself, or even speech. Stuart (2005) notes that the Primary Standard Sequence (PSS) also sometimes includes dates, linking them firmly to historical events.

Figures (2.12-2.13) show two examples of non-ceramic portable objects:

Figure 2.12. Photograph of an incised shell trump with a portrait of a ruler (Photo by Kerr (n.d.-b: K3481); digital image courtesy of Justin Kerr).
The incised image bends with the physical shape of the shell. Shells were valuable commodities, and in some cases were used as musical instruments. They thus had symbolic associations with air, breath, and ch'uhleel, or life force, which was discussed in section (2.3.4). Figure (2.13) is of a jade celt that was worn on an elite’s belt (Kerr n.d.-a). This is indicated by the perforation at the top of the celt that would have allowed attachment to a belt and by depictions of rulers that show similar looking objects on such belts. Hieroglyphic writing is incised on one side, and a portrait of a ruler on the other. Jade was also a value commodity, as noted in section (2.1).

There are also many kinds of ceramic vessels. Labels of these vessels in hieroglyphic texts give insight into the emic categorizations of them (Houston, Stuart, Taube 1989). Some of
these types of vessels included *ulak*\textsuperscript{12, 13} ‘his/her/its plate’, *ujawante*\textsuperscript{14} ‘his/her/its footed plate’, *uwe'ib* ‘his/her/its eating thing, his/her/its plate’, *yuk'ib* ‘his/her/its cup’, *ujaay* ‘his/her/its bowl’\textsuperscript{15}, and *ujaay yuk'ib* ‘his/her/its cup, his/her/its bowl’ (Boot 2002, 2003, 2004, 2005a, 2005b, 2005c, 2009, 2010; Houston, Stuart, & Taube 1989; Kettunen & Helmke 2020; Stuart 2005). These studies show that there are distinct correspondences between these labels and the actual shape of vessels they are written on. Figures (2.14-2.15) show some of these types of vases, based on Kettunen and Helmke’s (2020) classification, and the variety of textual layouts and content vessels could have:

\textsuperscript{12} The pronominal clitics \textit{a}= and \textit{u}= will be transcribed in their phonemic forms, without an initial glottal stop, for consistency. To note, when they occur utterance initial, they phonetically have an initial glottal stop.

\textsuperscript{13} Vessel types are translated based on their physical characteristics unless a vessel type’s etymology has been firmly established. For more discussion of their etymologies see the following sources: Boot (2002, 2003, 2004, 2005a, 2005b, 2005c, 2009, 2010); Houston, Stuart, & Taube (1989); Kettunen & Helmke (2020); Stuart (2005).

\textsuperscript{14} The vessel type labeled *ujawante* is identical to the *ulak* vessel type except for its tripod support (Kettunen & Helmke 2020:34). Stephen Houston first identified the vessel type with the term *hawante* in Colonial Yucatec (MacLeod 1990: 300-303). This term may consist of the root *jaw* ‘face up’ and the participle *-an* (Kettunen & Helmke 2020:34; MacLeod 1990; Mora-Marín 2021 personal communication).

\textsuperscript{15} The root *jay* ‘thin’ is found in Yucatec but it is unclear if this is the root being used to label vessels (MacLeod 1990:363).
Figure 2.14. (LEFT) Photograph of a ‘plate’ from Tikal, Guatemala (Photo by Kerr (n.d.-b: K1261), digital image courtesy of Justin Kerr) and (RIGHT) photograph of a ‘footed plate’, unprovenanced (Photo by Kerr (n.d.-b: K1609); digital image courtesy of Justin Kerr).

Figure 2.15. (LEFT) Photograph of a ‘cup’ in profile and (RIGHT) in a rollout (Photo by Kerr (n.d.-b: K680); digital image courtesy of Justin Kerr).
Figure (2.14) shows two examples of ‘plates’, one with and one without feet. The plate without feet has hieroglyphic writing around its rim and depicts a portrait of a ruler from the polity of Tikal at its center (Kerr n.d.-b). In contrast, the ‘footed plate’ has hieroglyphic writing within and around parts of the pictorial image, acting more as captions, with the pictorial image depicting an abstract cosmological scene. Figure (2.15) shows a ‘cup’ with hieroglyphic writing, again acting as captions for the pictorial image. The pictorial image depicts a war scene in a palace, with an executioner holding a decapitated head (Kerr n.d.-b). Loughmiller-Newman (2008:35) also notes of this vessel that it reflects the “canons of Maya painting”, specifically of the layout and composition of hieroglyphic writing and pictorial figures. Figures depicted with wider bodies, a higher more central position in a scene, facing forward or leftward, and closer to hieroglyphic texts and accouterments, indicated the figure had a higher social status (Loughmiller-Newman 2008:40). Since vessels had to be rotated to be completely read, horizontal text spanning the whole rim, was more significant than vertical or shorter texts that focused on one element of the pictorial image (Loughmiller-Newman 2008:40).

The standardization of hieroglyphic texts on portable objects, in contrast to archaeological evidence of these objects’ uses, are revealing of some of their communicative affordances, which will be more fully discussed in chapter 6. For example, foodstuff contents that are routinely labeled on vessels mostly reference maize or cacao drinks, but the meaning of the foodstuff variants is far from agreed upon or understood (Loughmiller-Cardinal 2019; Stuart 2005). Loughmiller-Cardinal (2019) specifically argues that cylindrical vessels labeled as "yuk'ib' ‘his/her cup’ with the Primary Standard Sequence were not actually used for consumption, and at most were used to store cacao beans. Loughmiller-Cardinal (2019) found no chemical residue of cacao, or other foodstuffs, like maize, chili peppers, psilocybin mushrooms, and buffò toxin,
though cacao residue has been found on other types of vessels. These cylindrical vessels also did not show use-ware of cacao beverages, such as staining from a liquid rim but did show some abrasive marks from perhaps removing cacao beans (Loughmiller-Cardinal 2019). The cylindrical vessels were much too thin and porous to contain a liquid for more than a few minutes without damaging external decoration and much too large and heavy to drink from weighing over four pounds when filled with a liter of a cacao beverage (Loughmiller-Cardinal 2019). Pictorial images of elites drinking show them using smaller, undecorated cylinder vessels or bowls (Loughmiller-Cardinal 2019). Vessels that have been found with cacao residue have not contained such pictorial images and only sometimes have written text at all (Loughmiller-Cardinal 2019).

Instead, Loughmiller-Cardinal (2019) argues cylindrical vessels with the Primary Standard Sequence were merely part of political and religious rituals that involved ritual feasting and gift exchange, as described by Reents-Budet (2006). As noted above, there are also correlations in the quality of pottery construction and elaborateness of iconography and glyphic texts with social status throughout the Mayan area (Reents-Budet 2006:218). Pictorial images on cylindrical vessels with the Primary Standard Sequence often portray scenes where accouterments of political power were presented to rulers, such as the cylindrical vessels themselves, or other important historical or mythological scenes (Loughmiller-Cardinal 2019). The use of these vases may have also involved the ritual impersonation of deities (Stuart 2005). Deities are depicted in some of the scenes on the vases and sometimes mentioned in the Primary Standard Sequence on the vase, where rulers may adopt the names of these deities (Stuart 2005). Many of these cylindrical vessels with the Primary Standard Sequence are also found in burials, suggesting they were highly valuable possessions and part of funerary rights (Loughmiller-
Cardinal 2019). Specific styles of vases can also be linked to regional workshops (Coe & Kerr 1998; Miller 1999; Miller, Martin & Berrin 2004; Reents-Budet & Bishop 1998; Reents-Budet 1994; Reents-Budet et al. 2000, 2010), suggesting political control of how they were circulated. Further, there are also examples of the Primary Standard Sequence that label cacao as being from various polities, suggesting ritual consumption was tied to political action (Kaufman & Justeson 2007; Stuart 2005). Loughmiller-Cardinal (2019) thus suggests we should view the Primary Standard Sequence as symbolic and commemorative of events where vases were used, and part of enabling political rights and responsibilities, as opposed to being used for consumption of foodstuffs.

Additionally, portable objects, in general, could be used in ritual caching, where such goods were buried in newly built structures to imbue them with ‘animus’ or life-force and were removed or destroyed when the structure was no longer in use (Harrison-Buck 2004). Such caches were also created and destroyed at key calendrical time periods (Harrison-Buck 2004). Caches thus played a key role in ordering space and time to be in line with Mayan cosmological principles and beliefs (Harrison-Buck 2004). Like burials, discussed in section (2), caches provided a record of land rights whether in small scale domestic contexts or in terms of political boundaries (Harrison-Buck 2004). Portable objects directly played a role in burials, as well (Harrison-Buck 2004). For example, vessels have been found upside down over the face of the deceased, suggesting termination of the use of the object was connected with the deceased’s death (Harrison-Buck 2004). Ritual binding, or bundling, was also done with the deceased and ritual objects, suggesting a similar symbolic connection (Freidel & Guenter 2006).

Portable objects thus afforded communication of more than simply what was referenced by their ‘name-tag’. Portable objects afforded ritual acts that enabled political, intergenerational,
and cosmological relationships and their memory. Hieroglyphic descriptions of their uses are not necessarily attested by archaeological evidence, suggesting the objects’ use in commemoration was their most significant role. This mismatch between stated and actual use is also seen in the relationship between the written texts and pictorial images on vessels. Though a vessel may have the Primary Standard Sequence, other texts on the vessel may convey an unrelated narrative or calendrical information in hieroglyphic captions, and pictorial images may depict anything from supernatural to naturalistic scenes, or simply abstract designs. Though this mismatch between written texts and pictorial images may have been viewed as complementary because of social contexts of use, it afforded aspects of these modalities to circulate separately to the other modality and different media. As is the subject of the rest of this study, this mismatch afforded new meanings of aspects of these vessels to emerge when they traveled to be used in new contexts. Ultimately, this created new uses of hieroglyphic media altogether and their accompanying communicative affordances.

5 Conclusion

This chapter has provided an overview of the relevant aspects of the pre-Columbian Mayan world for this study which examines how political metaphor variably materializes across modalities, media, places, and times. First, the relevant aspects of the pre-Columbian Mayan history, political and economic structures, and cosmological beliefs’ role in these structures were discussed. Additionally, given that the metaphor examined in this study uses the semantic domain of TREES to provide semantic structure for the semantic domain of RULERSHIP, this chapter examined the role and relationship of agriculture and plants in these structures.
This chapter also provided an overview of the complex multimodality of Mayan hieroglyphic texts – that is how exactly the modalities of writing and pictorial images interact to communicate meaning in these texts, the structure of these modalities, and broadly, their communicative affordances. This chapter also reviewed the structure and communicative affordances of various Mayan hieroglyphic media, including monumental architecture, codices, and portable objects, with a special focus on Mayan hieroglyphic vessels. Communicative affordances of the modalities of writing and pictorial images were complementary, with each modality expanding upon or expressing what remained unexpressed in the other. The communicative affordances of each media type were not just based on the typical information contained within, but their role in pre-Columbian Mayan politics, cosmology, and accompanying rituals – moreover, how the texts were actually used in their socio-historic context. The texts themselves not only recorded ritual and political events but provided ritual and political power themselves. Possession of objects with hieroglyphic texts afforded power to officialize political and cosmollogically oriented performances.
Chapter 3 – Bridging Modalities & Media: A Mixed-Methods Approach

1 Introduction

The previous chapter, chapter 2, broadly discussed how the modalities of writing and pictorial images interact in various pre-Columbian Mayan media and the communicative affordances these multimodal media provided in the pre-Columbian Mayan world. This chapter focuses on detailing the methods needed to study how metaphor materializes across different modalities and media and to document metaphor variation across different modalities, media, places, and times. Approaches to studying the multimodal nature of Mayan hieroglyphic texts have been varied, and discussion of metaphor in these texts has only just begun. Much of this research has centered on documenting the poetic structure, or rhetorical forms, in Mayan hieroglyphic texts, with alternative approaches just beginning. However, a focus on rhetorical forms limits integrated analyses of how metaphor materializes across different variables. Instead, this study argues for an approach that can bridge modalities, media, and other variables, as opposed to limiting metaphor to a specific set of rhetorical forms.

To document metaphor variation as it materializes distinctly across different modalities, media, places, and times, this study argues for adapting part of Conceptual Metaphor Theory’s approach to metaphor. In this view metaphor is not limited to a particular rhetorical form; rather it is the use of one semantic, or conceptual, domain to provide semantic structure for another. The metaphor examined here, which this study labels RULERS ARE TREES, uses the domains of RULERS and TREES. This conceptual approach allows for an integrated analysis of meaning across different instances. This study also argues for using a mixed-methods approach for historical
research that integrates both corpus linguistics and discourse analysis. Corpus linguistics allows for the statistical mining of large bodies of texts and accounts for the variation of a metaphor across modalities, media, times, and places. Discourse analysis considers the communicative context of a given example to balance against decontextualized statistics. Given the limited availability of corpora for Mayan hieroglyphic texts, several corpora and sources are used, including later colonial alphabetic Mayan texts which help contextualize results.

Section (2) discusses previous approaches to studying Mayan hieroglyphic texts, focusing on rhetorical approaches, the limited metaphor research done on these texts to date, and what communicative affordances these approaches have lent to the study of Mayan hieroglyphic texts themselves. Section (3) discusses alternative metaphor theories to Conceptual Metaphor Theory, which are also largely based on a rhetorical approach. Section (4) details Conceptual Metaphor Theory’s conceptual approach to metaphor and its benefits as a research paradigm. Section (5) discusses the problems and limitations of Conceptual Metaphor Theory and responses to these problems. Section (6) argues for adopting a conceptual approach to metaphor while using a mixed-methods approach that integrates corpus linguistics with discourse analysis that can fully account for metaphor variation across modalities, media, places, and times. This chapter also discusses the corpora and sources used in this study and some of the methods used in utilizing these corpora and sources. Finally, section (7) provides a summary and conclusion.

2 Metaphor and Approaches to Mayan Hieroglyphic Texts

Section (2.1) reviews previous approaches to understanding Mayan hieroglyphic texts, including the earliest approaches, decipherment approaches, and what this study labels as rhetorical approaches. It also discusses the role of multimodal research in these approaches.
Section (2.2) discusses the few studies on metaphor in Mayan hieroglyphic texts and Mayan languages. Both sections discuss the communicative affordances these approaches have lent to understanding Mayan hieroglyphic texts.

2.1 Previous Approaches to Mayan Hieroglyphic Texts

Previous approaches to Mayan hieroglyphic texts have lent their field of study certain communicative affordances. These affordances have been centered in various paradigms that favor certain research questions and outcomes (Bassie-Sweet & Hopkins 2018:5-10). These approaches have advanced knowledge of Mayan hieroglyphic texts, but their foci should be acknowledged and discussed in any new study of these texts. The first approach to Mayan hieroglyphic texts did not acknowledge that the hieroglyphs were phonetically based, representing the speech sounds of a language (Bassie-Sweet & Hopkins 2018:5-10). Additionally, this approach denied the hieroglyphic texts recorded historical events (Bassie-Sweet & Hopkins 2018:5-10). Instead, the approach focused on documenting the formal features of their structure and variation of these texts (Bassie-Sweet & Hopkins 2018:5-10). This approach culminated in the work of Thompson (1950; 1962) (Bassie-Sweet & Hopkins 2018:7).

Subsequently, the decipherment approach definitively demonstrated that Mayan hieroglyphs were phonetically based, representing the speech sounds of a language. This approach began with some early work, such as that by Rosny (1876) and Thomas (1888), but failed or did not gain traction until Knorozov (1952, 1967), as discussed in chapter (2) (Bassie-Sweet & Hopkins 2018: 7-9). This approach also showed the texts recorded historical events, notably by Proskouriakoff (1960, 1961), who demonstrated patterns in dates on stelae roughly corresponded to the typical time periods of major events in human life (birth, marriages, deaths,
etc.) (Bassie-Sweet & Hopkins 2018: 7-9). Further, Heinrich Berlin (1958), showed that these historical events were tied to specific archaeological sites (Bassie-Sweet & Hopkins 2018: 7-9).

Though the decipherment approach afforded discussion of how Mayan hieroglyphic texts recorded history, its rejection of previous non-linguistic, ahistorical approaches shaped how this history was viewed. Emphasis was placed on interpretations that rested on literal, referential meaning. Strong adherence to literal interpretations, however, creates tensions when the relationship between text and history is indirect or abstract. For example, as discussed in chapter 2, Loughmiller-Cardinal (2019) recently demonstrated that there is no evidence, in terms of chemical residue or use-ware, that some kinds of Mayan hieroglyphic vessels were used for drinking, despite these vessels being labeled as having this function. A new approach has begun examining the historical uses of such texts through rhetorical framing that is rooted in specific discursive, poetic, and narrative structures (Bassie-Sweet & Hopkins 2018). This study labels this approach the rhetorical approach and discusses some key findings from this research, though this discussion is not exhaustive due to space.

A core discursive feature of narratives in Mayan languages is parallelism, where parts of text syntactically or semantically repeat other adjacent or nearby segments (Bassie-Sweet & Hopkins 2018:10-12). A common instantiation of parallelism is the use of couplets and triplets, which have two or three adjacent textual segments or lines, respectively (Bassie-Sweet & Hopkins 2018:10-12). Josserand (1991, 1997) was the first to recognize some of these features in Mayan hieroglyphic texts. Josserand (1991, 1997) argued that hieroglyphic texts on stelae and monuments were structured as narratives, having elements that set a scene, structures that mark episodes from individual, peak, focused, foregrounded, and backgrounded events. Importantly, Josserand (1991, 1997) noted that narrative elements can be marked through the use of couplets
or triplets, elaboration, and syntactic fronting or promotion (Josserand 1991, 1997). An early work by Hull (2003:378-503) examined the poetic structures of Mayan hieroglyphic texts, specifically the different forms of parallelism, alliteration, and unusual syntax found within them. Hull (2003:501) found that a given medium or genre did not correlate with the use of specific rhetorical devices over others. These earlier approaches were elaborated upon at a conference in 2008 that became the basis for a dedicated collection of papers on genre, discourse, and poetics in Mayan language texts, past and present edited by Hull and Carrasco (2012) (Bassie-Sweet & Hopkins 2019:10). Tedlock (2010) significantly elaborated on these approaches, arguing much has occurred in way of the decipherment of hieroglyphic texts, but not in the way of translation. Specifically, Tedlock (2010) examined the literary characteristics of Mayan texts across media and time, from the earliest pre-Columbian texts to contemporary times, noting the presence of parallel verses and prosodic elements. Significantly, Tedlock (2010) also demonstrated how the visual nature of hieroglyphs themselves and accompanying pictorial images interact in these narrative structures. Bassie-Sweet and Hopkins (2018) have developed these approaches further by identifying narrative structures across modalities, specifically demonstrating there are monomodal pictorial couplets and multimodal ones, as opposed to the strictly monomodal verbal couplets previously identified.

2.2 Metaphor Research in Mayan Hieroglyphic Texts

To date, there has not been extensive research on metaphor in Mayan hieroglyphic texts. There has been some influence from the rhetorical approach just discussed. For example, Hull (2003:410-437, 510-521, 2012) and Knowlton (2002) examine diphrastic kennings, also known as semantic couplets, or disfrasismo, which are a form of parallelism that unite two seemingly

(3.1)

<table>
<thead>
<tr>
<th>TOK'-PAKAL</th>
</tr>
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<tbody>
<tr>
<td>took' #pakal</td>
</tr>
<tr>
<td>flint shield</td>
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</tbody>
</table>

‘flint shield’ / ‘war’ (Example from Hull (2012: 95-97); Image and transliteration from Montgomery & Helmke 2007)

In example (3.1) tok'-pakal can be directly translated as ‘flint-shield’ but is in practice used to signify ‘war’. In contrast, Bassie-Sweet and Hopkins (2019) note that diphrastic kennings might be better labeled as metonymies, where elements of a single semantic domain are used to stand for all of the domain. This makes sense because in example (3.1), it is clear that flint and shield are only some of the semantic elements, specifically instruments, from the semantic domain of WAR.

Following the rhetorical forms approach, Tedlock (2010) also notes the role of visual and auditory similarity in word play in hieroglyphic texts but does not directly address metaphor. However, Tzeltalan, Ch’olan, and Yucatecan language families, and other Mayan languages, attest an emic categorization of ‘speech play’ that includes plays on words’ meanings through repetition and rhymes and are often metaphorically based (Burns 1983; Hull 2003; Gossen 1974;
Stross 1973; Tedlock 1982). Tedlock (1982) details the role of sound similarity in metaphorical construction in K'iche', stating that a word with merely a similar syllable to another word can propel metaphoric constructions. For example, the day Tz'i’ ‘dog’ in the 260-day calendar is not interpreted as ‘dog’, but a mnemonic for words that share the syllable tz'i’, such as tz'ilonic ‘to be dirty, stained, impure’ (Tedlock 1982). Tz'ilonic ‘to be dirty, stained, impure’ could then be interpreted metaphorically in answering a client’s question in a divination, such as whether one should marry a specific person. Tz'ilonic ‘to be dirty, stained, impure’ would be interpreted metaphorically in terms of the potential spouse’s sexual morality, and the answer would thus be no (Tedlock 1982).

In relation to metaphor, ‘speech play’ has been also extensively documented in Tenejapa Tzeltal by Brian Stross. Stross (1973) documented that jokes in Tenejapa Tzeltal rely upon creating ambiguous discourse contexts that make listeners contemplate the relation between two senses of a word, and this relation may be metaphorically based (Stross 1973: 35). These jokes in Tenejapa Tzeltal often involve metaphors for sex, body parts, elimination, social roles, and the supernatural (Stross 1975). Further, in Tenejapa Tzeltal, metaphors are acquired by children as a part of play, with children later learning metaphors common in Tzeltal outside of this context (Stross 1975:321). Specifically, play provides contexts in which physical objects need to be used as if they are something else (Stross 1975:321). Metaphors involving physical similarity are thus acquired first, and then those that involve similarity of action and function (Stross 1975:321). For example, Stross (1975) documented Tenejapa Tzeltalan children who were collecting eggs and then pretended that they were hens and their testicles were eggs, given their similarity in shape.
Other research has labeled various uses of signs and pictorial images in Mayan hieroglyphic texts as being metaphorically based, as opposed to focusing on their rhetorical forms. However, these approaches do not necessarily use the same definition of metaphor used in this study, nor necessarily distinguish between icons, indices, and symbols, discussed in chapter 2. For example, Looper and Kappelman (2001) label instances of umbilical cords and ropes portrayed as flowers in Mayan hieroglyphic art as metaphors. Hoopes and Mora-Marín (2009) discuss the metaphorical conflation of birth, sacrifice, and healing. Matsumoto (2013: 14–16) explores how mirror image glyphs would have been interpreted metaphorically as representing the supernatural world, allowing a reader to participate in ritual action. Though these studies have significantly documented various uses of signs and pictorial images in Mayan hieroglyphic texts, their focus has not been on identifying and detailing the semantic structures of the discussed metaphors, or even whether the examples they discuss are should be labeled as a metaphor or another specific kind of sign use.

In contrast, some studies have begun to examine metaphor in Mayan hieroglyphic texts using an explicit cognitive approach developed in Conceptual Metaphor Theory. In this approach, discussed more fully in the remainder of this chapter, metaphor is explicitly defined conceptually, and the conceptual or semantic structure of a metaphor is detailed. For example, Jackson (2013) uses the theoretical premises of Conceptual Metaphor Theory to understand the Classic Mayan political system, arguing that metaphors are evidence of conceptual systems, which can be used to influence action. Jackson (2013:114) also argues that Mayan thought is ‘transitive’ in nature where meanings move across semantic domains forming oppositional pairings, and consequently that metaphor operates in such a way. This may be a misreading of

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16 See Matsumoto (2013) for a review of other scholars who have discussed the use of mirror image glyphs, such as Schele and Miller (1986).
fundamental concepts in cognitive approaches to semantics, where transitivity does not imply oppositionality and may also be characteristic of metonymies, as opposed to metaphors, discussed more fully throughout this chapter. Jackson (2013) also does not use the framework of Conceptual Metaphor Theory itself to identify metaphors or analyze their structures, providing only brief comments on what the structures Jackson (2013) purports to identify are. Wiseman (2015) compares metaphors for rulership in pre-Columbian Mayan society, Sumer, and the twentieth-century European workplace. Wiseman (2015) uses Conceptual Metaphor Theory to develop a more abstract schema for rulership shared amongst these metaphors. Wiseman (2015:175, 181-182) argues such schemas as developed in Conceptual Metaphor Theory can be used to hypothesize what metaphors will be present in a culture if the society has certain features or structures. Wiseman (2015), however, does not provide an in-depth analysis of how given evidence from language, religion, or art directly supports the metaphors he constructs. Justeson (2010) provides the most complete analysis of metaphor with influence from Conceptual Metaphor Theory, looking at the development of the concept of \textit{ZERO}. Justeson (2010) reconstructs metaphors for \textit{ZERO} across Mesoamerica by examining the structure of numeral terms, the polysemy of terms for \textit{ZERO}, and the specific cultural contexts of mathematical practice in pre-Columbian Mesoamerica.

Explicit discussion of multimodal metaphors has also been limited. Thompson (1954:191-192, 1966) discussed what he calls \textit{metaphorgrams}, a supposed kind of glyph whose visual referent is connected to its meaning via a metaphor. Thompson (1954:191-192, 1966) provides an example of a glyph that visually depicts an upside-down head of a bat (T756inv), which he specifically claims depicts a sleeping bat. Thompson (1954:191-192, 1966) claims the glyph (T756inv) has a meaning of ‘ending, resting’ based on its use in contexts of calendrical
period endings and based on a phrase from the Ch'ol language that references bats to refer to extreme fatigue. The meaning of the glyph (T756inv) in calendrical contexts is connected to its visual referent, a sleeping bat, by way of a metaphor where time is conceptualized as a never-ending, cyclic, journey, that simply pauses, or rests, between various legs or cycles. Because Thompson (1954, 1966) did not accept that Mayan hieroglyphic writing was based on phonetic principles, his concept of a metaphorgram is dubious. However, Thompson (1954:191-192, 1966), notes a few cases of visual metaphors in pictorial images and connects these to those in the Yucatec Maya language. Without an explicit definition of metaphor, some of Thompson’s (1954, 1966) examples might be best labeled as metonymies. Stone and Zender (2011:22) also briefly discuss visual metaphors in Mayan hieroglyphic texts that they purport are “depictions of something that are wholly different from what it represents”.

In contrast, Hamann (2018) has begun discussing multimodal metaphors in an explicitly cognitive framework. Early studies by the author, Dinkel (2018, 2019a, 2019b, 2019c, 2020) that are more fully elaborated here, have begun work using a new framework for studying metaphor across modalities, media, times, and places in Mayan hieroglyphic texts. This new framework is necessary because most other studies of metaphor in Mayan hieroglyphic texts have only afforded a limited view of metaphor – as a rhetorical or poetic device, as a manifestation of symbolic systems, or as a representation of explicit conceptual structures. Further, a focus on decipherment approaches may have limited an examination of metaphor altogether. The framework developed and used in this study is elaborated in the following sections and is based on explicitly practiced metaphor theories while addressing their shortcomings.
3 Early Accounts of Metaphor

Before Conceptual Metaphor Theory, most accounts of metaphor were based on the view that metaphor was a special kind of rhetorical form. The earliest account of metaphor and this view originates from the Greek philosopher Aristotle, discussed in section (3.1). This viewpoint was the basis of many later philosophical accounts of metaphor, discussed in section (3.2). Section (3.3) discusses shifts away from the rhetorical approach to metaphor towards a semantically and conceptually driven approach that preceded and influenced Conceptual Metaphor Theory – the central paradigm for metaphor research today.

3.1 The Aristotelian Account of Metaphor

Until the mid-twentieth century, most accounts of metaphor can be traced back to Aristotle (Johnson 1981:8). Aristotle offers the first definition of metaphor in western philosophy, found in his *Poetics* (1457b.7) (Johnson 1981:5; Aristotle 1997). According to Aristotle, metaphor has three criteria: (1) it occurs at the level of words, or names for things, (2) is deviant from ordinary language usage, and (3) is based upon some underlying similarity between two things (Hill 2011:4-5; Johnson 1981:5-6). Aristotle also viewed metaphors as being shortened similes, with the omission of words such as *like* or *as* that signal an explicit comparison (Johnson 1981:7). For example, the metaphor *Achilles is a lion* can be viewed as a shortening of the simile *Achilles is like a lion* (Johnson 1981:7). Aristotle also believed some metaphors were better than others, with those that caused us to have a new understanding of a subject as the best, and that trying to understand a metaphor could be a very enjoyable mental exercise (Hill 2011:5; Johnson 1981:7).
Many philosophical accounts follow Aristotle in several regards. First, such accounts generally define metaphor as being a special kind of rhetorical or figurative device that differs from ordinary language usage (Hills 2011:1; Johnson 1981:4, 7). Second, metaphor is argued to be the likening or comparison of one thing in terms of another that is not a simile (Hills 2011:2). Diverging from Aristotle is the argument that the linguistic forms of metaphors are variable and not limited to the level of names or nouns (Hill 2011:2-4). Most accounts allow for explicit forms, with a copula, or implicit forms, by way of syntactic parallelism (Hill 2011:2-4). Most accounts also argue a metaphor can occur tightly together in a text or piece of discourse or can be spread throughout it (Hill 2011:2-4). Finally, it is also contended that metaphors can be paraphrased literally, without any loss of meaning or understanding of the original metaphorical construction (Hill 2011:6; Johnson 1981:4). However, it is not clear if Aristotle held this last view (Johnson 1981:7).

3.2 Philosophical Accounts of Meaning and Metaphor

After the mid-twentieth century, many philosophical accounts of metaphor continued to be influenced by aspects of Aristotle, with additional consideration of truth conditional semantics and its idea of ‘literalness’. Truth conditional semantics is a general paradigm in philosophy that accounts for meaning in terms of truth or falsity (Davidson 1967; Lewis 1970; Saeed 2009:305-306; Tarski 1944). Importantly, truth conditional semantics only analyzes the propositional content of an utterance, which only consists of predicates and their arguments (Davidson 1967; Frege 1951; Saeed 2009:305, 309; Tarski 1944). Historically, truth conditional semantics has left any social, emotive, or communitive information of an utterance unanalyzed (Frege 1884/2020; Johnson 1981:17). Though there are differing theories about what truth and falsity themselves
The most relevant to metaphor theory is a correspondence theory of truth. The correspondence theory of truth holds that sentences are true, or literal, when a speaker judges the situation that an utterance describes as corresponding to, or matching, an actual situation in the external world (Saeed 2009:306; Russell 1906; Tarski 1944; Wittgenstein 1922). Importantly, understanding meaning does not only involve modeling how speakers represent meaning in their minds but demonstrating how a given utterance matches or does not match conditions in the external world (Saeed 2009:306; Russell 1906; Tarski 1944; Wittgenstein 1922). The use of truth conditional semantics to understand metaphor was originally developed by logical positivists (Johnson 1981:16-17; Ogden & Richards 1923). All kinds of speech, including metaphor, that were judged as non-literal were claimed to be unworthy of explanation, or were argued to be reducible to a literal paraphrase that could be denoted in terms of truth conditions (Johnson 1981:17; Ogden & Richards 1923).

Three philosophical approaches to metaphor are influenced by some aspect of truth conditional semantics: (1) comparativist accounts, (2) pragmatic twist accounts, and (3) brute force accounts (Hill 2011). Comparativist accounts claim that metaphor is simply an indirect comparison between two things of the form $A \text{ is } B$ (Hill 2011:16-20; Johnson 1981:24). These forms can be directly, or literally, restated as a simile of the form $A \text{ is like } B$ (Hill 2011:18; Johnson 1981:24). The comparativist account implies that there are objective sets of similarities that are compared between the two things in question (Hill 2011:17; Johnson 1981:24). However, to assign a metaphor a truth value one must judge in what sense two things are alike, and this might be determined by the context of the conversation (Hill 2011:18). For example, the metaphor *Achilles is a lion* could be restated as *Achilles is like a lion*, and be assigned truth value.
based upon which similarities between Achilles and a lion seem relevant given the conversation, such as fierceness, the quality of one’s hair, etc. (Hill 2011:16-17).

Ortony (1979) offers a modified version of the comparativist approach by rejecting the claim that metaphors can be restated literally in the form of a simile because he argues similes themselves are not literal and thus false, and distinct from literal, or true, comparisons. Though he does not reject truth conditional semantics outright, Ortony (1979:197) diverges from other comparativist accounts by arguing the same processes underlie both non-literal comparisons, or similes, and literal comparisons. Ortony (1979:200) argues non-literal language simply “stretches” beyond language’s normal limits. Ortony (1979:196) argues the differences between literal and non-literal comparisons are due to the degree of salience of the predicates implied to be shared by the two things compared. Salience is defined as the degree of importance the predicate is in identifying something to someone who does not know what the thing in question is (Ortony 1979:195). In the salience account, Ortony (1979) also shows the beginnings of a semantic, or conceptual, account of metaphor.

In a small-scale study, Ortony (1979:195) found that things compared in literal constructions usually share high salience predicates, whereas in non-literal comparisons a high salience predicate for one item is a low salience predicate for the other. This explains the common asymmetry found in non-literal comparisons, versus the symmetry of literal comparisons (Ortony 1979:196). For example, in a literal comparison, one can have either of the things compared acting as the subject without changing the meaning of the utterance (Ortony 1979:197). This is seen in examples like *Raspberries are like blackberries* and *Blackberries are like raspberries* which have the same meaning regardless of whether *raspberries* or *blackberries* is the grammatical subject (Ortony 1979:197). This is not the case for non-literal comparisons,
such as in the examples *Warts are like billboards* and *Billboards are like warts* where the two utterances have a substantially different meaning (Ortony 1979:196). In non-literal comparisons, the high salience predicate promotes, or emphasizes, the predicate for the other item being compared or is newly applied and gives fresh insight to that item (Ortony 1979:199-200). Metaphors likely operate in the same way that non-literal comparisons do, except it has to first be comprehended that the metaphor contains an implicit comparison (Ortony 1979:199).

Pragmatic twist accounts generally explain how metaphors work by appealing to their place in conversational dynamics (Hill 2011:9). Pragmatic twist accounts define metaphor as when the literal meaning of a speaker’s utterance is interpreted and intended to be meant as something else, that is, a non-literal meaning (Hill 2011:9). Searle (1979) provides an example of a pragmatic twist account. In contrast to other accounts of metaphor, Searle (1979:249-251) argues sentences and words only have one meaning, their literal meaning, which is based upon truth conditions, and that there is no such thing as metaphorical meaning. Searle (1979:251) diverges from normal accounts of truth conditional semantics though and proposes that truth and falsity are based on a shared set of assumptions between conversational participants, which are not necessarily objective. Understanding a metaphor is thus based upon what a speaker intended an utterance to mean in context, not something about the actual semantics or structure of the utterance in question (Searle 1979:250). A hearer cues into what a speaker intends to mean, including metaphorical instances, through conversational dynamics (Searle 1979:274).

The conversational dynamics involve three steps. The first is that the hearer recognizes the utterance is somehow odd if taken literally (Searle 1979:274). Second, the hearer considers what the literal interpretation of the metaphorical utterance is by trying to see all the possible ways the subject of the utterance is like the thing it is being compared to. Last, the speaker
figures out what precise similarities are being alluded to. Searle (1979:274-281) lists numerous criteria for interpreting how a hearer determines which similarities the metaphor utilizes, though he does not take this list to be exhaustive. For example, a similarity can be suggested when the metaphorical language of an utterance has a term that refers to a salient property that the literal restatement proposes (Searle 1979:276). For example, *Sam is a giant* literally means ‘Sam is big’ by virtue of the fact that a salient feature of giants is that they are big.

Brute Force accounts contend that metaphors are simply framing devices that place the primary subject of an utterance in a special light to provide new insight (Hill 2011:20). Metaphors do not have any unique meaning of their own because they are only a discursive device (Hill 2011:20). The meaning derived from the framing effect of metaphors is due to those interpreting and those who originated the metaphor, allowing for multiple possible insights to arise (Hill 2011:20). Davidson (1978) is an example of a brute force account of metaphor but adds substantial detail when arguing for this position. Davidson (1978:200-201) additionally claims that all meaning is based upon literal meaning and there is no such thing as metaphorical meaning. This is because metaphors are inventive and a kind of artistic success, analogous to jokes, with no clear standard or rules on how to produce or interpret one. This means that metaphors can have multiple meanings (Davidson 1978:200, 218). Thus, even though Davidson (1978:202) rejects metaphorical meaning arising from the words or phrases themselves, he also rejects the idea that metaphorical meaning comes from speakers’ intentions, as proposed by Searle (1979).
3.3 Beginnings of Semantic and Conceptual Accounts

Semantic Twist accounts, also called Interaction accounts, are the precursors to Conceptual Metaphor Theory. Semantic Twist accounts contrast with the philosophical positions just discussed by contending metaphors have separate, emergent meaning that is not reducible to some kind of literal, or truth-conditional, meaning (Hill 2011:7; Johnson 1981:27). Instead, Semantic Twist accounts contend that metaphors operate by some sort of interaction between words that sets up a system of properties that are commonly associated with each (Johnson 1981:27). When a speaker takes the literal meanings of each word in the metaphorical utterance, something seems incongruous, and to make sense of the utterance, a new meaning arises for some of the words in question (Hills 2011:27). Importantly, this diverges from the comparativist view because what is being compared is not the actual properties of objects, but our thoughts about the objects denoted by various terms (Johnson 1981:27-28). Semantic Twist accounts thus paved the way for accounts of metaphor that were not based on truth conditional, or referential, semantics, importantly Conceptual Metaphor Theory.

Several major figures developed Semantic Twist accounts. Richards (1936) was the first to make several important claims divergent from philosophical accounts of metaphor. First, Richards (1936:51) claimed that metaphors are not just derived from mere words, but from thought. Metaphor is thus not a special or deviant form of speech but is present in most conversations, including academic and intellectual theories (Richards 1936:50). Additionally, Richards (1936:60) argues that metaphor, being based in thought and not just language, structures our perception of the world. This is strikingly different from philosophical accounts that stress that language accurately reflects the way the world is. Metaphors operate, then, by having two different thoughts activated at once, with the metaphorical word of a given utterance
having special metaphorical meaning because of this interaction (Searle 1979:52). Richards (1936:53) also introduces terminology to analyze the structure of metaphors and how they operate in detail. Prior to this, metaphors were largely talked about as a single unit (Richards 1936:53). Richards (1936:53) denotes the subject of metaphors as the *tenor* and those elements that are structuring understanding of the tenor as the *vehicle*. Finally, in arguing for the essentiality of metaphor to language, Richards (1936:56) claims that metaphors can never really be dead, or grammaticalized, because they can always be used again in ways that evoke the original metaphor.

Black (1955) developed Richards’ (1936) views further and brought them to mainstream academic circles (Johnson 1981:19). Like Richards (1936), Black (1955:64) argues that metaphors are not about linguistic form but about thought. Specifically, Black (1955:67) argues the meaning of most metaphors rests in the meaning of words and phrases, and not their context of use since we can identify many metaphors out of context. Like Richards (1936), Black (1955:65-66) breaks down metaphors into their constituent parts, substituting the terms *frame* for *tenor* and *focus* for *vehicle*. Black (1955:66) argues the focus is the language that carries the metaphorical meaning. Metaphorical meaning is not reducible to some sort of paraphrased or literal meaning because a new metaphorical meaning arises from the interaction of the frame and focus, giving us new information about both (Black 1955:72). The focus acts as a filter for understanding the frame by transporting implications of the focus onto the frame (Black 1955:73). The focus, though not the primary subject, is also extended in meaning because if you substitute a different frame, the frame creates a slightly different connotation for the focus (Black 1955:66). Thus, similarities are not denoted by metaphors but *created* (Black 1955:72). Black (1955:74) argues metaphors create meaning by setting up a system of associations, or commonly
believed properties of the frame and focus. This contrasts with comparativist accounts based on truth conditional semantics that contend the actual properties of objects are being compared. Black (1955:76, 78-9) also importantly introduces the idea that there may be different kinds of metaphors based upon their level of generality and the specificity in which they work.

Sapir’s (1977:3) account of metaphor, and of what he calls tropes in general, is similar to Semantic Twist accounts by contending that metaphor is a matter of meaning, not linguistic form, and the relationship between meanings cannot be reduced to logical analysis or paraphrase. As an anthropologist, Sapir (1977:5) had the goal of providing a typology of tropes based upon Aristotle, Richards, and Levi-Strauss, to aid in interpretation since tropes cannot be reduced to logical form. Sapir (1977:5) argues the best interpretation of a trope fits with wider cultural understandings of it. Sapir (1977) catalogs criteria for internal and external metaphors, metonymies, and synecdoches. An internal metaphor involves the juxtaposition of two terms from separate semantic domains that share properties in common, with one being the subject and the other giving information about that subject (Sapir 1977:6-12). An external metaphor, which might also be labeled as an analogy, compares two terms from separate semantic domains but looks to how each term has similar relationships to their own semantic domain as opposed to properties the terms share (Sapir 1977:23). Metonymy is the use of a term from a single semantic domain to refer to another term from that same domain (Sapir 1977:20). Finally, synecdoche is like metonymy, except the terms in question are in a hierarchical relationship, with one term being more general or specific than the other (Sapir 1977:12-13).

Reddy’s (1979) paper on the conduit metaphor in English is cited as widely influential in conceptual accounts of metaphor as well (Lakoff 1993:203-204). Like other Semantic Twist accounts, Reddy’s (1979) approach to metaphor demonstrated that metaphor was a matter of
thought and not merely language, and that metaphor was ubiquitous in everyday speech (Lakoff 1993:203-204). Reddy’s (1979) approach was influential because it was the first to show how these theoretical views on metaphor could be demonstrated with linguistic data, by cataloging numerous kinds of linguistic examples and showing how each was based on a single, underlying metaphor (Lakoff 1993:203-204). Reddy (1979:285) cites examples such as *Try to get your thoughts across better* and *You still haven’t given me any idea of what you mean* as exemplifying what he labels as the conduit metaphor. These examples imply that the semantic domain of communication is understood as a conduit in which objects are transferred (Reddy 1993:290-291). Internal feelings, states, and ideas are believed to be expressed by putting them into an external package and then inserting them into a conduit for another person to receive and open, or understand those feelings, states, or ideas (Reddy 1979:290-91). Reddy’s (1979) approach was also significant for describing how a metaphor influences our thinking about a subject and the social impacts of this thinking. For example, Reddy (1979) elaborates how the conduit metaphor led to the common cultural belief that communication happens effortlessly and automatically without miscommunication.

### 4 Conceptual Metaphor Theory

This section discusses the major positions of Conceptual Metaphor Theory (CMT) and how the theory was a critical response to philosophical accounts of metaphor and a development of semantic twist accounts which helped create the cognitive linguistics tradition itself. Section (4.1) describes CMT as being based on a wider rejection of ‘objectivist’ and ‘subjectivist’ theories of meaning which have influenced other approaches to metaphor. Section (4.2) discusses what CMT has contended about metaphorical structure, which was the most detailed of its time.
Section (4.3) discusses kinds of metaphors and other related cognitive processes as developed in CMT. Finally, section (4.4) discusses how CMT arrives at an ‘experientialist’ account of meaning from their account of metaphor.

4.1 A Rejection of ‘Objectivist’ & ‘Subjectivist’ Theories of Meaning

George Lakoff is arguably the central figure of the cognitive linguistic approach to metaphor with his work on Conceptual Metaphor Theory with Mark Johnson (1980) also spurring the development of the field of cognitive linguistics itself (St. Clair 2002:2). The CMT approach can largely be characterized as a rejection of the entire paradigm of philosophical semantics, replacing truth conditional semantics with an account that takes metaphor as its basis (Lakoff & Johnson 1980; Lakoff 1993; Lakoff & Johnson 1999; Lakoff 2008). The rejection is significant in understanding CMT because the CMT account of metaphor is radically different from its precursors and contemporaries. Broadly, metaphor is argued to be primarily a matter of concepts and not solely one of linguistic form (Lakoff & Johnson 1980:3).

Lakoff and Johnson (1980; 1999) argue against what they broadly characterize as an ‘objectivist’ position on meaning stemming from western philosophical traditions, such as those noted above, and in some linguistic theories. Lakoff and Johnson (1980:198-209) characterize objectivism as holding several tenets. The first tenet is that meaning is objective, with the meaning of a sentence only depending on how it does or does not accurately reflect the external world or whether the sentence is true or false (Lakoff & Johnson 1980:198-199). Falling out of this view is that meaning does not involve any reference to a speaker or hearer’s understanding or processing of a sentence, thus making meaning ‘disembodied’ and free of context (Lakoff & Johnson 1980:199-202). Meaning is also characterized as compositional, where the meaning of a
sentence is the sum of its parts (Lakoff & Johnson 1980:202-203). Meaning is viewed as compositional because objectivist views hold the world is compositional, being made of discrete objects that have definable and knowable properties and relationships with other objects (Lakoff & Johnson 1980:202-203). This compositional principle of meaning is extended to grammar itself with particular linguistic forms treated as discrete objects, which in turn completely divorces linguistic mechanisms from other mechanisms of human understanding and consequently meaning (Lakoff & Johnson 1980:204-205).

Lakoff and Johnson (1980) cite linguistic evidence from metaphors as the basis for their rejection of an objectivist tradition of meaning, finding objectivist accounts of metaphor insufficient. However, Lakoff and Johnson (1980:223-225) do not see subjectivist accounts of meaning as viable alternatives. Lakoff and Johnson (1980:223-225) view subjectivism as stemming from the Romantic philosophical tradition, now present in much of Continental philosophy as well as phenomenological and existential approaches (Lakoff & Johnson 1980:223). Lakoff and Johnson (1980:224) characterize subjective approaches to meaning as individualistic where meaning is unique to the experiencer and largely unknowable in its entirety to others. Subjectivism also views meaning as holistic, with no natural structure that is viewed as simply an imposition of individuals (Lakoff & Johnson 1980:224). Consequently, since meaning has no inherent structure, meaning cannot be modeled by researchers (Lakoff & Johnson 1980:224).

In response to objectivist and subjectivist theories of meaning, Lakoff and Johnson (1980:192-194, 226-228) offer the alternative, experientialist approach to meaning, which addresses the concerns of both theories. Lakoff and Johnson (1980:226-227) contend that belief in absolute truth is not necessary to address objectivist concerns about human knowledge and
morality. Experientialism also acknowledges that human knowledge must be somewhat factual for us to be able to function in our physical and cultural environments (Lakoff & Johnson 1980:226-227). Experientialism addresses subjectivist concerns that meaning always involves individual experience and is not merely a reflection of the external world, while not finding meaning to be unstructured or indescribable (Lakoff & Johnson 1980:227).

Lakoff and Johnson (1980) arrive at their experientalist account of meaning by developing a new theory of concepts based on how humans process concepts as opposed to what they externally refer to. Specifically, they argue that the human conceptual system is largely metaphorical, or that most concepts are at least partially understood in terms of other concepts (Lakoff & Johnson 1980:56). The evidence for their theory of concepts is language use, particularly linguistic metaphors, though CMT rejects a definition of metaphors based upon linguistic form alone. Lakoff and Johnson (1980:3) argue that language use is good evidence for a theory of concepts because the same conceptual system that is used to process language is used to reason and act in the world. This presupposition is a fundamental tenet of the cognitive linguistic tradition (Saeed 2009:355-356). This is in opposition to approaches that follow traditional approaches in linguistics, which presuppose linguistic processing is separate from other cognitive processing (Saeed 2009:355-356).

4.2 The Structure of Metaphors

Lakoff and Johnson (1980) and subsequent works, provide the most detailed accounts of metaphorical structure of their time. Lakoff and Johnson (1980) contend metaphor is based on a relationship between concepts and not definable by the linguistic forms they take. Specifically, metaphor is ‘understanding and experiencing one kind of thing in terms of another’ [emphasis
added] (Lakoff & Johnson 1980:5). The concept that is used to understand the other is called the source domain while the concept that is understood is called the target domain (Kövecses 2010:29). Linguistic metaphors are merely expressions of this underlying conceptual relationship (Kövecses 2010:28). Therefore, many different linguistic metaphors are treated as being the result of the same conceptual metaphor, and cognitively processed the same way.

Lakoff and Johnson (1980) support their conceptual definition by showing the systematic relationship between presumed ‘dead’ linguistic metaphors and ‘novel’ ones. In other approaches to metaphor, metaphors are viewed as novel speech acts, so that when a given metaphor becomes prevalent in a speech community the metaphor is considered to no longer be processed metaphorically (Lakoff & Johnson 1980:107). Rather, these metaphors acquire a different, literal sense, and are ‘dead’ or what many call idioms (Lakoff & Johnson 1980:107). In this scenario, words that triggered metaphorical interpretation are then regarded as having two unrelated senses in the mental lexicon of speakers or are homonyms (Lakoff & Johnson 1980:107, 110-114). Lakoff and Johnson (1980) and Lakoff and Turner (1989) argue against this account because presumed ‘dead’ metaphors are often extended or elaborated upon in seemingly novel linguistic metaphors. This suggests that even if a given linguistic metaphor is routinely used, its underlying conceptual basis is still active if it is to be extended or elaborated upon to construct novel linguistic metaphors. Further, metaphors are not reducible to a comparison of isolated features in a single linguistic metaphor but show systematic correspondences across conceptual domains, allowing for metaphors to have their own internal logic when extended or elaborated (Lakoff & Johnson 1980:7, 89-91).

Thus, many linguistic metaphors, whether considered ‘novel’ or ‘dead,’ may result from a single conceptual metaphor. Lakoff and Johnson (1980:106-107) cite the linguistic metaphor
He buttressed his claim as an example of the conceptual metaphor ARGUMENTS ARE BUILDINGS in English, with ARGUMENTS being the target domain and BUILDINGS being the source domain. This is because linguistic metaphors with other lexical items from these domains are also prevalent in English (Lakoff & Johnson 1980:106-107). Other approaches might account for this linguistic metaphor by claiming a distinct BUTTRESS\(_1\) and BUTTRESS\(_2\) exists in the mental lexicon with divorced semantic senses, and thus that there is no linking of the conceptual domains of BUILDINGS and ARGUMENTS when an English speaker processes this above example (Lakoff & Johnson 1980:106-107).

Lakoff and Johnson (1980:116-117) argue from evidence from metaphors that the nature of concepts themselves is different than typically presumed. Lakoff and Johnson (1980:116-119) contend concepts, as humans cognitively process them, are not based upon inherent properties of objects and thus not reflections of the actual state of the external world. Instead, many concepts are based upon entire domains of experience that are built on interactional properties of how humans naturally interact with and experience the world (Lakoff & Johnson 1980:117-122). Concepts are distinguished from experience itself because interactional properties are more akin to *gestalts* (Lakoff & Johnson 1980:83, 117). Lakoff and Johnson (1980:117-118) define natural kinds of experience as bodily, being based in our physical environment, or being based in our culture and society. Experiential gestalts are multidimensional structured wholes, as opposed to being built on semantic primitives because our basic experiences consist of multiple elements that are routinely correlated (Lakoff & Johnson 1980:81). Lakoff and Johnson (1980:82) contend that experiential gestalts are often structured with the following basic dimensions: participants, parts, stages, linear sequences, causation, and purposes. These dimensions have different values depending upon the kind of experience (Lakoff & Johnson 1980:82). For example, a
conversation gestalt would have the following dimensions and values: participants (speakers), parts (turns at talk), stages (greetings, etc.), linear sequence (order of turns at talk), causation (the expectation of reply after a turn at talk), purpose (dependent on the conversation) (Lakoff & Johnson 1980:78). Concepts are also open-ended and changeable because our experiences change (Lakoff & Johnson 1980:122-123).

Other concepts (targets) are understood metaphorically in terms of another concept (sources) (Lakoff & Johnson 1980:117). Source domains are those just discussed and not understood in terms of another concept. Typically, source domains are based on our physical experiences of the world because these concepts seem to be more clearly delineated and natural than others, though some physical experiences may be no more natural than some cultural or emotional ones (Lakoff & Johnson 1980:56-59). This characteristic of source domains is argued to be important for CMT because without this characteristic nothing ‘grounds’ or forms the basis of the conceptual system (Lakoff & Johnson 1980:56). Meaning would become circular. Target domains are typically more abstract or non-physical concepts. Thus, metaphors are argued to be unidirectional, with only the source structuring the target and not vice versa.

Lakoff and Johnson (1980:153-4) explain the comparative aspect of metaphor differently than other accounts of metaphor by arguing that similarities are a matter of perception and experience of the world. Metaphors can result from these perceived similarities, or are the result of correlations in our experience, with one domain like TIME regularly correlating with the domain of SPACE (Lakoff & Johnson 1980:154). However, metaphors also create perceived similarities and allow for the creation of new meaning (Lakoff & Johnson 1980:147-155).

Metaphorical concepts are structured by the superimposition of the structure of the source domain, or the values of elements of a given gestalt, to the target domain (Lakoff & Johnson
Again, this is a systematic structuring of the target domain by the source domain, and not singular points of comparison (Lakoff & Johnson 1980:7, 89-91). In the metaphor
\textit{ARGUMENT IS WAR}, the values for the dimensions of the gestalt of \textit{CONVERSATION} correlate with values for the gestalt of \textit{WAR}, making the conversation an argument (Lakoff & Johnson 1980:81). For example, \textit{SPEAKERS} would correlate with \textit{MILITARY PERSONNEL}, and various \textit{TURNS AT TALK} to \textit{TACTIC}, etc. (Lakoff & Johnson 1980:80-81). Diagrams of these correlations are referred to as \textit{mappings} as demonstrated in figure (3.1) below of \textit{some} of the possible mappings for the metaphor \textit{ARGUMENT IS WAR} in English:

<table>
<thead>
<tr>
<th>Source Domain: WAR</th>
<th>Target Domain: ARGUMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military Personnel</td>
<td>Speakers</td>
</tr>
<tr>
<td>Tactics</td>
<td>Turns at Talk</td>
</tr>
<tr>
<td>Order of Tactics</td>
<td>Order of Turns at Talk</td>
</tr>
<tr>
<td>Victory</td>
<td>Winning the Argument</td>
</tr>
</tbody>
</table>

Figure 3.1. Diagram of \textit{ARGUMENT IS WAR} metaphorical mappings.

Further, the superimposition of the structure of the source domain on the target domain is \textit{partial} (Lakoff & Johnson 1980:13). Otherwise, the target domain would be reduced to be identical to the source (Lakoff & Johnson 1980:13). The partial nature of superimposition of the structure of the source to the target allows one to highlight or hide aspects of the target domain to be effective in one’s communicative goals (Lakoff & Johnson 1980:10). For example, the metaphor \textit{ARGUMENT IS WAR} might highlight aggression and domination over collaboration and compromise, both being possible outcomes of a conversation (Lakoff & Johnson 1980:10). Many different source domains can structure a single target domain in different conceptual metaphors, highlighting different aspects of the target domain (Lakoff & Johnson 1980:52). For example, the domain of \textit{IDEAS} can
be structured by the domains of PLANTS, PEOPLE, FOOD, MONEY, CUTTING, or INSTRUMENTS, among others, in English (Lakoff & Johnson 1980:46-47).

Because metaphors do not just set up single points of comparison and are systematic, they can have their own internal logic and can be used to reason about the world (Lakoff & Johnson 1980:89-91). This reasoning, with resultant information called entailments, uses the correlates established between dimensions in the source and target domains to transfer additional knowledge from the source domain to the target domain (Lakoff & Johnson 1980:89-91; Kövecses 2010:225-227). Entailments are reconstructed to show how a group of linguistic metaphors are all related to a single conceptual metaphor and are coherent with each other (Lakoff & Johnson 1980:89-91).

Lakoff and Johnson (1980:89-91) demonstrate how the metaphor THE PATH OF AN ARGUMENT IS A SURFACE, found in examples like We have covered a lot of ground, is an entailment of the more general metaphor ARGUMENTS ARE JOURNEYS. By using this general metaphor with the knowledge that JOURNEYS DEFINE PATHS, it is entailed that THE PATH OF AN ARGUMENT IS A SURFACE (Lakoff & Johnson 1980:89-91). It would also be entailed that, if a journey has a path, and arguments are understood as journeys, then arguments must have paths too (Lakoff & Johnson 1980:89-91). Since paths have surfaces, then paths of arguments must as well (Lakoff & Johnson 1980:89-91).

Entailments can also demonstrate how different conceptual metaphors for the same target domain are coherent. Lakoff and Johnson (1980:91-95) demonstrate how the metaphor ARGUMENTS ARE CONTAINERS is coherent with the metaphor ARGUMENTS ARE JOURNEYS by showing they share entailments. Moreover, linguistic examples exist that utilize both metaphors, such as At this point our argument doesn’t have much content, where at this point provides
evidence of the use of the JOURNEY domain and content provides evidence of the use of the CONTAINER domain (Lakoff & Johnson 1980:92). The ARGUMENTS ARE CONTAINERS metaphor entails that as you make an argument more surface is created, just like with the previous entailments for ARGUMENTS ARE JOURNEYS (Lakoff & Johnson 1980:93-94). The knowledge that is transferred from the source domain of CONTAINERS is that When you make a container, you make more of a surface (Lakoff & Johnson 1980:94). The coherency of these two metaphors offers another point that metaphors do not have to be consistent or have a single structure (Lakoff & Johnson 1980:94-95). There is only coherency, and not consistency, with the above examples because each metaphor plays a different role, with the ARGUMENTS ARE JOURNEYS metaphor structuring the form of the argument and ARGUMENTS ARE CONTAINERS structuring the content of arguments (Lakoff & Johnson 1980:94-95). The metaphors thus highlight different aspects of the target domain.

Lakoff (1993:215-216) extends this idea of coherency to apply to how much knowledge can be transferred from the source domain to the target domain. Lakoff’s (1993:215-216) Invariance Principle contends that mappings maintain the image schematic structure of the source domain that is coherent with the structure of the target domain. If an element of the structure of the source is not coherent with the structure of the target domain, then it cannot be transferred (Kövecses 2010: 243–244). This explains why some linguistic examples of a given metaphor are not possible (Lakoff 1993:215-216). For example, the metaphor ACTIONS ARE TRANSFERS does not allow for the entailment that actions can be ‘kept’ like physical objects can (Lakoff 1993:216). This is demonstrated in puzzling examples such as, ?I gave him a punch and he still has it, versus non-metaphorical examples of transfers such as, I gave him a new watch and he still has it. The puzzling examples are as such because actions are temporary, or
momentary, and thus have an element that is incoherent with the source domain, where objects are relatively permanent (Lakoff 1993:216).

Lakoff and Johnson (1980:22-24) also address issues of coherency within a given culture. Though source domains are typically made of our bodily, physical experiences of the world, Lakoff and Johnson (1980) do not deny that culture can always shape our experiences and thus the basic domains that form the basis for metaphorical concepts. However, Lakoff and Johnson (1980) argue there is consistency across languages because humans share many of the same fundamental experiences of the world, whether biological or social. Further, Lakoff and Johnson (1980:22-23) argue that the most fundamental values of a given culture will be coherent with the most fundamental metaphorical concepts in a culture, but not necessarily that anything that is coherent with the metaphorical system will be valued. Morals and values are found to be structured metaphorically, such as with the metaphor MORE IS UP and GOOD IS UP, exemplified in the phrase Bigger is better in American culture. Lakoff and Johnson (1980:23) also acknowledge that there can be conflicts of values in a given culture, and thus with metaphors.

4.3 Metaphor Hierarchy, Kinds, Devices, and Metonymies

In contrast to other accounts of metaphor, CMT has also provided a rich categorization of metaphor and other cognitive processes. Section (4.3.1) discusses metaphor hierarchies, in section (4.3.2) kinds of metaphor, section (4.3.3) metonymies, and section (4.3.4) metaphorical devices.
4.3.1 Metaphor Hierarchy

A discussion of metaphor hierarchy has arisen to account for unused metaphorical mappings which cannot be explained by appeal to the Invariance Principle, discussed in the previous section. Instead, these cases have been explained through establishing a metaphor hierarchy where primary and complex metaphors are distinguished, first by Grady (1997), and later by Lakoff and Johnson (1999). Grady (1997:137) contends primary metaphors are those where there is a strong correlation in experience between the source domain and the target domain. Source domains have a very basic structure and image content and are relational in nature, not encompassing specific entities (Grady 1997: 139-173). Target domains of primary metaphors contrast with other target domains because they are not abstract having a basic structure that are a part of basic experiences (Grady 1997:173). Target domains of primary metaphors differ from sources by lacking image content (Grady 1997:173). An example is the metaphor MORE IS UP, which is structured by our experiences with pouring liquids into containers that increase in volume by moving upwards (Grady 1997:34, 163).

Complex metaphors are composite metaphors made up of primary metaphors (Grady 1997). Grady (1997:200) thus argues certain mappings do not necessarily occur because the metaphors are actually complex, and the given mappings are not compatible with the primary metaphors that are constituent of them. Grady (1997:37-74) demonstrates this principle through the example of the complex metaphor THEORIES ARE BUILDINGS. Grady (1997:40) gives the puzzling examples of ?This theory has French windows and ?The tenants of her theory are behind in rent, to argue that this metaphor is not actually a direct mapping between the domain of BUILDINGS and THEORIES. There is no reason why the cited examples are not possible if one appeals to the Invariance Principle alone. The primary metaphors that make up this complex
metaphor are ORGANIZATION IS A PHYSICAL STRUCTURE and VIABILITY IS ERECTNESS. Thus, these primary metaphors do not allow for mappings involving tenants or specific kinds of windows because these elements from the domain of BUILDINGS do not have to do with the physical longevity of a structure (Grady 1997:50). Grady’s (1997:52-53, 170) work also supports the view that most metaphors are grounded in our actual experiences of the world and unidirectional because complex metaphors are ultimately composed of primary metaphors. In a case like the THEORIES ARE BUILDINGS metaphor, it is not clear that one domain has a stronger experiential basis than the other, yet one does not encounter the opposite metaphor BUILDINGS ARE THEORIES, making finding an experiential basis necessary (Grady 1997:52-53).

4.3.2 Kinds of Metaphors

Lakoff and Johnson (1980:14) contrast other kinds of metaphors from plain, or structural metaphors, where one concept is understood in terms of another concept. These early categorizations of metaphor have evolved over time and may fit into Grady’s distinction of primary and complex metaphors just discussed. First, orientational metaphors organize whole systems of concepts, as opposed to just structuring one (Lakoff & Johnson 1980:14). Orientational metaphors are so-called because they usually have to do with our experiences of spatial orientation, like with the dimensions of up-down, in-out, front-back, on-off, deep-shallow, central-peripheral (Lakoff & Johnson 1980:14). Examples of orientational metaphors are those that are related by using the general metaphor GOOD IS UP (Lakoff & Johnson 1980:18). The source domain UP also structures related target domains like HEALTH and HAPPINESS (Lakoff & Johnson 1980:18). An example of the former is He is at the peak of his health, and of the latter, My spirits rose (Lakoff & Johnson 1980:15). Further developed by Lakoff and Turner
(1989:99), orientational metaphors utilize image schemas, skeletal structures that organize our most basic perceptual experiences of the world, as discussed above.

Second, ontological metaphors are those which structure our experiences in terms of physical entities, substances, and containers (Lakoff & Johnson 1980:25, 29). Ontological metaphors allow us to understand our experiences by allowing us to reify or objectify them. Specifically, this reification allows us to refer to these experiences, quantify them, identify aspects, and properties of them and motivate goals (Lakoff & Johnson 1980:26-27). Examples are the metaphor INFLATION IS AN ENTITY and the metaphor MIND IS A MACHINE (Lakoff & Johnson 1980:26-27). The former is a basic ontological metaphor showing simple objectification of experience. This is seen in the example If there is much more inflation, we’ll never survive, where inflation is an unidentified entity that is quantified (Lakoff & Johnson 1980:26). The latter metaphor gives more detail about what kind of entity or object the target domain is to be understood as - specifically, a machine. This metaphor is seen in the example Boy, the wheels are turning now (Lakoff & Johnson 1980:27). Other examples of ontological metaphors are those that use the source domain of CONTAINERS, a kind of entity, to structure unbounded experiences or physical space, entities, etc. (Lakoff & Johnson 1980:29). An example is seen in Are you in the race on Sunday? where the source domain CONTAINER structures the domain of RACE (Lakoff & Johnson 1980:31). Lakoff and Johnson (1980:33) also claim personification metaphors are a kind of ontological metaphor because our experiences are understood in terms of a physical entity, in this case, that of human beings. Personification can also be very specific, with the source domain being a specific kind of person (Lakoff & Johnson 1980:33). An example is Inflation has attacked the foundation of our economy, where the source domain is a human ADVERSARY, and the target domain is INFLATION (Lakoff & Johnson 1980:33).
A final kind of metaphor discussed by Lakoff and Turner (1989:96) are image metaphors. Image metaphors are distinct from other metaphors discussed above because they map a rich mental *image* from the source domain to the target, as opposed to various non-imagistic elements and relationships (Lakoff & Turner 1989:90). Image metaphors are not the same as image schemas because they detail whole images, and not schematic structures (Lakoff & Turner 1989:90). Part-whole relationships and individual attributes of mental images can be mapped from the source domain to the target domain (Lakoff & Turner 1989:90). An example of a part-whole relationship is a roof to a house or between a tombstone and a grave, and examples of an individual attribute are things like color, curvature, the intensity of light, etc. (Lakoff & Turner 1989:90). An example of an image metaphor is *My wife... whose waist is an hourglass*, where the image of an hourglass structures our idea of what the wife’s waist looks like (Lakoff & Turner 1989:90). The example demonstrates the actual words of the utterance do not pick out which part of the hourglass maps to the waist; the whole image is matched against the wife’s body (Lakoff & Turner 1989:90-91). Image metaphors are unlike other metaphors because they do not transfer rich inferential structure from the source to the target (Lakoff & Turner 1989:90). However, image metaphors may serve as prompts for other kinds of metaphor with knowledge transfer that utilizes the same domains (Lakoff & Turner 1989:92).

### 4.3.3 Metonymies

Metonymies are another kind of cognitive process that is distinct from metaphors. While metaphors utilize one conceptual domain to understand another, metonymies primarily have a referential function, with one entity standing in for another within the same domain (Lakoff & Johnson 1980: 36; Lakoff & Turner 1989: 103). Lakoff and Johnson (1980:36) include
synecdoche, where a part of an object referentially stands in for a whole, as a special kind of metonymy. Metonymies also structure our understandings and concepts and are not just linguistic devices because they highlight or focus our attention on various aspects of the referenced entity, experience, etc. (Lakoff & Johnson 1980:36-37). An example is *We need good heads on the project*, where HEAD stands in for the whole PERSON (Lakoff & Johnson 1980:36). This metonymy specifically refers to intelligent people though because it utilizes the element heads, as opposed to other body parts, which focuses our attention on humans’ cognitive abilities as opposed to other ones (Lakoff & Johnson 1980:36). Also, like metaphors, metonymies can be systematic, where numerous individual linguistic examples result from the same cognitive process (Lakoff & Johnson 1980:39). For example, *He bought a Ford* and *He’s got a Picasso in his den* are both processed as the metonymy PRODUCER FOR PRODUCT, where Ford the manufacturer stands in for the car it produces and Picasso the artist stands in for the painting he created (Lakoff & Johnson 1980:38). Metonymies are also like metaphors in that they are grounded in our experiences and are not arbitrary (Lakoff & Johnson 1980:39). This is because if one thing can stand in for another it is likely already correlated in our everyday experience (Lakoff & Johnson 1980:39). For example, PRODUCER FOR PRODUCT is grounded in our experience of causality between the two entities (Lakoff & Johnson 1980:40).

### 4.3.4 Metaphorical Devices

Metaphorical devices are cognitive processes that alter prevalent, or conventional, metaphors in a language or culture in novel ways. The first way a conventionalized metaphor can be altered is through *extension*, where unutilized elements from the source domain in the conventional metaphor are used to structure the target domain (Lakoff & Turner 1989:67). For
example, the conventional metaphor DEATH IS SLEEP does not normally utilize the element of dreaming, but Shakespeare utilizes this element in Hamlet’s soliloquy: “To sleep? Perchance to dream! Ay, there’s the rub; / For in that sleep of death what dreams may come?” (Lakoff & Turner 1989:67). The second way to alter a conventional metaphor is through elaboration, where already existing slots used in the mappings of the conventional metaphor are filled in unusual ways (Lakoff & Turner 1989:67). An example is Horace’s description of death as “external exile of the raft,” which elaborates the metaphor DEATH IS DEPARTURE (Lakoff & Johnson 1989:68). The metaphor is elaborated because normally the vehicle element is not a raft (Lakoff & Johnson 1989:68). A third way a metaphor is altered is through questioning, where the knowledge structured by a given metaphor is challenged (Lakoff & Turner 1989:69). An example is Catullus’ questioning of the metaphor A LIFETIME IS A DAY, “Suns can set and return again, / but when our brief light goes out, / there’s one perpetual night to be slept through” (Lakoff & Turner 1989:69). The metaphor is questioned because the statement shows how the metaphor is inconsistent with actual life, which does not repeat after death like night and day do (Lakoff & Turner 1989:69). The final way a metaphor may be altered is through composing, where two or more metaphors are combined to produce new connections between domains, usually because they structure the same target domain (Lakoff & Turner 1989:70). An example of composing is from a sonnet by Shakespeare, “In me thou seest the twilight of such a day / As sunset fadeth in the west: / Which by and by black night doth take away, / Death’s second self seals up all in rest”. Some of the metaphors the sonnet combines structure the target domain of LIFE through the source domains of LIGHT, A POSSESSION, and A DAY (Lakoff & Turner 1989:70).
CMT uses its theory of metaphor to ultimately argue for an experientialist account of truth, as opposed to objectivist or subjectivist accounts. Conceptual metaphors are used as the core evidence for an experientialist position because they provide evidence for an embodied mind where human intellectual capacities, or reason, are not independent of human bodily experiences, such as sensorimotor experiences (Lakoff & Johnson 1999:17). Conceptual metaphors show the human mind is embodied, as opposed to disembodied with a separation of the mind from the body, because primary metaphors, which form the basis for many complex metaphors, are rooted in strong correlations with our sensorimotor experiences (Lakoff & Johnson 1999:56). These correlations or mappings of primary metaphors are fixed, and processed automatically, not as inputs and outputs, because they are so strongly correlated in experience (Lakoff & Johnson 1999:57). Proponents of CMT claim the fixed nature of primary metaphors is also suggested by neural modeling developed by Feldman (2006), Regier (1996), Bailey (1997), and Narayanan (1997) (Lakoff 2008:17-38). These models are not based on neurophysical evidence, like MRI’s, but are argued to be suggestive because they can model both sensorimotor functions and conceptual ones, suggesting the use of sensorimotor operations in conceptual tasks (Lakoff & Johnson 1999:38).

The experientialist position of truth is thus supported then because concepts are rooted in our individual bodily experiences via metaphor and these experiences are similar across people, languages, and cultures (Lakoff & Johnson 1999). Concepts being biologically based allows them to be partially factual; otherwise, we would not be able to function in our environments (Lakoff & Johnson 1999:21). However, concepts are also not entirely objective, or a direct reflection of reality, because they are still rooted in our individual experiences (Lakoff &
Johnson 1980:119). Truth is consequently redefined in CMT from propositions matching an externally knowable reality to being relative to a conceptual system, largely the metaphorical conceptual system (Lakoff & Johnson 1980:59). More precisely, a statement is true when our understanding of that statement matches our understanding of a situation, both of which are often metaphorically structured (Lakoff & Johnson 1980:79).

5 Responses to Conceptual Metaphor Theory

Conceptual Metaphor Theory has shaped much of metaphor research today through both critical and positive responses to it. This section reviews some of these responses. Section (5.1) reviews overarching theoretical criticisms of CMT. Section (5.2) reviews psycholinguistic and language acquisition studies which have broadly aimed to test CMT’s claims of the conceptual nature of metaphor. Section (5.3) reviews corpus linguistic and discourse studies of metaphor which broadly aim to refocus the study of metaphor on its use in its discursive contexts. Section (5.4) reviews some of the rich research on metaphor variation across languages, cultures, time periods, modalities, and media that have provided a deeper understanding of possible metaphorical structures and challenge the universalizing tendency of CMT.

5.1 Theoretical Criticisms

There has been much theoretical criticism that CMT does not provide substantial evidence or a clear methodology to support its claims. As discussed in the previous section, CMT’s method for metaphor identification is based on whether there is a cross domain mapping, rejecting both the literalness criteria and linguistic criteria for metaphor identification. Thus, it has been claimed that CMT’s methodology ultimately rests on the intuition of the researcher to
not only identify metaphors but what metaphors mean and their semantic structure (Jackendoff & Aaron 1991:324; Ortony 1988:99-100). Data collection and analysis procedures have also not been transparent or agreed upon (Gibbs 2011:533; Jackendoff & Aaron 1991:324; Ortony 1988:99-100). Using intuition as a methodology leaves unexplained how to identify which domains are involved in a given metaphor and determining the level of generality or specificity of those domains (Gibbs 2011:534). Additionally, it has not been agreed on what counts as a metaphor at the word or phrase level, what standard to judge whether a group of utterances has the same underlying metaphor, and how to create a representative sample when examples are constructed or pulled out of context from a corpus (Gibbs 2011:534). Corpus studies also complicate CMT analyses by showing linguistic forms do play a role in metaphorical constructions, demonstrating that grammatical constructions sometimes link the same lexical items to different metaphors (Gibbs 2011:535). Corpus linguistic research on metaphor is discussed more in section (5.3).

It has also been argued that analyses in CMT are largely circular with no real semantic primitives, with metaphorical language both providing evidence for and being explained by metaphorical concepts (McGlone 2011: 566–567). Such intuitions about what metaphors mean are not necessarily identical to how they are being cognitively processed, something only psycholinguistic tests can show, discussed in the next section (5.2) (McGlone 2007:115). Further, CMT’s claims that there is no such thing as a ‘dead’ metaphor, and that they are still cognitively processed as metaphors, has been tested in psycholinguistic studies.

If the methodology of CMT is to use the intuition of the researcher, it becomes impossible to use CMT to analyze languages that are not widely or no longer spoken. Words in one language that appear synonymous to those in another language do not necessarily encode the
same semantic relations. Thus, which elements make up a given domain in one language, culture, or historical context may not be the same as the elements of seemingly identical domains in another. Further, most CMT research has focused on English and other dominantly spoken languages, making generalizations from these results unsound. Anthropologists and other researchers have thus found the lack of consideration of the socio-historic context in CMT analyses problematic (Gibbs 2011:543, 550; Holland 1982; Kimmel 2004). Specifically, it has been argued that all experiences are shaped in a cultural perspective and thus CMT’s claim that some experiences are more biologically based, or universal, than others is problematic (Holland 1982:292; Kimmel 2004:286-288). Consequently, CMT’s unidirectionality hypothesis is dubious, since it rests on there being biologically based concepts that are not structured by other concepts (Holland 1982:292; Kimmel 2004:282). Such issues, like whether metaphors are always unidirectional, must be tested by robust analyses from a wide variety of languages, cultures, time periods, and even different modalities and media. Research documenting metaphor variation is discussed in section (5.4).

5.2 Psycholinguistic and Language Acquisition Studies

As noted above, psycholinguistic experiments that use nonlinguistic evidence have aimed to test the intuitions of CMT researchers that are the basis of CMT analyses. Gibbs (2011:543-544, 2013:46-48) summarizes what questions psycholinguistic experiments aim to address, “(1) Are conceptual metaphors used in understanding linguistic metaphors? (2) If so, are they also used in speakers’ online production and understanding of linguistic metaphors? and (3) What role do our physical experiences of the world have to do with the understanding of linguistic metaphors? Our conceptual metaphors grounded in these experiences, making most of our
concepts ‘embodied’?” Questions (1) and (2) are distinct because a speaker may have an understanding of how a linguistic metaphor’s meaning is based on a conceptual metaphor upon reflection, but this understanding may not be used during actual speech production and comprehension.

Studies on idiom comprehension provide mixed answers to question (1). First, Hamblin and Gibbs (1999) demonstrated that although idioms’ meanings may not be completely decomposable, they are not truly ‘dead’ either, with speakers having some sense of what parts of an idiom contribute to its overall meaning. Hamblin and Gibbs (1999) showed that speakers judge idioms whose verb is replaced with another that expresses a similar manner of action as more synonymous to the original idiom’s meaning than a verb that expressed a dissimilar manner of action. Second, Nayak and Gibbs (1990) found that participants were more likely to complete texts with linguistic metaphors that used the same presupposed underlying conceptual metaphors used in the given text, than those that did not use the same underlying conceptual metaphor but discussed the same topic. Third, Gibbs and Ferreira (2011) found that speakers did process at least some of the metaphorical entailments of a supposed conceptual metaphor, even when it was not linguistically represented.

However, Glucksberg, Brown, and McGlone (1993:712) argue that the results from these studies could come from lexical priming, where participants merely pick the best stylistic choice. Another study by McGlone (1996) suggests that participants may not use conceptual metaphors at all, because when asked what a given metaphor meant, participants pointed to shared attributes between source and target domains as opposed to referencing some underlying conceptual domain. In contrast, a study by Thibodeau and Boroditsky (2011) suggests that lexical priming may not be an issue in previous studies. Thibodeau and Boroditsky (2011) gave participants a
passage that used metaphors with either the source domain of viruses or beasts to describe the target domain of crime, and then asked participants what the government’s response should be. Thibodeau and Boroditsky (2011) argue the participant’s responses were consistent with what metaphor was used in their text. Thibodeau and Boroditsky (2011) thus show that conceptual metaphors are at least used in deliberate (offline) reasoning, even if the participants were unaware of this. With natural responses from the participants as evidence, the study does not allow for the possibility of lexical priming.

Studies attempting to provide an answer to question (2) mostly involve using reading times to determine whether metaphorical statements are processed more quickly, at the same speed, or more slowly than their non-metaphorical counterparts in a given text. Glucksberg, Brown, and McGlone (1993) found no significant difference in reading times between metaphors that were consistent with a text and those that were not, suggesting that conceptual metaphors are not stored in memory and automatically processed (online) in speech production and comprehension. Similarly, McGlone and Harding (1998) found that reading times were equivalent for conventional metaphors and their literal counterparts. Keysar et al. (2000) found that reading times were faster when the metaphors were novel, as opposed to conventional, suggesting that conceptual metaphors operate when novel metaphors are used. In contrast, Gibbs (1980) demonstrated that an idiom’s conventional meaning is processed more quickly, and thus first, as opposed to being established from an idiom’s literal meaning, which had a longer reading time.

A few studies have addressed question (3) - whether our knowledge and memory of physical, sensory-motor experiences are accessed when linguistic metaphors are processed. For example, Boroditsky and Ramscar (2002) primed participants with sentences that evoked actual
motion or talked to speakers who had just experienced motion (from a plane or train) to judge ambiguous sentences about time. The sentence could be understood to evoke two alternative variants of TIME IS MOTION, with either time or a person moving across a landscape. Boroditsky and Ramascar (2002:188) found that actual physical motion was not necessary or sufficient to evoke a given metaphor for time but thinking about motion was both necessary and sufficient. Boroditsky and Ramascar (2002) suggest that target domains are thus built upon concepts of source domains, but not from the actual processing of the experience itself.

Given the differing results of many psycholinguistic studies, Gibbs (2013) critiques and provides further insight on psycholinguistic data about metaphor. Gibbs (2013:46) suggests that various experimental designs are the cause of differing results. The studies do not isolate or control demographic variables of their participants, such as age, gender, etc., or provide full consideration of the kinds of language materials, methods, and participants’ understandings of experimental tasks when analyzing results (Gibbs 2013:49). Instead of dismissing these results though, Gibbs (2013:49) argues that the differing results point out that metaphor processing is much more complex than previously realized, and that greater consideration of linguistic and social context and participant background will show how different, interacting constraints are at play during metaphor production and comprehension.

Few language acquisition studies with children have been done but are also suggestive in answering question (3). Johnson (1999) determined that metaphor acquisition takes place by the child first conflating two separate semantic domains and then later separating these two domains. For example, a child would only use a verb like see for scenarios where physical sight and knowledge are both applicable and then later would be able to use see for scenarios where no physical sight was involved (Johnson 1999). Lakoff and Johnson (1999:48-49) argue that
Johnson’s (1999) results suggest an embodied nature for metaphors, which are grounded in the actual experience of the conflation of two domains before they are extended metaphorically to cases where only the target domain is experienced. Floyd and Goldberg (2019) have also found that children learn polysemous vocabulary at a quicker rate than those that only have one semantic sense, showing such vocabulary is useful in language learning. This may have relevance for understanding metaphorical processing, given that multiple senses of a word often evolve from metaphorical extensions.

Vosniadou and Ortony (1982) worked with children from ages 3-6 years old to test if they could distinguish between literal, metaphorical, and anomalous (not clearly literal or metaphorical) kinds of sentences. Vosniadou and Ortony (1982:11, 17) found that all children could distinguish the anomalous from the metaphorical and literal, and at age four all children could distinguish metaphorical and literal statements. At four years of age, children are thus aware that source and target domain words are not from the same semantic category (Vosniadou & Ortony 1982:15). Vosniadou and Ortony (1982:12) also found that there was not a preference for literal over metaphorical statements at any age, rejecting the notion that one is acquired before the other.

5.3 Corpus Linguistics & Discourse Studies on Metaphor

In response to CMT and psycholinguistic studies, corpus studies of metaphor aim to examine metaphor through actual examples used by speakers in their discursive context, finding invented examples do not normally match actual patterns of language use (Deignan 2008:281). Specifically, these approaches contend that artificial examples may alter reading times in psycholinguistic studies, and thus may not accurately reflect the nature of metaphorical
processing (Deignan 2008:284-5). Corpus research accomplishes this through using large bodies of natural spoken or written texts that are representative of a given linguistic variety, are unbiasedly sampled, and analyzed statistically to understand patterns in language use (Deignan 2008:281). Corpus research also incorporates some qualitative analysis through examining narrow windows of surrounding speech of a given linguistic pattern. Details about actual metaphor use demonstrate their frequency and the presence and structure of different metaphors, which is essential information if one is to posit metaphors are fundamentally conceptual and structure the way we think on a daily basis (Deignan 2008:281).

Corpus approaches have aimed to make metaphor identification an inductive process, reliable across researchers, and valid (Steen 2017; Steen et al 2010). The Pragglejaz research group’s method is widely used and identifies metaphors based on whether a given lexical item is used metaphorically, despite acknowledging metaphors may ultimately be conceptually, and not lexically, based (Steen 2010:5-6; Steen 2017). Broadly, a lexical item is marked as metaphorical if it has a more concrete, precise semantic sense or one related to bodily action, in other contexts (Steen 2017; Steen et al 2010:5-6, 11). Sometimes researchers also examine morphological or syntactic patterns, though the lexical level is viewed as the best way to examine the structure of metaphors because of its direct relationship to conceptual structure (Steen et al. 2010:12). Corpus approaches to metaphor identification and analysis can either be carried out manually or through the use of search engines (Deignan 2008:283). Non-manual searches may involve examining word association measures of source and target domain vocabulary, such as collocations (words that occur more frequently together than apart) (Deignan 2008:283; Oster 2010). Another approach identifies metaphor through topics and foci of a text that have incongruent semantic domains (Strzalkowski et al 2013). Shifts in the semantic domains of topics and foci of a given
text suggest implicit comparison or some relationship between these two domains (Strzalkowski et al 2013). This approach is useful because the comparison or relationship between two domains is marked in the text itself, whereas with the Pragglejaz method one must look to sources outside of the text for interpretation.

Corpus researchers also debate whether it is possible, necessary, or productive to identify the actual conceptual mappings when a metaphor is identified (Steen et al. 2010:12; Shutova et al. 2013). Much previous research that has identified the mappings of conceptual metaphors have used Lakoff’s Master Metaphor List of pre-identified metaphors, not allowing for the discovery of new metaphors or for the master list to be tested (Shutova, Devereux & Korhonen 2013:1265). Shutova, Devereux, and Korhonen (2013:1275) tested the validity of the list by having human annotators come up with their own descriptions of conceptual metaphors and found similar agreements across annotators, suggesting the possibility of identifying which conceptual metaphors are represented by a given piece of language. Shutova, Devereux, and Korhonen (2013:1276) also found that Lakoff’s Master Metaphor List was problematic because it did not contain all possible metaphors, overestimated the frequency of some, or had inconsistent or overlapping uses of domain names. Shutova, Devereux, and Korhonen (2013:280) thus suggest that domains have more fuzzy boundaries and operate as networks, as opposed to having precise levels of generality and specificity. Alternatively, Kimmel (2012) advocates for using a multitier coding scheme for labeling metaphors, which allows annotation of whether a metaphor may represent a more general or specific instantiation of a conceptual metaphor and can be updated and revised as one works through a text (Kimmel 2012). Additionally, corpus research has also examined how to identify whether a given metaphor structures thinking about a topic. For example, Lederer (2016:1259-1260) has been suggested that metaphors for a certain topic must
be more frequent than in the given speech community if it structures thinking about a topic in that community.

Through its methods, corpus research has challenged several CMT’s claims. For example, corpus research has demonstrated that several identified metaphors may not be metaphorical at all because presumed metaphorical vocabulary no longer has its original, nonmetaphorical sense (Deignan 2008:287-288). Additionally, metaphorical senses are often grammatically distinct from their original nonmetaphorical senses, demonstrating a part of speech shift or more restricted use of grammatical inflections (Deignan 2008:287-288). These grammatical shifts entail that relationships between entities from source and target domains are not analogous, or represent one-to-one correspondences, as CMT suggests (Deignan 2008:291-292). This finding thus challenges the fundamental structure of what mappings are, as proposed in CMT (Deignan 2008:291-292). Other corpus research has examined the role of grammar in metaphor, finding nominal vocabulary of metaphorical constructions more pragmatically marked than their verbal counterparts (Goatly 1997). Corpus research on grammatical variation in metaphor, however, has noted that such nominal forms, and additionally adjectival and adverbial, forms of a given metaphor are rare, with verbal forms accounting for over half of metaphorical uses (Cameron 2003). This suggests that nominal forms of metaphorical constructions that are prevalently cited in CMT research have been overemphasized. Furthermore, these studies have challenged the CMT claim that there is no relationship or role of linguistic form in metaphorical constructions.
5.4 Research on Metaphor Variation

This section discusses a variety of studies, done from a variety of different fields and methodologies, that have discussed metaphor variation and resisted CMT’s universalizing tendencies. Section (5.4.1) discusses anthropological approaches to metaphor. Section (5.4.2) discusses discourse approaches to metaphor. Section (5.4.3) discusses historical approaches to metaphor. Section (5.4.4) discusses multimodal approaches to metaphor.

5.4.1 Anthropological Approaches to Metaphor

Kimmel (2004) provides a positive account of the use of metaphor for anthropologists that acknowledges universals and cross-cultural and linguistical variation. Kimmel (2004:275, 289-290) argues that metaphor is just one kind of cognitive schema that a person may use, and other cultural schemas come into play in human action and the material products of culture. Kimmel (2004:276-279) also notes that metaphors can act as shapers of ideology, can overlap or be contrary with other cultural models, and can act as a subversive tool. Further, Kimmel (2004:280-284) details possible differences across cultures in metaphor use, such as: what kinds of source domains are commonly used, what targets they are paired with, the directionality between those domains, what elements are mapped from one domain to the other, the experiential basis for those metaphors, and their societal evaluation. Given this variation, Kimmel (2004:283-293) argues that the quest for metaphorical universals is merely an abstraction, and that to truly understand metaphor one must analyze what it does in a particular context and in relation to other tropes and schemas.

A few exemplary studies that aimed to capture the cross-cultural and cross-linguistic variation of metaphor are discussed here. First, Yu (2003) demonstrates that while conceptual
metaphors and mappings may be similar cross-linguistically and cross-culturally, culturally specific concepts affect how these metaphors materialize. Specifically, Yu (2003) finds Chinese has the metaphor **THE MIND IS A BODY**, like in English, but the heart is conceptualized as the organ that hosts both thoughts and emotions in contrast to English, where the heart hosts emotions and the brain thoughts. Taljard & Bosman (2014) use a corpus approach to compare uses of the domain **EATING** in metaphorical constructions in Afrikaans and Northern Sotho. Similar to Yu (2003), Taljard and Bosman (2014) show similar uses of domains in metaphors cross-culturally, though also demonstrate that there may be variations of specific mappings. In contrast, Burkhart (1988) demonstrates that differences in cultural concepts affect the interpretation of metaphors and cannot easily be translated cross-culturally through examining colonial Spanish and Nahuatl religious texts. Specifically, Burkhart (1988) demonstrates that colonial Spanish solar metaphors for Christ were understood through Nahua conceptualizations of the sun, and their solar deity. Finally, Özçalişkan (2004) notes the effect of grammatical structures available in a language on metaphor use through an examination of English and Turkish. Though English and Turkish both have the metaphor **TIME IS MOTION** on a landscape, English and Turkish speakers showed differences in the manner of motion in which time could move (Özçalişkan 2004). This corresponds to differences in the grammatical structures of English and Turkish. Specifically, English is a manner encoding language where verbs frequently encode the manner in which a motion or action takes place. In contrast, Turkish is not a manner encoding language (Özçalişkan 2004).
5.4.2 Discourse Approaches to Metaphor

Discourse approaches to metaphor similarly acknowledge that the frequency and presence of various metaphors are also influenced by linguistic, cultural, genre, and ideological contexts (Deignan 2008:287-290; Deignan 2005; Kövecses 2010). Discourse approaches also aim to examine the role of metaphor and its variation in actual discursive contexts, finding pragmatic factors significant in the study of metaphor, counter CMT (Deignan 2005; Deignan 2008: 287–290; Kövecses 2010). It has been broadly found that metaphor is one way in which intra- and intertextual coherence is achieved across texts, providing framing of a topic through highlighting certain aspects of that topic and hiding others (Deignan 2008:287-290; Deignan 2005; Kövecses 2010). This metaphorical framing can also be challenged (Deignan 2008:287-290; Deignan 2005; Kövecses 2010).

Several studies are exemplary of work on discourse and metaphor, while also integrating corpus techniques. Charteris-Black (2012) used corpus and discourse techniques to examine differences in men’s and women’s use of metaphor in the discussion of depression. Charteris-Black (2012) found that men and women used similar metaphors for depression, but deployed them differently in discourse, with women mixing metaphors more to elaborate their responses. This study significantly shows that even if metaphors are similar across groups, they may be used and treated differently in context. Deignan et al (2019) demonstrate there is variation of metaphor usage across genres using corpus and discourse methods. Specifically, Deignan et al (2019) examined differences in metaphors for climate change between children’s speech, educational materials, and scientific research. Deignan et al (2019) noted that children may interpret metaphorical references literally based on the educational materials they receive, and thus extend metaphorical uses from scientific research beyond their intended use. Deignan et al
note these differences in metaphor interpretation are problematic, and lead to poor understanding of science by children.

Discourse research on metaphor also extends to political speech. Arcimaviciene and Baglama (2018) have demonstrated the role of metaphor in creating centralizing myths for political ideology. Using a discourse and corpus approach, these authors demonstrate that the media has dehumanized immigrants by using metaphors that have framed IMMIGRANTS as OBJECTS or COMMODITIES, while perpetuated stereotypes of immigrants as a societal threat through metaphors that framed IMMIGRANTS as NATURAL DISASTERS, CRIMINALS, or TERRORISTS and that such metaphors were used to justify policies that mistreated immigrants. Similarly, Musolff (2017) characterizes competing political ideologies through variation of metaphor use. Through a corpus and discourse approach, Musolff (2017) demonstrated that positive metaphors for the United Kingdom’s role in the European Union were derided through metaphorical extensions, in an aim to encourage the United Kingdom to leave the European Union.

5.4.3 Historical Approaches to Metaphor

Some researchers have also tried to address CMT’s claims through application to linguistic history, using metaphor to explain language change or justify interpretations of historical texts. Many historical metaphor accounts have hypothesized about a language’s history and metaphor’s role in human cognition through examining polysemous words. It is argued that polysemous words are records of the past because different senses of a word must be related by some principle, rule, or structure and are not randomly affiliated (Sweetser 1991:9). Specifically, a word’s meaning often gains new senses through metaphorical extension, extending the meaning from one domain to another (Sweetser 1991:19). Senses relating to physical states are
more often older than senses that structure abstract senses, such as mental states (Sweetser 1990:19). This relationship between semantic senses is argued to affirm the unidirectionality principle of CMT and that humans use their understandings of the physical world to understand more abstract domains (Sweetser 1991:19). Sweetser (1991:23-48) provides an example of this approach by examining perception verbs in the Indo-European family and finding that they are frequently extended metaphorically to have senses related to mental states. Haser (2003) expands this approach by examining languages from around the entire world and more semantic domains to determine regular pathways of semantic change. Further, through an examination of Mixtecan languages, Hollenbach (1995) has shown that metaphorical extension not only plays a role in semantic change but syntactic change as well. Hollenbach (1995) demonstrates how body part nouns were extended to reference parts of objects, spatial relationships, and subsequently used as prepositions and complementizers.

Other historical accounts have appealed directly to metaphor use in historical texts. Wiseman (2007) examines Latin metaphors for communication in Roman texts to provide an alternative model for why English, and other European languages, might have various structures, given the wide influence Latin has had over time. Wiseman’s (2007) study is important because he challenges synchronic CMT analyses that cannot locate clear motivations for metaphors and ultimately rest on a researcher’s intuition. Wiseman (2007:44, 68) demonstrates metaphor use was motivated by cultural-historical beliefs about the body in Rome, a given genre’s social use, and considers the frequency of different metaphors for communication in Roman society. Lastly, Wiseman (2007:48) considers why only certain words from a given semantic domain were used in these metaphors, arguing the cultural context of actual communication selected for certain words over others. Singerland (2004) applies CMT to Classic Chinese texts that use metaphors
for the self, arguing that CMT can provide a clear model of cultural-historical similarities and differences by analyzing the schemas, mappings, or domains underlying metaphors. Slingerland (2004:336) thus argues metaphor analysis makes cross-cultural and historical analyses simpler and more systematic. Another relevant study of metaphor in historical texts is by Goldwasser (2005), who analyzed elements of the Egyptian hieroglyphic script itself as functioning metaphorically. Goldwasser (2005) significantly shows how metaphor analysis can be applied to symbolic systems other than spoken languages.

5.4.4 Multimodal Approaches to Metaphor

As noted in section (5.1), CMT has employed mostly circular reasoning with linguistic structures being evidence for human conceptual structures and explained by these very structures. Multimodal approaches to metaphor have thus taken up CMT’s claim that if metaphor is conceptual, and not tied to any given form, then metaphor should occur across modalities in both monomodal and multimodal contexts (Cienki & Müller 2008; Forceville 2009:487-493). These researchers contend such multimodal evidence would affirm the conceptual nature of metaphors and provide more evidence for the structure of metaphors, contending the medium of a message alters its meaning (Forceville 2009:19-21; Cienki & Müller 2008:487-493). This is counter to CMT's claims that metaphorical structure will be the same cross-modalities, given its conceptual nature. Further, Forceville (2009:19-21) also argues that multimodal studies of metaphor are significant because verbal labels of metaphor may have connotations not implied in other modalities. Multimodal metaphor research has been done on a variety of modalities and media, including pictorial images, gestures, film, and others, and addressed specific issues in CMT, a few of which are discussed here.
Work on metaphors in pictorial images has specifically challenged CMT’s unidirectionality hypothesis and questioned how one identifies source and target domains in pictorial images. This is because pictorial images do not necessarily have a linear reading order or specific forms that might indicate the subject, and likely target, of a text, as is true of spoken language and writing (Carroll 1994; Indurkhya & Ojha 2017). However, Indurkhya and Ojha (2017) have found that even if source and target domains are reversed, they map substantially different elements of the semantic domains involved, discussed more in chapter (5). Further, Forceville (1996, 2009, 2017) has shown that the cultural context and genre of a text plays a large role in helping viewers identify what are the source and target domains. Particularly, Forceville (1996, 2009, 2017) examined visual metaphors and multimodal visual and written metaphors in advertising and showed the target often coincided with the product advertised, which was partially identifiable by the culture of the target audience. Forceville (1996, 2009, 2017) also showcased a variety of different forms of these metaphors, discussed more fully in chapter (5).

Gestural studies have also provided non-linguistic evidence for models of metaphor. Cienki and Müller (2008) explain how gestures interact with linguistic metaphors and thought. Cienki and Müller (2008:493-495) argue that gestural metaphors provide evidence that (1) metaphor is based in thought and not a particular physical modality, (2) that linguistic metaphors are not necessarily ‘dead’ because they are enacted in gesture, and (3) that metaphors are embodied because many gestural metaphors enact physical properties from source domains. Gestural metaphor studies also highlight that the modalities a metaphor is expressed in do not always align (Cienki & Müller 2008:487-493). Specifically, a conceptual metaphor may be present in gesture but not speech, or vice versa, and different metaphors may be occurring in
both speech and gesture (Cienki & Müller 2008:487-493). Additionally, Núñez and Sweetser (2006) demonstrate some of these points about metaphor in gesture in a study about metaphors for TIME with Aymara speakers in the Andes. Aymara speakers have linguistic metaphors for TIME that diverge from common metaphors in other languages by mapping the future in the back of a speaker and the past in front of the speaker and gesture according to this mapping (Núñez & Sweetser 2006: 403). Bilingual Spanish-Aymara speakers, however, may have Spanish linguistic metaphors for TIME, with the future mapped in front and the past in the back of the speaker, but gesture according to mappings in the Aymara language. This study thus demonstrates that the modalities of gesture and speech can diverge, challenging CMT notions that metaphors will be the same cross-modalities (Núñez & Sweetser 2006:438).

6 A Mixed-Methods Approach

The above sections demonstrated that metaphor research, including in Mayan hieroglyphic texts, has varied widely in its aims, methodologies, and claims. Section (6.1) discusses this study’s overall methodologies based on the aims of this study and addressing some of the shortcomings of other research on metaphor and in Mayan hieroglyphic texts. Section (6.2) discusses the corpora used for this study and this study’s general approach to sampling them. More details on the methodology used in this study are discussed in chapters (4-6) as relevant to the data discussed in those chapters.

6.1 Bridging Modalities and Media

As noted in section (2.1), previous approaches to Mayan hieroglyphic texts have afforded a limited view of these texts, and limited potential for research on metaphor. A focus on
decipherment approaches may have limited an examination of metaphor altogether, focusing on the literal, historical referents of texts, often to exclusion to how the texts were used with specific social motivations. Further, such an approach limits understanding of texts where the meanings represented may be expressed indirectly or be abstract. Rhetorical approaches to these texts have acknowledged how language was used to frame pre-Columbian Mayan history and successfully documented variation of some of these rhetorical forms, including some kinds of metaphor. Other research on metaphor in Mayan hieroglyphic texts have begun to discuss the symbolism behind supposed metaphors and of their conceptual underpinnings. These approaches have afforded a limited view of metaphor though and are thus unable to expand documentation of metaphor variation across various variables, such as different modalities, media, space, and time.

Using explicitly developed frameworks for metaphor research can help document a richer picture of metaphor variation in Mayan hieroglyphic texts, but the previous sections (3-5) showed these approaches were not unproblematic. Instead, this study develops a mixed-method approach for metaphor research that aims to remedy the shortcomings of various approaches to metaphor in order to document metaphor variation. Specifically, the methodologies used here aim to capture how precisely metaphor materializes across modalities, media, space, and time in Mayan hieroglyphic texts. Although a rhetorical approach to metaphor emphasizes its physical manifestation, this approach has limitations in understanding metaphor. Viewing metaphors as merely special rhetorical forms existing in language alone is problematic because it entails that metaphors are ultimately synonymous to literal expressions and that language use does not affect cultural beliefs. Further, if metaphor is to be defined by having certain linguistic forms, it is impossible to document how these forms may vary.
Instead, a definition of metaphor must be able to provide integrated analyses that bridge modalities, media, and other variables. This study thus adopts a conceptual definition of metaphor adapted from Conceptual Metaphor Theory. Though CMT defines the conceptual basis of metaphor as ‘understanding and experiencing one kind of thing in terms of another’ [emphasis added], this study does not take a stance on the psychological states involved in metaphorical comprehension, given conflicting results from psycholinguistic studies (Lakoff & Johnson 1980:5). However, it is clear that language broadly, and metaphor specifically, influences how one reasons about the world, as shown by Thibodeau and Boroditsky (2011) discussed in section (5.2). This study adopts a weaker conceptual definition of metaphor where metaphor is, at the least, the use of one semantic domain, or concept, to provide semantic structure for another. With a conceptual definition of metaphor, a single metaphor can underlie divergent forms of expressions across different modalities, such as in language, the visual arts, and gesture. This conceptual definition is thus necessary because other views of metaphor cannot explain the continuities of meaning in multimodal texts or across texts, nor capture metaphor variation across different variables. Further, as was noted in section (3.3), Black (1955) notes we can readily identify metaphors and their meaning out of their context of use, showing metaphorical structures can exist apart from a specific kind of form or content.

Using CMT as a basis for a study of metaphor variation is also useful because CMT detailed more about how metaphors work and different kinds of metaphorical structures than any of its precursors. There is strength in CMT’s explanation in that it strives for a systematic explanation across various linguistic metaphors. A good account does not just particularize explanations of phenomena when the phenomena in question do not fit a wider theory. Rhetorical approaches that rest on reducing metaphor to literal referents provide no such basis or
framework to discuss and test accounts of metaphorical structure. Further, many critiques of CMT simply fall flat in the scale of positive explanation they provide to account for metaphor. Though it has been amply noted by responses to CMT discussed in sections (4-5) that CMT’s accounts may be truly flawed, they still provide a firm starting point to test new accounts of metaphor. Numerous CMT claims about how metaphors work and their structures will be tested here through documenting metaphor variation.

This study looks apart from CMT in establishing how it will document metaphor variation since CMT does not provide a clear methodology to search for metaphors or identify them and their structures. In contrast to CMT, this study adopts a mixed-methods approach that integrates corpus linguistics and discourse analysis and can systematically document the variable uses of metaphor across modalities, media, times, and places, while also documenting how such meanings are integrated. This study used discourse analysis to both design effective corpus searches and to help understand the context of use of the conceptual metaphor analyzed in this study, RULERS ARE TREES. As was noted in section (5.3), corpus techniques are effective for systematically reviewing large bodies of data through statistical analysis. However, corpus techniques do not provide the entire context of examples, with only a limited window of the discursive context before and/or after the search term provided.

Understanding the full discourse context helps search for conceptual metaphors since they do not necessarily take a specific, searchable form in any given modality. Doing discourse analyses of parts of a corpus prior to doing automated searches thus helps avoid imposing presuppositions on data by providing this context. The metaphor RULERS ARE TREES was thus selected on the basis of a previous discourse analysis done by the author on a small set of multimodal texts from the Cross Group monuments at the site of Palenque, in Chiapas, Mexico.
The analysis showed usages of the metaphor unexamined by other scholars and formed the basis for determining the corpus searches done in this study. Given that many of the written corpora used in this study had to be manually searched, variation of the metaphor as it materialized in writing is also discussed through previous research, and what has been attested in hieroglyphic dictionaries. Most of the searches for the metaphor in pictorial images were manually done, with few automated options available.

A Bakhtinian approach to discourse analysis as outlined by Wortham and Reyes (2015) was also used because this approach can analyze discourse across different texts, whether spoken or written, to better understand a metaphor’s socio-historic context of use and meaning, its evolution, and its effect on grammar. This style of discourse analysis traces how texts and their linguistic patterns become associated with certain social meanings and social identities and are repeated, reified, and changed as they are used in different speech events, or social contexts. Typically, approaches to discourse analysis are limited to a single text that is produced in a single speech event. Being able to analyze how discourse is used across texts and speech events is essential in understanding language’s role in socialization and social action, as these processes do not occur in isolated events (Wortham & Reyes 2015:1). This approach can be applied to historical texts to trace how the social meanings behind certain kinds of speech change over time and the role of wider socio-historic processes in linguistic change. For example, Wortham and Reyes (2015:110-126) apply their approach to Inoue’s (2006) work on the evolution of Japanese women’s language and its connotations for women’s identities in the nineteenth and twentieth centuries. They demonstrate how the speech of geisha, which was considered vulgar, was transformed over time to be considered proper, feminine language, as Japan was transformed into a capitalist society and gender identities were changing (Wortham and Reyes 2015:110-
This study expands Wortham and Reyes’ (2015) approach to specifically understand the role of metaphor use and variation in linguistic change. Further, how pictorial images coupled with such discursive patterns were also analyzed, given the multimodal quality of the texts analyzed in this study.

To identify if a given example was metaphorical or meets the definitional criteria of the *use of one semantic domain, or concept, to provide semantic structure for another*, several criteria were used. Similar to the Pragglejaz methodology, linguistic metaphors were identified lexically when a lexical item used in the discursive context examined had a more abstract, vague semantic sense compared to its use in other contexts where the lexical item had a more concrete, precise semantic sense, or related to bodily action. Strzalkowski et al.’s (2013) methodology of using shifts of referents in topics and foci was also considered, given that Mayan hieroglyphic texts often omit grammatical arguments, and referents are implied based on this pragmatic marking. The frequency of a given usage and its discursive context were used to approximate if a polysemous word indicated an active or ‘dead’ metaphor. This can be difficult to determine, especially in historical texts, but given that this study examines mostly novel metaphorical constructions and their variants and history, the examples discussed seem to have been actively metaphorically processed. Metaphors in pictorial images were identified through the superimposition or fusion of elements from two distinct semantic domains, given that this represents a sharing of semantic structure across domains to reference one entity. Other kinds of visual metaphors were not identified because too much of the historical context of a given text was required to be known to systematically identify these metaphors at a large scale. A future study may address these kinds of metaphors. Metaphor identification is discussed more in chapters (4-6).
Unlike CMT, the semantic structure, or mappings/entailments, are not assumed and only discussed when there is direct evidence for a given mapping through an attested example. Assuming the nature of mappings of a conceptual metaphor is an imposition of the researcher from their historical and cultural background. Further, an outcome of documenting metaphor variation shows that although examples of a metaphor may utilize the same source and target domain in similar ways, variation of mappings may show differences in what semantic structure is shared across uses. These uses are coherent with each other but do not express compositional meaning where different mappings express an analogically consistent relationship between domains. CMT diagrams mappings compositionally, despite professing the structure of these mappings are merely coherent. Metaphor labels, such as RULERS ARE TREES, are thus viewed as reconstructions to account for all such metaphor variation, as discussed by Kimmel (2004, 2012). Diagrams of such mappings, as done in CMT, are thus not provided. This issue is discussed in full in chapter (5).

6.2 Corpora and Sources

Part of corpus research is ensuring the quality of the data that is in a given corpus. Ideally, a corpus would be both representative of the given linguistic variety it contains and have a balanced number of examples from various subcategories of the corpus. Given the limited availability of corpora of Mayan hieroglyphic texts, series of corpora and complementary sources were used, many of which had to be manually searched and cataloged. The available corpora of Mayan hieroglyphic texts are by nature not truly representative of the language of the speakers who made these texts, given that the texts were mostly used and circulated by Mayan elites for specific political and ritual purposes. The available corpora are thus specialized,
representing select genres of texts from a limited group of people in a specific time period. This study is thus, by default, limited to studying this genre of texts as used by pre-Columbian Mayan elites. This study attempted to take a balanced sample across the various modalities, media, and places examined here. Given the results of the study, the sample mainly consisted of Classic period texts. Given that corpora of Mayan hieroglyphic texts are historical and specialized in nature, and may have to be searched manually, supplementary sources and techniques (such as discourse analysis just discussed) were also used. Thus, this study is a corpus-assisted one. This contrasts with corpus-driven studies where a corpus alone is used to inform what searches are done and all examples examined are randomly selected. Chapters (4-6) thus explain how corpus searches were designed and ensured that they were systematic.

For the written portion of Mayan hieroglyphic texts, this study used The Maya Hieroglyphic Database Project (Macri & Looper 1990-present), The Primary Standard Sequence Database (Mora-Marin 2004b - updated 2019), and The Maya Codices Database, Version 5.0 (Vail & Hernández 2018). The Maya Hieroglyphic Database Project (Macri & Looper 1990-present) consists of 86,379 glyph block records from the Pre-Classic, Classic, and Post-Classic periods that have been coded for location, date (in both Mayan and Gregorian calendars), and media type. Approximately 71,000 of these glyph blocks come from texts on monumental architecture and portable objects. Approximately 15,000 of these glyph blocks come from three of the codices (the Dresden, Madrid, and Paris), while the Grolier codex is not included because there is disagreement on its authenticity. In contrast, The Maya Codices Database, Version 5.0 (Vail & Hernández 2018) includes the Grolier codex. The updated (2019) version of Mora-Marin’s (2004b) Primary Standard Sequence Database was given to me by the author and consists of 860 vases and other portable objects with the Primary Standard Sequence and any related
secondary texts. This study modified this database to eliminate examples from the Pre-Classic and monumental architecture, amounting to hieroglyphic texts from 801 vases and other portable objects. This study did not examine Pre-Classic examples in this study and analyzed portable objects separately from monumental architecture in the following chapters (4-6). This elimination did not affect any of the search results, discussed fully in chapter (6). This database could be and was modified to be run on the corpus linguistic software package #LancsBox developed at Lancaster University (Brezina, Weill-Tessier, & McEnery 2020) that runs and gives reports of common statistics used in corpus linguistics, as detailed in chapter (6). Only frequencies are reported for data from other corpora used in this study.

For pictorial images in Mayan hieroglyphic texts, this study again used *The Maya Codices Database, Version 5.0* (Vail & Hernández 2018) and complete published versions of the extant codices, *The Maya Vase Database* (Kerr n.d.-b), *The Corpus of Mayan Hieroglyphic Inscriptions* (Flash & Graham 1968-present), *The Linda Schele Drawing Collections* (Schele 2000), *The John Montgomery Drawing Collection* (Montgomery n.d.), and other publications when these sources did not have information on specific sites. Automated searches of pictorial images of trees in *The Maya Codices Database, Version 5.0* (Vail & Hernández 2018) and *The Maya Vase Database* (Kerr n.d.-a) were done given that the databases allowed for automated searches. However, since these sources may have used different coding than how this study was identifying the metaphor **RULERS ARE TREES**, this study also manually searched the above listed sources. Table (3.1) shows the sample size per medium:
Broadly, what was counted as a pictorial image amounted to a single scene, as opposed to aspects of it. However, this is partially dependent on the medium and based on available sources. For vases, a single vase with a pictorial image counted as a single instance, given that there is usually one scene per vase. For codices, a pictorial image was counted as a page containing pictorial images as opposed to just written text. To note though, in the codices separate scenes are often demarcated with red borders for distinct astronomical tables, averaging one to three per page. A defined section of monumental architecture (a stela, wall, staircase, etc.) with a pictorial image counted as a single instance. However, in many cases, this was ultimately determined by how monumental architecture was documented by a given source.

Manual searches of vases were done randomly, whereas the entirety of the extant codices was manually searched given the smaller size of the available sources. A stratified random sample of monumental architecture was done to ensure a balanced number of sites and pictorial images were sampled from each geographic region of the Mayan area, as much as possible. This was not done for vases because their provenience is often unknown. Table (3.2) shows the sample balance for pictorial images from monumental architecture:

<table>
<thead>
<tr>
<th>Medium</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monumental Architecture</td>
<td>884</td>
</tr>
<tr>
<td>(including murals)</td>
<td></td>
</tr>
<tr>
<td>Vases</td>
<td>870</td>
</tr>
<tr>
<td>Codices</td>
<td>206</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>1960</td>
</tr>
</tbody>
</table>

Table 3.1. Sample size of pictorial images per medium.
<table>
<thead>
<tr>
<th>Region</th>
<th># of Sites Available per Region</th>
<th>Region Weight Overall</th>
<th># of Sites Examined per Region</th>
<th>Weight of Sites Examined</th>
<th># of Images Examined per Region</th>
<th>% of Images Examined per Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yucatán</td>
<td>22</td>
<td>21%</td>
<td>11</td>
<td>17%</td>
<td>188</td>
<td>23%</td>
</tr>
<tr>
<td>Peten</td>
<td>30</td>
<td>28.85%</td>
<td>16</td>
<td>24%</td>
<td>175</td>
<td>21%</td>
</tr>
<tr>
<td>Southern Belize</td>
<td>9</td>
<td>8.65%</td>
<td>5</td>
<td>7.58%</td>
<td>33</td>
<td>3.96%</td>
</tr>
<tr>
<td>Pasión Region</td>
<td>14</td>
<td>13.46%</td>
<td>11</td>
<td>16.67%</td>
<td>62</td>
<td>7.44%</td>
</tr>
<tr>
<td>Western Region</td>
<td>27</td>
<td>26%</td>
<td>21</td>
<td>32%</td>
<td>343</td>
<td>41.18%</td>
</tr>
<tr>
<td>Motagua Region</td>
<td>2</td>
<td>2%</td>
<td>2</td>
<td>3.03%</td>
<td>32</td>
<td>3.84%</td>
</tr>
<tr>
<td>Totals</td>
<td>104</td>
<td>100%</td>
<td>66</td>
<td>100%</td>
<td>598</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3.2. Sample balance of pictorial images from monumental architecture.

The sample for monumental architecture consisted of 66 archaeological sites from six geographic regions. The sample tried to maintain the same weight of sites per region as was available while also attempting to sample the same weight of pictorial images per region. The specific sites, instances sampled, and their sources are included in the appendix of this study.

Results from these searches were contextualized using colonial texts given that Mayan hieroglyphic texts as a whole, represent a specialized, rather than a general, corpus. Specifically, comparisons with colonial texts from the Ch'olan language family contextualize findings by providing alternative examples of the phenomena examined here. Though demonstrably colonial in their features, these papers show continuities with pre-Columbian genres, grammar, and vocabulary. Other dictionaries and sources used are discussed throughout this paper when relevant.

First, the only extant text of colonial Yo'kot'an (Chontal) is the Paxbolon-Maldonado Papers and was used in this study in comparison to hieroglyphic examples (1612-1614) (Scholes & Roys 1968: 359). The Paxbolon-Maldonado Papers were originally in the possession of a
native Yokot'an (Chontal) speaker, Pablo Paxbolon, who was the cacique and governor of Tixchel located in present day Campeche (Scholes & Roys 1968:359). Part of the original document, written in 1567, is stated to be written in the ‘Mexican’ language, Nahuatl (Scholes & Roys 1968:361). The original document was copied into Yokot'an (Chontal) with additional materials added by a native Yokot'an (Chontal) clerk in Tixchel (Scholes & Roys 1968:361). The version available today is a copy made by a Spanish clerk of the copy made by the Tixchel clerk (Scholes & Roys 1968:359-360). The Paxbolon-Maldonado Papers were used by Paxbolon’s grandson-in-law to petition the Spanish government for the right to an encomienda and can be categorized as a series of probanzas (Scholes & Roys 1968:359). The papers thus trace the history of the people of Tixchel’s former region of Acalan, including a genealogy of rulers from pre-Columbian to the mid-sixteenth century, a list of the pueblos in Acalan, and a list of events that transpired after the arrival of Cortés and Christianity (Scholes & Roys 1968:363).

Information about genealogy and post-conquest events is claimed to be known from oral tradition (Scholes & Roys 1968:362). The Paxbolon-Maldonado Papers are thus a relevant source discussing similar information to hieroglyphic texts on monumental architecture, and perhaps suggest that there are continuities between oral and written traditions. Further, Acalan was a key location for trade for all of Mesoamerica and thus a multilingual area that may demonstrate wider pan-Mesoamerican ideas (Scholes & Roys 1968:16-24, 28-35).

Second, a historical dictionary of Ch'ol from (Hopkins, Josserand, and Guzman (2011) reliably documents vocabulary from sources in the colonial era around 1789 to the early 2000s and is also used in this study. The earliest extant source used in their study is from León Fernández (1982) who copied an earlier 1789 source, which imaginably was authored by Juan Josef de la Fuente Albones, a priest of Tila in the highlands of Chiapas (Hopkins, Josserand, &
Cruz Guzmán 2011:4). It has been documented that Fuente Albones made a dictionary at the request of the Spanish government in 1789, later published in 1892 (Mateo 2008:2). The dictionary was expanded by Marco E. Becerra in 1937, who added 1000 entries from the towns of Tumbala, Tila, Sabanilla, but also sometimes had inventive etymologies (Mateo 2008:2). Heinrich Berlin added a few entries from Ch'ol speakers around Palenque in 1940 (Mateo 2008:2). Colonial day names come from a document entitled Libro de Bautismos y Casamientos de Yajalón, located in the Archivo de la Diócesis de San Cristóbal de Las Casas, Chiapas as published by Campbell (1984) (Hopkins, Josserand, & Cruz Guzmán 2011:4-5). The next earliest source comes from Starr (1902) who published word lists on Ch'ol but were unfortunately filled with translation and phonetic errors (Hopkins, Josserand, and Cruz Guzmán 2011:9). Sapper (1897) also produced a meticulous word list, demonstrating some phonetic changes over time, much of which is similar to Stoll’s (1884) lists (Hopkins, Josserand, & Cruz Guzmán 2011:6-7). Stoll’s (1884) lists were copied from Berendt (n.d) from the mid-nineteenth century (Hopkins, Josserand, & Cruz Guzmán 2011:5-6). Berendt’s (n.d.) work shows phonetic changes of some Ch'ol vocabulary as well (Hopkins, Josserand, and Cruz Guzmán 2011:5-6). Contemporary sources come from elicitations by Hopkins, Josserand, and Cruz Guzmán (1978-1979; 1985-1987) and Auilie and Aulie's (1978) dictionary (Hopkins, Josserand, & Cruz Guzmán 2011:21-25). Some of these sources have also been compiled by Mateo (2008). These compilations are significant because it may show how senses of given words have changed over time, starting with the colonial period, and thus provide key evidence of metaphoric shift.

Third, the only extant text in the extinct language Ch'olti' is the Morán Manuscript, also known as Arte y Vocabulario de la Lenguage Cholti, from the mid-seventeenth century, which was considered in this study (Robertson, Law & Haertel 2010: 8). The Morán Manuscript is
claimed to be written by the Spanish Fray Francisco Morán (Robertson, Law, & Haertel 2010:14). However, the text was likely copied from other earlier sources and then again copied and added to by other Spanish clergy (Robertson, Law, Haertel 2010:13). The text was written to help convert the Ch'olti' speakers surrounding the mission Santa Cruz el Chol, found in eastern Guatemala and southern Belize, and relied on knowledge of other Mayan languages to complete the work (Robertson, Law, & Haertel 2010:8). The text consists of a history of the founding of the mission, a grammar, and dictionary of Ch'olti', and translations of religious texts from Spanish to Ch'olti' (Robertson, Law, & Haertel 2010:8-13). There is disagreement over the Morán Manuscript’s accuracy or usefulness in understanding Ch'olti’, given that the text is not native authored. This text was examined but did not alter the results of this study. There were no attested examples of key vocabulary used in examples of linguistic metaphors that this study centers on in the Morán Manuscript.

7 Conclusion

This chapter advocated for using a mixed-methods approach that could document how metaphor materializes across different modalities and media, places, and times. This approach integrates corpus linguistics which systematically analyzes variation through big picture statistics and discourse analysis that provides the full context of use of a given example. Specifically, corpus linguistic techniques were used with the addition of a Bakhtinian style discourse analysis as outlined by Wortham and Reyes (2015) that analyzes discourse in context across texts. A weaker version of the conceptual definition of metaphor was also adopted because a conceptual definition allows for variation of metaphor across various variables like modalities, media, places, and times, without commitments to how metaphor is cognitively processed. This
contrasts with other approaches of metaphor that rest on defining metaphor as strictly a kind of rhetorical form that is reducible to literal expressions. However, Conceptual Metaphor Theory, the original proponents of a conceptual definition of metaphor, did not provide sound methodological techniques which ultimately rested on the intuition of the researcher. This methodological flaw as well as other claims in CMT have been taken up by researchers from numerous fields, as will also be done in the following chapters. Chapters (4-6) will demonstrate how metaphor materializes across the modalities of writing and pictorial images, across media, places, and time, and provide challenges to some of the key claims of CMT. Further, these chapters will show that the mixed-methods approach used here also contributes to metaphor research in Mayan hieroglyphic texts, which has used a variety of frameworks that have only afforded a limited view of metaphor – as a rhetorical form, a kind of symbolism, or broadly conceptually based.
Chapter 4 – The Linguistic Shape of Metaphor

1 Introduction

What, exactly is the linguistic shape of metaphor? That is, how does metaphor materialize in language and its representation in the modality of writing? Chapter 3 discussed the necessity of eschewing a linguistic definition of metaphor and adopting a conceptual one, where one semantic domain provides semantic structure for another. But it was also noted that despite accepting a conceptual definition, many metaphor scholars have found correlations between metaphors and specific grammatical forms when compared to non-metaphorical constructions (e.g. Deignan 2005; Sullivan 2009). This chapter examines how the conceptual metaphor RULERS ARE TREES materializes in Mayan hieroglyphic writing. Specifically, this chapter demonstrates how the metaphor uses specific grammatical forms and marks specific semantic relationships in the modality of writing. This chapter shows that noun incorporation on verbal stems and the abstractive suffix –(VV)Vl17, which derives abstract nouns from other nouns and adjectives, are employed with the metaphor. This chapter argues that the use of these grammatical forms with the metaphor is not just a correspondence but is due to features of the genre of Mayan hieroglyphic texts and the nature of the given grammatical function itself. This

17 Mora-Marín with Wiesen (2019) have argued that innovative forms of the abstractive suffix –(VVl)Vl may have originally combined two -VV suffixes. They are glossed as one suffix here since they only have one morphological function. Further, transcriptions only mark –Vl unless there is an overt spelling of another (l) on a given root that is attested in the hieroglyphic corpus, in which case the transcription will be -lVl. The first (VV) is not transcribed because it is often deleted in pronunciation and a determination of when this occurs is still unresolved. Further, for transcriptions of the abstractive suffix –(VVl)Vl this study prioritizes attested examples of the abstractive suffix –(VVl)Vl on a given word root in colonial and contemporary Ch'olan language sources and the grammatical context of use in hieroglyphic examples. Examples of the abstractive suffix –(VVl)Vl in colonial and contemporary Ch'olan language sources will be notated as –(Vl)Vl since these languages do not have vowel length. Likewise, other -Vl suffixes will be notated as such. This transcription method does not affect any analysis of the abstractive suffix provided here.
chapter also demonstrates that the semantic structure of the metaphor in writing is not fully elaborated, given its broad focus on the different stages of the political lifecycle of a given Mayan ruler. This chapter also shows that the metaphorical reasoning behind the metaphor is not fully elaborated in writing by showing that in writing the metaphor merely evidences a coherent semantic structure, and not a compositional one, as is the case when the metaphor is expressed in pictorial images, as discussed in the next chapter. This goes against the tenet of Conceptual Metaphor Theory, known as the Invariance Principle, that claims metaphors are cognitively processed by transferring as much semantic structure from the source domain to the target domain. The analysis presented here also challenges and expands previous interpretations of Mayan hieroglyphic texts by elaborating the relationship between semantic structure and grammatical form.

Section (2) details and justifies how the available corpora for this analysis were searched. Section (3) reviews attested vocabulary from the domain of PLANTS and vocabulary that is used to refer to Mayan rulers from this domain to delimit the possible vocabulary that could have been used in the metaphor RULERS ARE TREES. Sections (4-5) show how metaphor materializes in the modality of writing, or language broadly, through the use of distinct grammatical forms. Specifically, section (4) discusses how the metaphor RULERS ARE TREES materializes through the use of the abstractive suffix -(VVl)VVl. Section (5) discusses how the metaphor materializes in another grammatical form, noun incorporation. Section (6) discusses how the semantic structure of the metaphor materializes in writing, and language broadly. Finally, section (7) provides a summary and conclusion.
2 Searching for Linguistic Metaphors

As explained in chapter 3, this study uses a mixed-methodology approach integrating corpus linguistics and discourse analysis. However, it is also essential to explain how a corpus researcher implements their methodology in terms of the specific searches performed on the corpora used. Different kinds of searches yield different results, and certain kinds of searches are necessary based on the type of corpora used and the research question. As noted in chapter 3, the searches were initially informed by a previous discourse analysis of the Cross Group texts at the site of Palenque that showed possibly unique examples of the metaphor RULERS ARE TREES. A transliteration of the Cross Group texts was provided by Martha Macri from The Maya Hieroglyphic Database. Thus, this study first ran automated searches in The Maya Hieroglyphic Database with the help of Martha Macri for examples with similar, or parallel, grammatical constructions where no to only a few elements of an example were different from the examples at Palenque. Since The Maya Hieroglyphic Database is still being developed for use on an online platform, only automated searches were done at this time. Manual searches are only possible for individual texts since the database does not generate random concordance lines. This study thus manually searched The Maya Codices Database, Version 5.0 (Vail and Hernández 2018) and the Primary Standard Sequence Database (Mora-Marín 2004b) for hieroglyphic texts and the colonial Yokot'an (Chontal) Paxbolon Maldonado Papers and the Spanish authored colonial Ch'olti' Morán Manuscript to provide more context for the results. Manual searches of these sources allowed me to examine the grammar of examples in their full context, helping elucidate what findings from automated searches of The Maya Hieroglyphic Database. Results of my manual and automated searches of the Primary Standard Sequence Database are discussed in chapter 6 in full.
The initial searches helped establish that the examples at Palenque were rare, and the earliest of their kind, because they had a different grammatical shape and thus exhibited a novel linguistic metaphor of the conceptual metaphor **RULERS ARE TREES**. Some discussion of the conceptual structure of the metaphor and how to label the semantic domains involved in a metaphor is provided in this chapter, and a fuller discussion of this topic in the next chapter, chapter 5. Commonly, metaphor researchers analyze whether a given example exhibits a distinct conceptual metaphor from another example or a conceptual metaphor with a wider or narrower scope. Usually, this is accomplished by utilizing target domain vocabulary in corpus searches. However, source domain searches are necessary when source domain vocabulary is lexically divorced, or not adjacent to, target domain vocabulary (Lederer 2016). Searching for vocabulary from a specific semantic domain, whether the target or source domain, allows a researcher to get a bigger picture of how a source domain is used or how a target domain is structured in conceptual metaphors. These kinds of searches show *which* semantic elements of a domain are being used in a conceptual metaphor, and *which* semantic domains are being related to each other in conceptual metaphors.

Here, it was not possible to search for vocabulary strictly from the target domain of **RULERS**. Mayan hieroglyphic texts often omit mention of the subject, often a ruler, altogether, to add suspense about who a text is referencing (Josserand 1991). Political elites are also referenced in numerous ways in lengthy epithets, making any single search term problematic. It would also be difficult to search for target domain vocabulary because many political titles are from the domain of **TREES** themselves. It is also beyond the scope of this project to manually examine more vocabulary, whether from the source or target domain. However, because the available Mayan hieroglyphic texts amount to a small, specialized corpus compared to those documenting
modern languages, available hieroglyphic dictionaries are reliable sources for how vocabulary from source and target domains may have been used. Additionally, there has been a plethora of studies on the context of use of much of this vocabulary. The next section thus reviews dictionary sources and this research to begin an examination of the conceptual structure of the RULERS ARE TREES metaphor.

3 Attested Vocabulary from the domain of PLANTS and RULERS

This section will discuss the relevant attested vocabulary from the semantic domains of TREES, PLANTS, RULERS, and other related domains to describe the possible semantic elements that may have been utilized in the RULERS ARE TREES conceptual metaphor. Section (3.1) reviews dictionary data for attested vocabulary from the domain of PLANTS, including TREES and other related domains. Section (3.2) reviews attested vocabulary from the domain of RULERS that also use vocabulary from the semantic domain of TREES and PLANTS, thus attesting the metaphor RULERS ARE TREES.

3.1 Attested Vocabulary from the domain of PLANTS

The vocabulary discussed in this section and the next comes from The New Catalog of Maya Hieroglyphs Volume 1: The Classic Period Inscriptions (Macri & Looper 2003), The New Catalog of Maya Hieroglyphs Volume 2: The Codical Texts (Macri & Vail 2009), Dictionary of Maya Hieroglyphs (Montgomery & Helmke 2007), and Introduction to Maya Hieroglyphs (Kettunen & Helmke 2020). The New Catalog of Maya Hieroglyphs Volume 1: The Classic Period Inscriptions (Macri & Looper 2003) and The New Catalog of Maya Hieroglyphs Volume 2: The Codical Texts (Macri & Vail 2009) are the result of systematic documentation of glyphic
variants. An *Introduction to Maya Hieroglyphs* (Kettunen & Helmke 2020) and the *Dictionary of Maya Hieroglyphs* (Montgomery & Helmke 2007) are useful for their documentation of common glyphic spellings and examples beyond individual graphemic readings. Additional sources are used when they are known to the author, to give alternative interpretations of a given glyph. Note, some of these interpretations will be argued for or against in the remainder of this study. All transcriptions of a given glyph are given in their pre-Ch'olan forms, regardless of their transcriptions in the sources used, to have consistency with the transcriptions in the rest of the study.

Vocabulary from the domain of PLANTS includes plant types, plant subtypes, and plant parts. Table (4.1) lists the attested vocabulary from the domain of PLANTS in the hieroglyphic corpus18:

<table>
<thead>
<tr>
<th>Glyphic Image (when available)</th>
<th>Glyph Code</th>
<th>Transliteration</th>
<th>Transcription</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Glyph Image" /></td>
<td>2G1 / T87</td>
<td>te, TE'</td>
<td><em>te / tee'</em></td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
<tr>
<td><img src="image2" alt="Glyph Image" /></td>
<td>T087hv</td>
<td>te, TE'</td>
<td><em>te / tee'</em></td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
<tr>
<td><img src="image3" alt="Glyph Image" /></td>
<td>YG2 / T513</td>
<td>te, TE'</td>
<td><em>te / tee'</em></td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
<tr>
<td><img src="image4" alt="Glyph Image" /></td>
<td>XGC / T580[646]</td>
<td>te, TE'</td>
<td><em>te / tee'</em></td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
</tbody>
</table>

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18 Glyph codes are not given when not provided by the original source.
<table>
<thead>
<tr>
<th>Glyphic Image (when available)</th>
<th>Glyph Code</th>
<th>Transliteration</th>
<th>Transcription</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="78x708" alt="Glyph Image" /></td>
<td>2G1 / T350</td>
<td>te, TE'</td>
<td>te / tee'</td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
<tr>
<td>-</td>
<td>ST4</td>
<td>te, TE'</td>
<td>te / tee'</td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
<tr>
<td>-</td>
<td>XGC</td>
<td>te, TE'</td>
<td>te / tee'</td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
<tr>
<td>-</td>
<td>YG1</td>
<td>te-, TE'</td>
<td>te / tee'</td>
<td>‘numeral classifier’ / ‘tree, wood, plant’</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>YAX-TE'</td>
<td>yaaxtee'</td>
<td>‘blue/green (ceiba) tree’</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>CHAK-TE'</td>
<td>chak tee'</td>
<td>‘red (tropical cedar) tree’</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>CHAK-ka-la-TE'</td>
<td>chakal tee'</td>
<td>‘reddish (chicozapote) tree?’</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>EK'-TE'</td>
<td>'ek' tee'</td>
<td>‘unidentified plant or tree’</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>K'AK'-TE'</td>
<td>k'ak tee'</td>
<td>‘unidentified plant or tree’</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>K'AN-TE'</td>
<td>k'an tee'</td>
<td>‘unidentified plant or tree, bench/seat made of wood’</td>
</tr>
<tr>
<td><img src="78x695" alt="Glyph Image" /></td>
<td>XQ2 / T646</td>
<td>NICH / NICHTE'</td>
<td>nich / nichtee'</td>
<td>‘flower (general)’ / ‘plumeria’</td>
</tr>
<tr>
<td><img src="78x681" alt="Glyph Image" /></td>
<td>2S7:XQ2:2G1 / T299:646:87</td>
<td>NICHTE'</td>
<td>nichtee'</td>
<td>‘flower (general)’ / ‘plumeria’</td>
</tr>
<tr>
<td>Glyphic Image (when available)</td>
<td>Glyph Code</td>
<td>Transliteration</td>
<td>Transcription</td>
<td>Translation</td>
</tr>
<tr>
<td>--------------------------------</td>
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<tr>
<td>-</td>
<td>3M8 / T147</td>
<td>NICH?</td>
<td>nich?</td>
<td>‘flower (general), jewel’</td>
</tr>
<tr>
<td>-</td>
<td>XE1 / T501</td>
<td>HA'/NAHB'</td>
<td>ha'/naHb'</td>
<td>‘water’ / ‘waterlily? sea/lake, plaza’</td>
</tr>
<tr>
<td>-</td>
<td>1G1:XGE / T23:585a</td>
<td>na-b'i</td>
<td>naHb'</td>
<td>‘sea/lake, plaza, waterlily?’</td>
</tr>
<tr>
<td>-</td>
<td>XD6 / T625</td>
<td>NAHB'</td>
<td>naHb'</td>
<td>‘sea/lake, plaza, waterlily?’</td>
</tr>
<tr>
<td>-</td>
<td>SS5 / T132</td>
<td>'UXLAJUN, HA'?, NAHB'?</td>
<td>'uuxlajuun / ha'?, naHb'?</td>
<td>‘thirteen’ / ‘water’? / ‘sea/lake, plaza, waterlily?’</td>
</tr>
<tr>
<td>-</td>
<td>2S3 / T244</td>
<td>NAHB'</td>
<td>naHb'</td>
<td>‘sea/lake, plaza, waterlily?; stain?, paint?’</td>
</tr>
<tr>
<td>-</td>
<td>SCA</td>
<td>NAHB'</td>
<td>naHb'</td>
<td>‘sea/lake, plaza, waterlily?’</td>
</tr>
<tr>
<td>-</td>
<td>XG7</td>
<td>NAHB'</td>
<td>naHb'</td>
<td>‘sea/lake, plaza, waterlily?’</td>
</tr>
<tr>
<td>-</td>
<td>XQ8</td>
<td>NAHB'</td>
<td>naHb'</td>
<td>‘sea/lake, plaza, waterlily?’</td>
</tr>
<tr>
<td>-</td>
<td>XH7 / T854</td>
<td>PUJ</td>
<td>puj</td>
<td>‘cattail, bulrushes,</td>
</tr>
</tbody>
</table>

19 The notation H will be used in transcriptions for instances where there is not enough evidence to reconstruct [h] versus [j].
<table>
<thead>
<tr>
<th>Glyphic Image (when available)</th>
<th>Glyph Code</th>
<th>Transliteration</th>
<th>Transcription</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33C / T214</td>
<td>JAL</td>
<td>jal</td>
<td>‘reed, grass’</td>
</tr>
<tr>
<td></td>
<td>ZSE / T696</td>
<td>aj / 'AJ</td>
<td>'aj</td>
<td>‘masculine agentive, reed’</td>
</tr>
<tr>
<td></td>
<td>2S1 / T86</td>
<td>NAL</td>
<td>nal</td>
<td>‘maize, village, town’</td>
</tr>
<tr>
<td></td>
<td>PE8 / T1006a</td>
<td>WAXAK / NAL</td>
<td>waxak / nal</td>
<td>‘eight’ / ‘maize, town, village’</td>
</tr>
<tr>
<td></td>
<td>1S1 / T117</td>
<td>wi / WI'/ W'TIL</td>
<td>-Vw / wii'/ wi'il /</td>
<td>‘verbal suffix’ / ‘root’ / ‘last, lacking’</td>
</tr>
<tr>
<td></td>
<td>32H</td>
<td>JINAJ</td>
<td>jiinaaj</td>
<td>‘seed, seed of maize’</td>
</tr>
</tbody>
</table>

Table 4.1. Vocabulary for plant types, plant subtypes, and plant parts, and their glyphic spellings in the hieroglyphic corpus (Images from Montgomery & Helmke (2007); Examples from Macri and Looper (2003), Macri and Vail (2009), Montgomery & Helmke (2007); Kettunen and Helmke (2020); Boot (2006); Mora-Marín (2010a)).

Table (4.1) shows that very few terms for plant types, plant subtypes, and their parts are used in the hieroglyphic corpus. Attested terms for plant types include te/tee’ ‘num. classifier / tree, wood, plant’, nich/nichtee’ ‘flower (general) / plumeria’, puj ‘cattail, bulrushes, proper name of Tollan’, nal ‘maize, village, town’, and possibly naHb ‘waterlily?, water, sea/lake, plaza’. A few subtypes of plants are also referenced, mostly trees, including both identified and unidentified varieties. Identified types of trees include yaaxtee’ ‘blue/green (ceiba) tree’, chak tee’ ‘red (tropical cedar) tree’, chakal tee’ ‘reddish (chicozapote) tree?, ’ek’ tee’ ‘unidentified plant or
tree’, *k'ak tee’* ‘unidentified plant or tree’, and *k'an tee’* ‘unidentified plant or tree, bench/seat made of wood’. Finally, only two plant parts are referenced, *wii’* ‘root’ and *jiinaaj’* ‘seed, seed of maize’. Other terms for plant parts may include polysemous vocabulary that has semantic senses referring to both human body and plant parts, such as *k'ab’* ‘hand/arm, branch’ and *(h)ut’* ‘eye, face, fruit’, but it is not clear that they are used to reference both human body parts and plants in the hieroglyphic corpus. These terms are discussed in full in the next chapter, chapter five.

Vocabulary from the domain of **PLANTS** may also include terms referencing food production, though this could be delimited as the separate or subdomain of **AGRICULTURE**. This includes vocabulary referring to agricultural actions, plant lifecycles, plant foods and products, and attributes of food. Table (4.2) lists the attested vocabulary in the hieroglyphic corpus from the domain of **AGRICULTURE**:20:

<table>
<thead>
<tr>
<th>Glyphic Image (when available)</th>
<th>Glyph Code</th>
<th>Transliteration</th>
<th>Transcription</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>APB / T758a</td>
<td>ch'o-[ko]</td>
<td><em>ch'ok / ch'ohok</em></td>
<td>‘unripe, youth, heir’ / ‘rat/mouse’21</td>
</tr>
<tr>
<td>[Image]</td>
<td>AP9:1BA / T757v:110</td>
<td>ch'o-ko</td>
<td><em>ch'ok / ch'ohok</em></td>
<td>‘unripe, youth, heir’ / ‘rat/mouse’</td>
</tr>
<tr>
<td>[Image]</td>
<td>XQ1 / T281</td>
<td>K'AN</td>
<td><em>k'an</em></td>
<td>‘yellow, ripe’</td>
</tr>
<tr>
<td>[Image]</td>
<td>XD1.ZZA / T586.669</td>
<td>pa-k'a</td>
<td><em>pak’</em></td>
<td>‘to set/place, to plant’</td>
</tr>
</tbody>
</table>

20 Glyph codes are not given when not provided by the original source.
21 This study argues that *ch'ok* should also be translated as ‘heir’ as it is used in hieroglyphic examples.
<table>
<thead>
<tr>
<th>Glyphic Image (when available)</th>
<th>Glyph Code</th>
<th>Transliteration</th>
<th>Transcription</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3M7:XD1 / T68:586</td>
<td>tz'a-pa</td>
<td>tz'ap</td>
<td>‘to plant, to insert, to hoist’</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>pa-ta-ha</td>
<td>patah</td>
<td>‘guayaba’</td>
</tr>
<tr>
<td></td>
<td>YSB:AMB / T21:534</td>
<td>b'u-la</td>
<td>bu'ul</td>
<td>‘bean’</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>cha-b'i</td>
<td>chaab</td>
<td>‘bee, beehives, honey’</td>
</tr>
<tr>
<td></td>
<td>YS1 / T526</td>
<td>CHAB'</td>
<td>chaab'</td>
<td>‘bee, beehives, honey’</td>
</tr>
<tr>
<td></td>
<td>PM1 / T1004</td>
<td>sa / SA'</td>
<td>sa'</td>
<td>‘atole, maize gruel’</td>
</tr>
<tr>
<td></td>
<td>HE5 / T278</td>
<td>sa / SA'</td>
<td>sa'</td>
<td>‘atole, maize gruel’</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>sa / SA'</td>
<td>sa'</td>
<td>‘atole, maize gruel’</td>
</tr>
<tr>
<td></td>
<td>HE6.ZUG / T738v.568</td>
<td>u-lu</td>
<td>'uul</td>
<td>‘atole, maize gruel’</td>
</tr>
<tr>
<td></td>
<td>XH4 / T506</td>
<td>WAJ / 'OL</td>
<td>waaj / 'oHl</td>
<td>‘tamale, food’ / ‘heart’</td>
</tr>
<tr>
<td></td>
<td>XH4:2S2.33F / T506:130.136</td>
<td>wa-WA-ji</td>
<td>waaj</td>
<td>‘tamale, food’</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>ALA / T652</td>
<td>HUJ WAJ</td>
<td>huuj waaj</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>ALB</td>
<td>'AHK WAJ</td>
<td>'ahk waaj</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>BMB</td>
<td>KUTZ WAJ</td>
<td>kuutz waaj</td>
</tr>
<tr>
<td></td>
<td>AA1.136 / T738.130</td>
<td>ka-wa</td>
<td>kakaw</td>
<td>‘cacao’</td>
</tr>
<tr>
<td>Glyphic Image (when available)</td>
<td>Glyph Code</td>
<td>Transliteration</td>
<td>Transcription</td>
<td>Translation</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------</td>
<td>-----------------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td><img src="image1" alt="Glyph Image" /></td>
<td>AA1:136 / T738:130</td>
<td>ka-wa</td>
<td><em>kakaw</em></td>
<td>‘cacao’</td>
</tr>
<tr>
<td><img src="image2" alt="Glyph Image" /></td>
<td>k'i-WI'</td>
<td>*k'iwi’</td>
<td>‘achiote’</td>
<td></td>
</tr>
<tr>
<td><img src="image3" alt="Glyph Image" /></td>
<td>chi-hi</td>
<td><em>chih</em></td>
<td>‘fermented beverage made from agave’</td>
<td></td>
</tr>
<tr>
<td><img src="image4" alt="Glyph Image" /></td>
<td>ka-ka-wa-la</td>
<td><em>kakawal / kakawaal</em></td>
<td>‘cacao-like?’ / ‘cacao grove/orchard’</td>
<td></td>
</tr>
<tr>
<td><img src="image5" alt="Glyph Image" /></td>
<td>32D:YM2.AMB / T61:178v</td>
<td>yu-ta-la</td>
<td><em>yutal</em></td>
<td>‘his/her/its fruit/fruit?/seeds?/contents?’</td>
</tr>
<tr>
<td><img src="image6" alt="Glyph Image" /></td>
<td>32K.XH5 / T60.507</td>
<td>tzi-hi</td>
<td><em>tzih</em></td>
<td>‘unripe, raw, uncooked’</td>
</tr>
<tr>
<td><img src="image7" alt="Glyph Image" /></td>
<td>2G1:YG2.1SC / T87:188</td>
<td>te'-TE'-le</td>
<td><em>tee'eel</em></td>
<td>‘tree-fresh?, of the forest?, wild?, forest/grove/orchard, lineage?’</td>
</tr>
</tbody>
</table>

Table 4.2. Vocabulary for food and agriculture and glyphic spellings in the hieroglyphic corpus (Images from Montgomery & Helmke (2007); Examples from Macri and Looper (2003), Macri and Vail (2009), Montgomery & Helmke (2007); Kettunen and Helmke (2020)).

Table (4.2) shows that most of the attested vocabulary from the domain of *AGRICULTURE* references plant foodstuff and that there are very few references to agricultural practices or plant

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22 That -WI suffixes are often abstractive suffixes on terms for plants that derive a meaning of ‘location of X, or collection of X’, is argued throughout this study. Hence, *kakawaal* could be referencing ‘cacao grove/orchard’.

23 Interpretations of this glyphic collocation are discussed in more depth in chapter 6.

24 This study argues in depth that *tee'eel* should be interpreted as ‘orchard’ in most hieroglyphic examples and was metaphorically extended to mean ‘lineage’ in a few cases.
lifecycles. Terms that reference plant lifecycles include ch’ok ‘unripe, youth, heir’ and k’an ‘yellow, ripe’. Terms that reference agricultural practices include pak’ ‘to set/place, to plant’ and tz’ap ‘to plant, to insert, to hoist’. Terms that reference plant foodstuffs include many terms for maize products such as sa’/tuul ‘atole, maize gruel’, waaj ‘tamale, food’ and of many specific kinds such as huuj waaj ‘iguana tamale’. Other terms for plant foodstuffs include bu’ul ‘bean’, patah ‘guayaba’, chaab’ ‘bee, beehives, honey’, kakaw ‘cacao’, and k’iwi’ ‘achiote’.

Several terms have been proposed as referencing attributes of foods, including kakawal ‘cacao-like?, cacao grove/orchard’, yutal ‘his/her/its fruited?, his/her/its seeds?, contents?’, tzih ‘unripe, raw, uncooked’, and tee’eel ‘tree-fresh?, of the forest?, wild?, forest/grove/orchard, lineage’. The meanings of the last two terms are unclear, while the exact meaning of tee’eel ‘tree-fresh?, of the forest? wild?, forest/grove/orchard, lineage’ is the subject of this and the next two chapters, where this study argues for a different interpretation altogether. Specifically, this study argues in-depth that tee’eel should be interpreted as ‘orchard’ in most hieroglyphic examples and was metaphorically extended to mean ‘lineage’ in a few cases and is translated as such throughout this study.

Though the language of the authors of these texts certainly had more vocabulary from the domain of plants, the hieroglyphic texts clearly emphasize trees, and plant foodstuff, especially maize. This section thus showed what terms were important to the writers of the hieroglyphic texts and what terms were available at all for metaphorical usage, though it is beyond the scope of this study to examine all of these terms for metaphorical usages. Accordingly, the metaphorical uses examined in this chapter use terms referencing trees, and plant foodstuff. Further, the vocabulary from the domain of plants attested in the hieroglyphic corpus contained two verbs, four adjectives, and thirty-one nouns, making nominal vocabulary the most available
for metaphorical uses. Future research on the actual usages of metaphor with this vocabulary and from other domains in Mayan hieroglyphic texts will show if part of speech patterns with the construction of metaphors but is beyond the scope of this study. Research on metaphor and grammar suggests, that at least in some contexts, metaphors predominantly use some parts of speech over others, with nouns being the rarest kind and verbs predominating (Cameron 2003). Thus, this study focuses on the relationship between metaphor and grammar with examples of actual metaphor usages in their socio-historic and discursive contexts.

3.2 Attested Vocabulary from the domain of RULERS

Use of plant symbolism to describe and depict Mayan political elites, their affairs, and more broadly genealogical relations, has long been noted by Mayan scholars (e.g. Christensen 2011; Freidel & Reilly 2010; Houston & Cummins 1998; Knowlton & Vail 2010; Lucero 2002; Martin 2006; McAnany 1995; McDonald & Stross 2012; McNeil 2006; Mondloch & Carmack 2018; Reents-Budet 2006; Stross 2009; Stuart 2006a, 2006b, 1996; Taube 2010, 2004, 1985; Tedlock 1996). This section thus discusses Mayan titles for political elites that often incorporate vocabulary from the semantic domain of PLANTS broadly, and the semantic domain of TREES more narrowly. The use of one domain, here PLANTS and TREES, to depict or describe another, here RULERS, indicates this vocabulary at least originated from a conceptual metaphor. Given the surrounding visual depictions of the metaphor RULER ARE TREES that accompanied uses in hieroglyphic writing, this vocabulary may have still been processed metaphorically in many cases or reinterpreted metaphorically, as elaborated in the next two chapters.

A very common general title for political elites is ‘aajaaw ‘ruler’. Etymologically, the meaning of ‘aajaaw is not agreed upon. McKinney (2011) reviews etymological analyses of
'aajaaw' and argues for an analysis where 'aajaaw' is derived from 'aj-'aw 'he of the seed' with 'aj-' being the agentive prefix and 'aw' meaning 'seed' in Tzeltal (Macri & Looper 2003; Stross 1994). Another account argues that 'aajaaw' should actually be read as 'aj-pop 'he of the mat', again where 'aj-' is the agentive prefix and pop means 'mat' (Lounsbury 1973; McKinney 2011). The last analysis contends that 'aajaaw' was borrowed from the proto-Mixean ajw/awa 'mouth speaker’ or ‘orator’ (Fields 1989; Stross 1994; McKinney 2011). However, Mora-Marín (2020 personal communication) has cautioned that the agentive reading is not phonetically reconstructable. For example, Kaufman and Justeson (2021 personal communication) noted that:

(1) The term must be reconstructed with two long vowels: 'aajaaw'. However, (a) the vowel of 'aj-' is short, and (b) the vowel of the root ‘to sow seeds’, *'aw, is also short, though an alternative hypothesis for this word has been proposed based on a Western Mayan root *'aaw ‘to shout’.

(2) All reconstructable Mayan roots begin with a consonant; so, there is not and could never be a root aw or aaw; the root for *(a)j + a root. The forms of ‘shout-er’ and ‘sower’ would be *'aj'aaw and *'aj'aw – neither of which would have long vowels in both syllables, and both of which would have the word-internal glottal stop.

Despite problems with the above readings, Mora-Marín (2009b), like McKinney (2011), demonstrates there is an iconographic association of glyphs for 'aajaaw' with plant iconography, specifically reeds or cattails. Both McKinney (2011) and Mora-Marín (2009b) broadly note that the iconographic association of plants with rulers was based on metaphors for Mayan rulership. McKinney (2011) argues this metaphoric association is specifically between maize and rulers, where rulers were ritually responsible for the survival of maize crops. Mora-Marín (2009b) notes the association of reeds and cattails with water, water’s association with the underworld, and rulers’ responsibility to communicate with the supernatural in the underworld to conjure rain for the sustaining crops. Table (4.3) shows the glyphic variants of 'aajaaw ‘ruler’:
<table>
<thead>
<tr>
<th>Glyphic Image (when available)</th>
<th>Glyph Code</th>
<th>Transliteration</th>
<th>Transcription</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL2.ZU1:2S2 / T229.683b:130</td>
<td>'a-ja-wa</td>
<td>'aajaaw</td>
<td>‘ruler’</td>
<td></td>
</tr>
<tr>
<td>BV1 / T747a</td>
<td>'AJAW</td>
<td>'aajaaw</td>
<td>‘ruler’</td>
<td></td>
</tr>
<tr>
<td>AM1 / T533</td>
<td>'AJAW</td>
<td>'aajaaw</td>
<td>‘ruler’</td>
<td></td>
</tr>
<tr>
<td>2M2:2M1 / T168:518</td>
<td>'AJAW</td>
<td>'aajaaw</td>
<td>‘ruler’</td>
<td></td>
</tr>
<tr>
<td>PT7 / T1000d</td>
<td>'AJAW</td>
<td>'aajaaw</td>
<td>‘ruler’</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3. Glyphic spellings of 'aajaaw in the hieroglyphic corpus (Images from Montgomery & Helmke (2007); Examples from Macri and Looper (2003), Macri and Vail (2009), Montgomery & Helmke (2007); Kettunen and Helmke (2020)).

Though the general title of 'aajaaw ‘ruler’ was not derived metaphorically, there are other metaphorically derived titles that utilize the term 'aajaaw ‘ruler’ and the source domain of TREES. The title 'aajaawtee‘tree ruler' combines 'aajaaw ‘ruler’ with the word tee‘tree', as shown in example (4.1):

---

25 Compound or phrasal terms will only be translated in the senses they are believed to attest, and not every sense attested for each word, in this study, for simplicity.

26 For translation of the term tee', only the semantic sense of ‘tree’, and not ‘plant, wood’, is used unless otherwise noted. This is for simplicity, since this the sense discussed throughout most of this study.
It is evident that example (4.1) was metaphorically derived because both vocabularies from the target domain RULERS and the source domain TREES are utilized, here in a compound form. The title thus exemplifies the metaphor RULERS ARE TREES. This title can be modified as well, as shown in example (4.2):

(4.2)

In example (4.2), the adjective sak ‘white’ modifies 'aajaawtee' ‘tree ruler’ but it is unclear what exactly it contributes to the meaning of the title.
A title for an elite warrior, *b'ah tee'* ‘head tree/wood/spear’, that also uses *tee*’ ‘tree, wood’, as shown in example (4.3):

(4.3)

<table>
<thead>
<tr>
<th>b'a-TE'</th>
<th>'head tree/spear'</th>
</tr>
</thead>
<tbody>
<tr>
<td>b'ah-tee'</td>
<td>head/first-tree/wood</td>
</tr>
</tbody>
</table>

(Image and transliteration from Montgomery & Helmke 2007).

Example (4.3) though, may specifically reference the material uses of trees as wood for making spears used in warfare. Kaufman & Norman (1984) reconstruct *b'o j te' as ‘wall, fence’ and *b'âj ~ b'o j as ‘to nail’. These meanings could relate to ‘spear’ as fences can also be made of wood and ‘nailing’ involves a similar action to ‘spearing’, by piercing an object. In such a case, *tee*’ ‘tree, wood’ would be used metonymically where one part of a domain stands in for another part of that same domain. Specifically, the metonymy would be INSTRUMENT FOR USER, where a spear made of wood is an instrument used in war by a soldier or warrior.

Example (4.4) shows the title *ch'ok* ‘unripe, youth, heir’ that does not utilize a term for a plant part, but a term for a life stage of a plant:
Kaufman and Norman (1984) reconstruct the semantic senses of *ch'ok* as ‘unripe (adj.), young child (n.)’ in proto-Ch'olan, and Ch'olan languages attest similar senses from these domains, shown in table (4.4):

<table>
<thead>
<tr>
<th>Ch'ol</th>
<th>Yokot'an (Chontal)</th>
<th>Ch'orti'</th>
<th>Colonial Ch'olti'</th>
<th>Colonial Ch'ol</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n.) newborn child</td>
<td>(n.) baby, child, son or daughter, boy, creature</td>
<td>(adj.) young, tender, unripe</td>
<td>(n.) youth, child&lt;sup&gt;27&lt;/sup&gt;</td>
<td>(n.) youth (adj.) young, small&lt;sup&gt;28&lt;/sup&gt;</td>
</tr>
<tr>
<td>(adj.) young, small, tender, unripe</td>
<td>(adj.) young, small, tender, unripe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The association of the domain of *plants* and the title *ch'ok* ‘unripe, youth, heir’ has also been noted by many scholars (e.g. Houston & Stuart 2001; Jackson 2013). These scholars have also

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<sup>27</sup> Colonial Ch'olti' does not attest any adjectival sense of *ch'ok*, including ‘unripe’ but this may be because the only extant document is a religious text and not native authored.

<sup>28</sup> Hopkins, Josserand, & Cruz Guzman (2011:58) note examples of the use of *ch'ok* in plant names, but not a specific sense of ‘unripe’.
presumed a metaphorical connection between the senses of *ch’ok*, which has often been translated as ‘sprout’. In this study, *ch’ok* will be translated more directly as ‘unripe, youth, heir’ based on attested senses in contemporary Ch’olan languages and hieroglyphic texts and reconstructions in Proto- Ch’olan. Both the author, Dinkel (2013), and Jackson (2013:119) discussed this term broadly in terms of Conceptual Metaphor Theory, though this study more fully elaborates metaphorical uses of *ch’ok* ‘unripe, youth, heir’ in this and the following chapters. The semantic senses of *ch’ok* ‘unripe, youth, heir’ were clearly derived metaphorically, with the sense of ‘unripe’ from the domain of PLANTS being extended to have a sense ‘heir’ from the domain of RULERS. The sense of ‘heir’ from the domain of RULERS is a specification of the sense of ‘youth’ from the domain of PEOPLE. The title *ch’ok* ‘unripe, youth, heir’ can also be modified by *b’ah* ‘head, first’ as shown in example (4.5):

(4.5)

<table>
<thead>
<tr>
<th>b’a-ch’o-ko</th>
</tr>
</thead>
<tbody>
<tr>
<td>b’ah ch’ok</td>
</tr>
<tr>
<td>head/first unripe/youth/heir</td>
</tr>
<tr>
<td>‘head unripe, youth’ / ‘head heir’</td>
</tr>
</tbody>
</table>

(Image and transliteration from Montgomery & Helmke 2007).

In example (4.5), *b’ah* ‘head, first’ perhaps indicates there was a ranking amongst those with the *ch’ok* ‘unripe, youth, heir’ title, with some being first in line to the throne above others. Jackson (2013:119) also notes that *ch’ok* ‘unripe, youth, heir’ can modify other titles including *ch’ok* ‘aajaaw ‘ruler youth, heir?’ and *ch’ok* sajal ‘sajal youth, heir?’. The title *ch’ok* aajaaw ‘ruler
youth, heir?’ seems to be an explicit statement of what those with the title *ch'ok* ‘unripe, youth, heir’ were typically heirs of, while *ch'ok sajal* ‘sajal youth, heir?’ may be a more unique usage.

Finally, example (4.6) shows a title for the founder of an entire political lineage, *wii’ ch'ok? tee' naah* ‘root unripe? tree house’:

(4.6)

<table>
<thead>
<tr>
<th>WI-CH’OK?-TE’-NAH</th>
</tr>
</thead>
<tbody>
<tr>
<td>wii’-ch'ok?-tee'-naah</td>
</tr>
<tr>
<td>root-unripe-tree-house</td>
</tr>
<tr>
<td>‘root unripe tree house’ / ‘lineage founder’</td>
</tr>
</tbody>
</table>

(Image and transliteration from Montgomery & Helmke 2007).

Example (4.6) *wii’ ch'ok? tee' naah* ‘root unripe? tree house’ was clearly derived metaphorically, using terms from the domains of PLANTS, TREES, and BUILDINGS to reference the domain of RULERS, specifically a lineage founder. Because the term seems to utilize more than one source domain, it may be metaphorical composed and consist of two metaphors, RULERS ARE TREES and POLITICAL LINEAGES ARE BUILDINGS (Fauconnier & Turner 2002). Again, *tee’* ‘tree’ has semantic senses of a kind of plant and of a kind of building material. The phrase *wii’ ch'ok? tee' naah* ‘root unripe? tree house’ may thus be expressing that the lineage founder is the metaphorical base or structural support of the lineage, which roots provide for plants, like trees, and wood does for buildings. Note, previous readings did not include *ch'ok* ‘unripe, youth, heir’ as part of the title. If the *ch'ok* ‘unripe, youth, heir’ reading is correct, the title may express the metaphorical reasoning, or entailment, that the lineage founder is also the originator of the *process* of growth of the lineage, just like an unripe plant eventually matures to provide offspring or fruit. Further,
temples, such as at the Temple of the Foliated Cross at Palenque, could be labeled as *tee’aah k’anal* ‘yellow tree house’, but this may be a direct reference to the maize plant depicted here. This makes sense given that such monumental architecture provided lengthy genealogical accounts and trees themselves are depicted with writing in some of the codices, as discussed in chapter 2. There is thus a clear association between political lineages, monumental structures, and trees.

### 4 The Grammatical Shape of Metaphor: The Abstractive –*(VVl)*VVl Suffix

This section demonstrates that the abstractive suffix –*(VVl)*VVl is used with the *RULERS ARE TREES* metaphor because the suffix’s grammatical functions elaborate the meaning of the metaphor. Specifically, it examines examples that use the abstractive suffix –*(VVl)*VVl with *tee’* ‘tree’ and *ch’ok* ‘unripe, youth, heir’. Section (4.1) presents examples of the *RULERS ARE TREES* metaphor that uses the abstractive suffix –*(VVl)*VVl and gives frequencies of these usages. Section (4.2) presents other evidence from hieroglyphic, colonial, and contemporary sources on Mayan languages that support this study’s analysis.

#### 4.1 The Abstractive Suffix –*(VVl)*VVl and *RULERS ARE TREES* Metaphor

As noted in section (2), corpus searches were performed based on a previous discourse analysis of the Cross Group Texts at Palenque that revealed a rare example of the metaphor *RULERS ARE TREES*. Specifically, this study searched for examples of *tee’* ‘tree’ and *ch’ok* ‘unripe, youth, heir’ that used the abstractive suffix –*(VVl)*VVl. The abstractive suffix –*(VVl)*VVl is a derivational suffix that derives abstract nouns from nouns and adjectives. Examples of *tee’*
‘tree’ and ch’ok ‘unripe, youth, heir’ that use the abstractive suffix –(VVl)VVl are rare and only occur at a few sites, apart from the high frequency of tee ‘tree’ that uses the abstractive suffix –(VVl)VVl on vases with the Primary Standard Sequence (PSS), discussed in chapter 6. Given the small amount of these examples, an examination of all these examples in context was possible.

The absolute frequencies of these examples are given in table (4.5):

<table>
<thead>
<tr>
<th>Example of Metaphorical use of the Abstractive Suffix –(VVl)VVl</th>
<th>Absolute Frequency</th>
<th>Media Type</th>
<th>Provenance</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>tee’eel ‘orchard, lineage’</td>
<td>6</td>
<td>Carved</td>
<td>Palenque (4), Laxtunich (1), Yaxchilan (1)</td>
<td>Late Classic (6)</td>
</tr>
<tr>
<td>tee’eel ‘orchard, lineage’ (likely)</td>
<td>3</td>
<td>Carved</td>
<td>Palenque (3)</td>
<td>Late Classic (3)</td>
</tr>
<tr>
<td>ch’okleel ‘heirship’ (possible)</td>
<td>1</td>
<td>Carved</td>
<td>Palenque (1)</td>
<td>Late Classic (1)</td>
</tr>
<tr>
<td>Totals</td>
<td>9</td>
<td>Carved</td>
<td>Palenque (8), Laxtunich (1), Yaxchilan (1)</td>
<td>Late Classic (10)</td>
</tr>
</tbody>
</table>

Table 4.5. Examples of the metaphorical use of the abstractive suffix, their absolute frequencies, and their media type, provenance, and time period, based on data from the Maya Hieroglyphic Database.

Table (4.5) shows there are only ten instances of tee ‘tree’ and ch’ok ‘unripe, youth, heir’ that use the abstractive suffix –(VVl)VVl with a metaphorical meaning, with four only being likely or possible. All of these examples occur on carved monumental architecture from the Late Classic, and only from sites of Palenque, Laxtunich, and Yaxchilan. However, instances from Palenque attest the earliest dates in the Late Classic occurring at 692 CE and 720 CE. The

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29 In table (4.5), ‘likely’ references cases that attest <OCH-TE> with no attestation of <le>. Other examples with <OCH-TE> also attest <le> and demonstrate that cases without <le> may be under-spellings. ‘Possibly’ refers to cases where it is not clear if active metaphorical processing was occurring, or if an example simple attests semantic senses that were derived metaphorically historically. Such examples are explained at length in this chapter.
instance from Yaxchilan occurs in 726 CE, and the instance from Laxtunich in 783 CE. There are also three other instances from Tikal that attest a spelling of <ti-KAL-TE'-le>, but it is unclear if the <le> syllabogram is modifying <TE'> and spelling the abstractive suffix –(VVl)VVl or <KAL> as a phonetic complement (Macri 2020 personal communication). These instances also occur after those at Palenque in 736 CE, 771 CE, and 790 CE. There are ninety other instances of tee’ ‘tree’ that use the abstractive suffix –(VVl)VVl, but these are used on vases with the Primary Standard Sequence (PSS) and are not clearly being used metaphorically or only beginning to shift in meaning, as is the subject of chapter 6. There are no other examples of ch'ok ‘unripe, youth, heir’ that use the abstractive suffix –(VVl)VVl apart from that at Palenque. There are also no examples of tee’ ‘tree’ or ch’ok ‘unripe, youth, heir’ that use the abstractive suffix –(VVl)VVl in the codices.

This study interprets tee'eel as ‘orchard, lineage’ in the examples presented here, counter to previous interpretations of tee'eel as ‘tree-fresh? of the forest? wild?’, which is fully explained in section (4.2). To note, Schele and Mathews (1999:120-122) described the depiction of political ancestors as an orchard in pictorial images on monumental architecture. Greene Robertson (1991: figures 10, 96, 154) also noted the examples from Palenque discussed here with tee'eel ‘orchard, lineage’ as referring to political accession. Similarly, Tedlock (2010:59-96) has noted the symbolic association of trees and accession. This study expands these interpretations through a metaphor analysis here and in the following sections.

Example (4.7) shows a metaphorical use of tee’ ‘tree’ with the abstractive suffix –(VVl)VVl from the Cross Group texts at Palenque. Example (4.7) is from a lengthy epithet in which ruler K'inich Kan Bahlam ‘Sun-eyed Snake Jaguar’ is given a new designation as heir to the throne of Palenque:
Example (4.7) shows the ruler’s new political position being described through vocabulary from the semantic domain of TREES with the word tee'eel ‘orchard, lineage’ formed by the root tee’ ‘tree’ and the abstractive suffix -eel, and the word ch'ok ‘unripe, youth, heir’. Example (4.7) thus shows a rare linguistic example of the RULERS ARE TREES metaphor. The transcription and translation of <ch'o-?> as ch'ok ‘unripe, youth, heir’ is secure given these texts are about heir initiation rituals and other parts of the text fully spell out the heir designee’s title as <ch'o-ko>.

Six examples from the Cross Group texts at Palenque show a similar use of the abstractive suffix –(VVI)VVI with tee’ ‘tree’ except they occur with the verb oo’och ‘to enter’. An example of this is seen in example (4.8):
Example (4.8) uses some of the same vocabulary from example (4.7), and thus is also an example of the RULERS ARE TREES metaphor. Example (4.8) also shows that *ch'ok* ‘unripe, youth, heir’ should be the transcription and translation of *<ch'o>-?* in example (4.7) with a clear spelling of *<ch'o-ko>*. Other grammatical aspects of this example and its metaphorical interpretation will be fully explained in section (5).

Example (4.9) comes from Laxtunich Panel 1 and shows a different use of *tee'* ‘tree’ with the abstractive suffix *(VVl)VVl*:

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The transliteration of example (4.8) by *The Maya Hieroglyphic Database* is in line with a drawing of the Temple of the Foliated Cross in Tedlock (2010:87), based on a drawing by Annie Hunter. This drawing, as is explained for example (4.20) below, shows a conflation of T765/AP5 with a logograph for TE ‘tree’ through the use of the ‘tree’ classifier that consists of a line and two semi-circles, discussed in chapter 2. This semantic classifier is placed at the top of the jaw of T765/AP5. Additionally, the bottom rightmost glyph of the first glyph block clearly depicts the *<le>* T188 syllabogram.
Example (4.9) is similar to example (4.7) in that *jee'eel* ‘orchard, lineage’ is attributed to a political elite in an epithet or name phrase. In (4.9) though, the domain of **BUILDINGS** is referenced in addition to the domain of **TREES**. Though the exact meaning of this example is uncertain, it may be similar to that of example (4.6) for *wii’ ch’ok?* *jee’naah* ‘root unripe/youth/heir? tree house’. It was noted that example (4.6) refers to lineage founders and may evidence metaphorical composing that includes the metaphor **POLITICAL LINEAGES ARE BUILDINGS** in addition to **RULERS ARE TREES**.

Example (4.10) shows the example from lintel 25 from Yaxchilan that also uses *tee’* ‘tree, wood, plant’ with the abstractive suffix –(*VVl)*VVI:
Example (4.10) is similar to examples (4.7) and (4.9) in that tee’eel ‘orchard, lineage’ is again attributed to a political elite in an epithet or name phrase. Example (4.10) is also similar to (4.7) and shows a use of the same glyph, T765/AP5, but with a different transliteration, transcription, and translation of < 'OK> ’ook ‘foot/leg, base’. It demonstrates use of the third person possessive pronoun uy= and thus indicates the following word is a noun. The difference for this interpretation will be fully explained in section (5.2). Thus, example (4.10) is translated as yook tee’eel ‘the foot/leg/base of the orchard/lineage’. There is also reference to the lineage founder title wii’ ch’ok? tee’ naah ‘root unripe? tree house’ in the same text, perhaps making the association of the meanings of tee’eel ‘orchard, lineage’ more explicit than in example (4.9).

Again, this may utilize metaphorical composing that includes the metaphor POLITICAL LINEAGES ARE BUILDINGS in addition to RULERS ARE TREES. The use of ’ook ‘foot/leg, base’ would

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31 There is variation of use of the prevocalic third person ergative markers y- and uy-, with the use of y- being more frequent overall but, use of uy- increasing over time (Mora-Marin with Wiesen 2019).
emphasize the structural support that a lineage founder provides for the rest of the lineage which is similar to the use of *wii* ‘root’.

Finally, example (4.11) attests the use of the abstractive suffix \( (VVI)_{VI} \) of *ch'ok* ‘unripe, youth, heir’ from the Palace Tablet at Palenque:

(4.11)

```
<table>
<thead>
<tr>
<th>CHUM-[mu]-ni</th>
<th>ta-hi-b'a</th>
<th>ch'o-ko-le-le</th>
<th>3-CH'AK-KAB'-na</th>
</tr>
</thead>
<tbody>
<tr>
<td>chum-wan-Ø</td>
<td>ta b'ah</td>
<td>ch'ok-leel</td>
<td>ux ch'akan? Kab'</td>
</tr>
<tr>
<td>to.sit-POS-3SG.ABS</td>
<td>PREP</td>
<td>unripe/youth/heir-ABSTR</td>
<td>Three Ch'akan Kab'</td>
</tr>
</tbody>
</table>

‘He was seated in heirship, Three Ch’akan Kab’’ / ‘He became an heir’ Three Ch’akan Kab’’
```

(Palace Tablet, Palace House A-D, glyph blocks K12-J13, Palenque; drawing by Linda Schele © David Schele (2000:SD-121); photo courtesy of Ancient Americas at LACMA (ancientamericas.org); cropped by author; transliteration courtesy of The Maya Hieroglyphic Database Project).

Example (4.11) may be being used metaphorically but it is not clear whether or not the meaning of *ch'ok* as ‘youth, heir’ has become lexicalized, and thus no longer connected to its semantic sense of ‘unripe’. As discussed in section (3), *ch'ok* ‘unripe, youth, heir’ was clearly derived metaphorically, extending its meaning from the domain of PLANTS to RULERS. Further, this derivation resulted in a change of part of speech, from an adjective to a noun, which is not uncommon with metaphorically based polysemy (Deignan 2005). This issue is fully discussed below, in section (4.2).
4.2 Justifying the Abstractive Suffix –(VVl)VVl Interpretation

Previous interpretations of tee’ ‘tree’ with a -VVl suffix on vases with the PSS have argued the -VVl suffix is one that derives an adjective or a noun with a modifying sense. The structure of the PSS and a detailed account of the uses of tee'eel ‘orchard’\(^{32}\) in the PSS will be discussed more fully in chapter 6. For the purposes of this chapter, it should be noted that tee'eel has been argued to have a sense of ‘wild, tree-fresh, of the forest’, describing the foodstuffs the vases were presumed to have held (Stuart 2006b)\(^{33}\). Example (4.12) is an example of the PSS that uses tee'eel ‘orchard’:

(4.12)

![Image](https://example.com/image.png)

<table>
<thead>
<tr>
<th>yu-k'i-b'i</th>
<th>ta-NAL/IXIM</th>
<th>TE'-le</th>
<th>ka-wa</th>
<th>CHAK</th>
</tr>
</thead>
<tbody>
<tr>
<td>y-uk'-ib'</td>
<td>ta nal/ixiim</td>
<td>tee'-eel</td>
<td>kakaw</td>
<td>chak</td>
</tr>
<tr>
<td>3SG.ERG-to.drink-INST</td>
<td>PREP maize</td>
<td>tree-ABSTR</td>
<td>cacao</td>
<td>red/great</td>
</tr>
<tr>
<td>ch'o-k'o</td>
<td>ke-KELEM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ch'ok</td>
<td>keleem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unripe/youth/heir</td>
<td>strong.young.man</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

‘It is his cup for maize, orchard cacao, great, great unripe, youth.’ / ‘It is his cup for maize, orchard cacao, great heir, strong young man.’

(Photo by Kerr (n.d.-b: K4991); digital image courtesy of Justin Kerr; cropped by author; transliteration courtesy of Mora-Marín (2004b).

In (4.12), previous interpretations of tee'eel as ‘wild, tree-fresh, of the forest’ would contend that tee'eel ‘wild, tree-fresh, of the forest’ modifies kakaw ‘cacao’ to have a meaning of ‘wild or of the forest cacao’ (Stuart 2006b). However, the interpretation of the -VVl suffix on tee’ ‘tree’ as

\(^{32}\) The term tee'eel will only be translated as ‘orchard’ in reference to its use in the PSS, since it is unclear if it had its metaphorically derived sense of ‘lineage’ in this context. This point is elaborated on for the remainder of this study.

\(^{33}\) As noted in chapter 2, and will be further discussed in chapter 6, there is no evidence in the form of useware or chemical residue that demonstrates certain kinds of vessels with the PSS were directly used for the consumption of foodstuffs (Loughmiller-Cardinal 2019).
simply deriving an adjective or a noun with a modifying sense fails to fully interpret the meanings of the examples from monumental architecture just presented in section (4.1). This section will demonstrate that the \(-VVI\) suffix is the abstractive suffix \(-(VVl)VVI\) in examples on monumental architecture and that it derives a meaning of ‘orchard’ that was extended metaphorically to mean ‘lineage’.

Assuming that the suffix on tee’eel ‘orchard, lineage’ derives an adjective or a noun with a modifying sense is problematic because there are several kinds of suffixes in contemporary Ch’olan languages with the shape of a vowel followed by a lateral liquid consonant [l], \(-Vl\) (Hull 2005; Kaufman & Norman 1984; Knowles 1984; Montgomery-Anderson 2014; Vázquez Álvarez 2011). To note, the notation \(-Vl\) and \(-(Vl)Vl\) will be used when referring to colonial and contemporary examples in Ch’olan languages, since vowel length is not preserved. Additionally, in Ch’orti’ there is a correspondence of [l:r] from sound change, so these suffixes would take the shape of \(-Vr\) and will be notated as such in this study. First, \(-Vl\) suffixes in these languages have various grammatical functions that can be either inflectional or derivational. As inflectional suffixes, they can mark intransitive verbs in incompletive temporal aspect, certain classes of possessed nouns, and the stative of positional roots (Hull 2005; Kaufman & Norman 1984; Knowles 1984; Montgomery-Anderson 2014; Vázquez Álvarez 2011). The abstractive suffix \(-(VVI)VVI\), as noted above, provides a derivational function that derives adjectives or abstract nouns (Kaufman & Norman 1984; Knowles 1984; Montgomery-Anderson 2014; Vázquez Álvarez 2011; Hull 2005). Additionally, in Yokot'an (Chontal), adjectives can be derived from transitive verbs (Montgomery-Anderson 2014). The hieroglyphic corpus attests many of these functions and may also attest cases where adjectives or modifying nouns can be derived from nouns (Macri 1997; Stuart & Law 2017).
Work giving a complete historical reconstruction of the vowels of these near homophonic suffixes that might be able to distinguish these suffixes’ functions in ambiguous cases is ongoing (Mora-Marín 2021). Additionally, what has been reconstructed shows that many of these vowels are the same across different \(-Vl/-VVl\) suffixes (Mora-Marín 2021). Mora-Marín with Wiesen (2019) and Macri (1997) have shown that in hieroglyphic texts, the abstractive suffix can take the shape of \(-aal, -iil, \text{ and } -(VVl)eel\). Mora-Marín with Wiesen (2019) argued that the \(-(VVl)eel\) form is innovative and may have originally combined two \(-VVl\) suffixes. Examples with the abstractive suffix are glossed as one suffix in this study since they only have one morphological function. Further, transcriptions only mark \(-VVl\) unless there is an overt spelling of another \((l)\) on a given root that is attested in the hieroglyphic corpus, in which case the transcription will be \(-lVVl\). The first \((VV)\) is not transcribed because it is often deleted in pronunciation and a determination of when this occurs is still unresolved. Further, for transcriptions of the abstractive suffix \(-(VVl)VVl\) this study prioritizes attested examples of the abstractive suffix \(-(VVl)VVl\) on a given word root in colonial and contemporary Ch'olan language sources and the grammatical context of use in hieroglyphic examples. This transcription method does not affect any analysis of the abstractive suffix provided here.

The grammatical context of use and examples from colonial and contemporary Ch'olan languages provide evidence that \(-(VVl)VVl\) suffix in \textit{tee'eel} ‘orchard, lineage’ is the abstractive suffix \(-(VVl)VVl\). Specifically, the grammatical context shows the \(-(VVl)VVl\) suffix on \textit{tee'eel} ‘orchard, lineage’ cannot be inflectional but must be derivational. The root of the word \textit{tee} ‘tree’ is a noun, not a verb or positional root, so it cannot take a verbal or positional root inflectional suffix. The use of \textit{tee'eel} ‘orchard, lineage’ in the examples in section (4.1) also cannot be interpreted as part of an inflectional possessive class. In such a case, \textit{tee'eel} ‘orchard, lineage’
would have to be part of a noun class that takes a \(-VVl\) suffix when it is unpossessed since it lacks a third person ergative marker that marks possession in the above examples. This would not make sense in the grammatical context, because in examples (4.7) and (4.12) potential possessors, *ch'ok* ‘unripe, youth, heir’ and *kakaw* ‘cacao’ occur immediately after. The grammatical context does allow the \(-VVl\) suffix to derive an adjective, a noun with a modifying sense, or an abstract noun. In examples (4.7) and (4.12), *tee'eel* ‘orchard, lineage’ modifies the following noun, which can be accomplished by either adjectives or adjacent nouns in Ch’olan languages (Kaufman & Norman 1984).

An examination of how the word *tee'eel* ‘orchard, lineage’ is used in colonial and contemporary Ch'olan sources can disambiguate whether the \(-VVl\) suffix in the above examples is the abstractive suffix \(-(VVl)VVl\) or one that simply derives an adjective or noun with a modifying sense. Examining the context of use of derivational affixes is essential because unlike with inflectional affixes, the use of derivational affixes can result in idiosyncratic meanings. Specifically, a given derivational affix can produce variable meanings based on the root word’s meaning. Dictionary entries from contemporary Ch'olan languages strongly suggest that the \(-Vl\) suffix on *tee'eel* ‘orchard, lineage’ is indeed the abstractive suffix \(-(VVl)VVl\). Note, that Knowles (1984) also lists *te'le* as ‘forest, wild’, but the word is actually composed of two \(-Vl\) suffixes, and final [l] is often deleted at the ends of words in contemporary Yokot'an (Chontal). No such spelling of a second [l] is indicated in the hieroglyphic corpus for *tee'eel* ‘orchard, lineage’, as discussed in chapter 6. All the cases listed in table (4.6) show only one \(-Vl\) suffix, and none with simply a modifying sense:

<table>
<thead>
<tr>
<th>Language</th>
<th>‘tree’</th>
<th>‘forest’</th>
<th>‘grandparents’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch’orti’</td>
<td>te’ ‘tree, wood, stick’</td>
<td>nukte’ ‘forest’</td>
<td>noy ‘grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>noya ‘grandmother’</td>
</tr>
<tr>
<td>Yokot’an (Chontal)</td>
<td>te’ ‘tree, wood, stick’</td>
<td>te’el ‘jungle, forest, branch’</td>
<td>mam ‘grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>mim ‘grandmother’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>nojxibpap ‘grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Note: noj ‘big’, pap ‘father’)</td>
</tr>
<tr>
<td>Ch’ol</td>
<td>te’ ‘tree, wood, stick’</td>
<td>te’el ‘small forest’</td>
<td>tatuch ‘paternal grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ńajte’el ‘small forest’</td>
<td>chuchu’ ‘grandmother’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ńajte’el ‘small forest’</td>
<td>co’äl ‘grandmother’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ńajte’el ‘small forest’</td>
<td>(Note: Sabanilla dialect only)</td>
</tr>
<tr>
<td>Colonial Ch’ol</td>
<td>te’ ‘tree, wood’</td>
<td>te’el ‘forest’</td>
<td>noj te’el ‘grandfather, grandparents’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Note: noj ‘big’, te’el ‘forest’)</td>
</tr>
</tbody>
</table>

No examples of te’el were found for colonial Ch’olti’ in the Morán Manuscript so, colonial Ch’olti’ is not listed in table (4.6) (Robertson, Law & Haertel 2010). Overall, table (4.6) shows that te’ ‘tree’ with a -Vl suffix has a general semantic sense ‘forest’. The abstractive suffix –(VVl)VVl can derive an abstract sense comparable to the suffixes -ship and -ness in English, but also has senses referring to a collection of items and their location. The semantic senses of ‘collection of’ or ‘location of’, here trees, is seen in table (4.6). Additionally, a historical dictionary of Ch’ol catalogs a dead compound word for ‘grandparents’ composed of the words noj ‘big’ and te’el ‘forest’ (Hopkins, Josserand, & Cruz Guzman 2011). Other Ch’olan languages show words for ‘grandparents’ or ‘forest’ that have some sound correspondences or incorporate the word for ‘big’. This suggests there may have been a semantic connection between the words for ‘forest’ and ‘grandparents’ historically amongst the other Ch’olan languages.
Actual examples of the use of *te* ‘tree’ with a -VL/Vl suffix from colonial and hieroglyphic texts solidify the hypothesis that the suffix is indeed the abstractive suffix –(VVI)VVI and clarify the semantic senses it derives. The only extant colonial Yokot’an (Chontal) text, *The Paxbolon Maldonado Papers*, shows that the root *te* ‘tree’ with a -VL suffix has a semantic sense of ‘forest’. This is seen in example (4.13):

(4.13)

<table>
<thead>
<tr>
<th>bixic</th>
<th>tamal</th>
<th>te-il</th>
<th>upaçaⁿ</th>
<th>ateppche</th>
</tr>
</thead>
<tbody>
<tr>
<td>bix-ik-∅</td>
<td>tamal</td>
<td>te-il</td>
<td>u=paas-an-∅</td>
<td>a-tep’che</td>
</tr>
<tr>
<td>to-go-FUT-3SG.ABS</td>
<td>PREP</td>
<td>tree-ABSTR</td>
<td>3SG.ERG=to.get-PRS-3SG.ABS</td>
<td>2SG.ERG-fugitive</td>
</tr>
</tbody>
</table>

‘He will go to the forest to get your fugitive.’

(Example from Smailus (1975, pg. 104, ln. 17-18))

In (4.13) though, the -VL suffix takes the shape of -il as opposed to -el. Example (4.14) also comes from the *Paxbolon Maldonado Papers*, and shows the suffix simply as –I

(4.14)

<table>
<thead>
<tr>
<th>tiil</th>
<th>cab</th>
<th>yithoc</th>
<th>tel</th>
<th>chutelal</th>
<th>utelal</th>
<th>uyili</th>
</tr>
</thead>
<tbody>
<tr>
<td>ti-il</td>
<td>cab</td>
<td>yit’ok</td>
<td>te-l</td>
<td>chute-l-al</td>
<td>u=te-l-al</td>
<td>uy=il-i-∅</td>
</tr>
<tr>
<td>good-ABSTR</td>
<td>earth</td>
<td>PREP</td>
<td>tree-ABSTR</td>
<td>3SG.ERG=cedar.tree-ABSTR?-POSS?</td>
<td>3SG.ERG=tree-ABSTR -POSS</td>
<td>3SG.ERG=to.see-PST=3SG.ABS</td>
</tr>
</tbody>
</table>

‘The good land with the groves, cedar groves, his orchards, he saw.’ (Example from Smailus (1975, pg. 108, ln. 4-5))

Example (4.14) shows the additional semantic sense of ‘orchard’. This is because *tel* ‘orchard’ is also possessed, as indicated by the third person clitic *u= and the additional -VL suffix, which marks some possessive classes. An orchard is simply a group, or grove, of trees that are

---

34 In the context of examples, hyphens <-> represent distinct morpheme or hieroglyphic grapheme, as discussed in chapter (2). They do not represent the writing convention that breaks up a continuous word that extends to a subsequent line.
cultivated and owned by someone. Example (4.14) may show the same word order as in
hieroglyphic texts, where *tel/tee'eel* ‘orchard’ can precede a noun to modify it. However,
example (4.14) might also demonstrate that deriving this meaning with the abstractive suffix can
be more direct, where the suffix attaches directly to the plant name *chute’* ‘cedar tree’. In the case
of *chutelal*, the morphological composition is unclear, because *chutelal* ‘cedar tree’ attests the
form -*l-al* but does not have a third person clitic *u* to mark possession. Other cases clearly attest
this more direct use of the abstractive suffix though. For example, some colonial Ch'ol place
names can be translated as ‘X grove’, such as *Chäkunte’el* ‘colored wood (sapotillo) grove’
where *chäkunte’* refers to ‘sapotillo tree’ (Aulie & Aulie 1978:182). Further, Yucatec attests the
use of -*Vl* suffixes on plant terms that do not contain *te’* ‘tree’ to mean ‘grove of X’, such as with
*’ab’al* ‘plum’ to derive the forms *x ab’alil* ~ *x ’aab’alil* ‘grove of plum trees’ (Bricker et al.

Other examples of the abstractive suffix –(*Vvl)Vvl on other nouns provide examples of
possible variations of its pronunciation and semantic senses. Like in colonial examples from
(4.13) and (4.14) the variability in the pronunciation of the abstractive suffix –(*Vvl)Vvl is also
seen in hieroglyphic texts. The most prevalent use of the abstractive suffix –(*Vvl)Vvl in
hieroglyphic texts comes when attached to the word *‘aajaaw* ‘ruler’ being pronounced as either
*-leel* or *-il* (Macri 1997). This is shown in examples (4.15) and (4.15) below:
Macri (1988, 1997) noted that all known cases of ‘aajaaw-leel and ‘aajaawiil in hieroglyphic texts exhibit the abstractive suffix –(VVl)VVl. In these cases, the abstractive suffix –(VVl)VVl derives a general abstract semantic sense, such as in the case of rulership in English, which is a general abstract noun (Macri 1988, 1997). This general abstract sense is evident because as William Norman in Justeson, Norman, and Hammond (1988) argued, such phrases of accession require an inanimate noun designating a state. Further, Macri (1988) noted similar uses in the Paxbolon Maldonado Papers, discussed below. A semantic sense of an ‘institution’ as an organized body
of people who act or work together may also be implied in such hieroglyphic examples as this is attested in colonial examples.

Colonial examples from the *Paxbolon Maldonado Papers* of the abstractive suffix –\((Vl)Vl\) on ‘ajaw ‘ruler’ attest what kind of semantic senses the abstractive suffix –\((VVl)VVl\) could have derived in hieroglyphic texts. Colonial uses show three distinct semantic senses, suggesting the abstractive suffix extended the kind of meanings it could derive over time. As with the uses of *te'el* described in examples (4.13-4.14) and tables (4.5-4.6), the abstractive suffix is used in example (4.17) to derive the semantic sense of ‘location of’:

(4.17)

<table>
<thead>
<tr>
<th>upate</th>
<th>uba</th>
<th>ta</th>
<th>ahaulely</th>
<th>cahi</th>
</tr>
</thead>
<tbody>
<tr>
<td>u=pat-e-∅</td>
<td>u=ba</td>
<td>ta</td>
<td>ajaw-lel-y</td>
<td>kah-i</td>
</tr>
<tr>
<td>3SG.ERG=to.remain-PRS-3SG.ABS</td>
<td>3SG.ERG=self</td>
<td>PREP</td>
<td>ruler-ABSTR-DEM</td>
<td>pueblo-DEM</td>
</tr>
</tbody>
</table>

‘He, himself, remained in that territory’

(Example from Smailus (1975, p. 50, ln. 6)).

In (4.17), the use of the verb *pat* ‘to remain’ with the use of the noun *kah* ‘pueblo’ establishes that the example is speaking about a physical location, specifically the ‘territory of a ruler’.

Example (4.18), shows the abstractive suffix –\((VVl)VVl\) used with *ajaw* ‘ruler’ to derive a semantic sense of ‘an institution of people’:

(4.18)

<table>
<thead>
<tr>
<th>cahix</th>
<th>utuclabel</th>
<th>upetelob</th>
<th>ahaulelbaob</th>
</tr>
</thead>
<tbody>
<tr>
<td>kah-ix</td>
<td>u=tukl-ab-el-∅</td>
<td>u=petel=ob</td>
<td>ajaw-lel-ba=ob</td>
</tr>
<tr>
<td>to.start-very</td>
<td>3ERG-to.consult-?-PRS-3ABS</td>
<td>3ERG=all=3PL</td>
<td>ruler-ABSTR-self-3PL</td>
</tr>
</tbody>
</table>

‘He started to consult everyone in the government’

(Example from Smailus (1975, p. 74, ln. 28-29)).
In (4.18), the specific semantic sense of ‘an institution of people’ is established by the noun petel ‘all/everyone’ which is possessed by the ajawlel ‘rulership/government’.

Example (4.19) demonstrates that ajawlel in the Paxbolon Maldonado Papers can exhibit a more general abstract sense, as was shown in (4.15) and (4.16) from the hieroglyphic corpus:

\[
\begin{array}{|c|c|}
\hline
\text{chumvanish} & \text{ta} \\
\text{chum-wan-ij-ix-} & \text{ta} \\
\text{to.sit-POS-?-very-3SG.ABS} & \text{PREP} \\
\hline
\end{array}
\]

Example (4.19) nearly replicates the examples (4.15) and (4.16) from the hieroglyphic corpus and thus expresses the same general abstract sense of ‘rulership’.

The examples presented in this section support that the -VVl suffix used in the examples in section (4.1) is the abstractive suffix –(VVl)VVl. More than simply deriving a modifying function with tee’eel/te’eel ‘tree’ to mean something like ‘of the forest’ the abstractive suffix –(Vl)Vl actively constructs a metaphorical sense in examples on monumental architecture, presented in section (4.1). Given the contemporary and colonial examples of the abstractive suffix –(Vl)VL in Ch’olan languages it makes sense that tee’eel/te’eel ‘orchard, lineage’ would also have the semantic senses of ‘location of’, ‘territory of’, and ‘institution of people’ in the hieroglyphic corpus. As noted, tee’eel/te’eel ‘orchard, lineage’ clearly evidences the semantic sense of ‘location of’ by having the sense of ‘a collection of trees, forest’. It also makes sense that tee’eel/te’eel ‘orchard, lineage’ could be semantically extended to have the sense of ‘territory’

\[35\] Both spellings with long vowels and short vowels are provided here, as part of general discussion of hieroglyphic, colonial, and contemporary forms.
or ‘possessed land’, given the colonial use of *ajawlel* in (4.17) and the possessed use of *te'el* from (4.14). This semantic sense would specifically be ‘orchard’, being a location of trees that one possesses. This is interpretation is also supported given that Kaufman and Justeson (2007) also note that some cases of *tee'eel* ‘orchard’ in the PSS may also identify specific cacao orchards belonging to various Mayan polities. That *tee'eel/te'el* ‘orchard, lineage’ also has a semantic sense of ‘institution of people’ is evident given that *tee'eel/te'el* ‘orchard, lineage’ also has a semantic sense of ‘grandparents’ in colonial Ch'ol. ‘Grandparents’ may express the semantic sense of ‘institution of people’ when one considers that institutional power was based on ancestors or lineages for pre-Columbian Mayan polities. This semantic sense might be more aptly labeled, ‘lineage’ then.

As discussed in chapter 2, archaeological research has found that orchards were important in establishing property rights and territory that provided wealth for entire lineages (McAnany 1995). Thus, it makes sense that *tee'eel/ te'el* ‘orchard’ would have semantically extended to have the sense of ‘lineage’. The wealth from orchards could be conceived of in terms of political and economic power, but also, in terms of the material sustenance orchards could provide for a family (McAnany 1995). Moreover, the Cross Group texts at Palenque, where most of the examples of *tee'eel* ‘orchard, lineage’ are from, describe the lineage of Palenque in great detail to establish K’inich Kan Bahlam’s right to be heir. When the abstractive suffix –*(VVI)VVI* was applied to the word root *tee'/te'* ‘tree’ in the above examples, the abstractive suffix –*(VVI)VVI* allowed the meaning to not just be semantically extended as in other cases of the abstractive suffix –*(VVI)VVI*, but *metaphorically* extended. This is a metaphorical extension because trees clearly come from a different semantic domain than institutions, such as lineages. Given the discourse and cultural context, a reader would have been forced to ask oneself in what
way a group of trees, such as an orchard, was relevant to a political institution or lineage. The abstractive suffix –(VVl)VVl thus elaborated the meaning of the metaphor through to its grammatical functions by specifying what semantic structure was provided by the semantic domain of TREES for the semantic domain of RULERS.

Given this socio-political, historical, and discursive context, ch'ok ‘unripe, youth, heir’ was likely not a dead metaphor, especially when juxtaposed with tee'eel ‘orchard, lineage’. This is especially true, given the role those with the title ch'ok ‘unripe, youth, heir’ played in encouraging the reinterpretation of tee'eel/te'el ‘orchard’ from vases to be used on monumental architecture with the semantic sense of ‘lineage’, as explained fully in chapter 6. As explained in chapter 6, the material uses of vases also encouraged this metaphoric shift of tee'eel/te'el ‘orchard’ to have the sense of ‘lineage’. The uses of vases were embedded in ritual gift exchange and feasting amongst political elites, and notably for heir designation ceremonies such as that described at the Cross Group texts (Mora-Marín 2004b).

5 The Grammatical Shape of Metaphor: Noun Incorporation

This section will demonstrate that noun incorporation is used with the RULERS ARE TREES metaphor, and commonly with other metaphors, when compared to literal expressions and that this is due to the overall genre of hieroglyphic texts as ritual texts. Again, it examines examples that also use tee’ ‘tree’ and ch'ok ‘unripe, youth, heir’. Section (5.1) presents examples of metaphors that use noun incorporation and gives frequencies of these usages. Section (5.2) presents other evidence from hieroglyphic, colonial, and contemporary sources on Mayan languages that support this analysis.
5.1 Noun Incorporation and Metaphor in the Hieroglyphic Corpus

Given the results of the author’s previous discourse analysis of the Cross Group texts at Palenque, this study searched for the verb ‘ooch ‘to enter’ in its corpus searches. In the hieroglyphic corpus, noun incorporation is marked with the suffix -aj (Law & Stuart 2017). Verbs can incorporate locative oblique arguments of intransitive verbs of motion or semantic patients of transitive verbs (Law & Stuart 2017). This kind of noun incorporation might have originated from verb-noun compounds (Law & Stuart 2017). There is only one example of noun incorporation that expresses the RULERS ARE TREES metaphor. This example is from the Cross Group Texts at Palenque, but there many other examples of the use of noun incorporation with other metaphors. The absolute frequencies of these examples are given in table (4.7):
Table 4.7. Examples of the use of noun incorporation in metaphors, their absolute frequencies, and their media type, provenance, and time period based on data from the *Maya Hieroglyphic Database*.

Table (4.7) shows there are seventeen instances of noun incorporation of the verb *ooch* ‘to enter’ that are used in a metaphor and only five instances of noun incorporation with the verb *ooch* that are not clearly metaphorical. These cases could be literal locative statements or from an ambiguous context that is not clearly translatable, such as in some cases of glyphic under-spelling. Metaphorical cases are mostly from monumental architecture with some are from
portable objects like vases, while there is a more even distribution across media types for nonmetaphorical cases. Metaphorical cases have a more even distribution across time periods as well, though for many examples of noun incorporation of the verb 'ooch 'to enter’ the date is unknown. For nonmetaphorical cases, there are no attested examples from the Late Classic. Examples of noun incorporation of the verb 'ooch 'to enter’ come from a variety of sites but, Palenque attests the most. There are no examples of the noun incorporation of the verb 'ooch 'to enter’ in the codices.

Example (4.20) shows the only example of noun incorporation with the RULERS ARE TREES metaphor. Example (4.20) is again from the Cross Group texts at Palenque and describes the ritual process ruler K'inich Kan Bahlam underwent to be designated as heir to the throne of Palenque:

(4.20)

<table>
<thead>
<tr>
<th>YUWAL-'OCH-TE'-ja</th>
</tr>
</thead>
<tbody>
<tr>
<td>yuuwal 'ooch-tee'-aj-∅</td>
</tr>
<tr>
<td>and.then.to.enter-tree-INTR-3SG.ABS</td>
</tr>
</tbody>
</table>

‘And then, he orchard-entered’ / ‘And then, he became part of the lineage’

(Temple of the Sun, glyph block Q13, Palenque; drawing by Linda Schele © David Schele (2000:SD-171); photo courtesy of Ancient Americas at LACMA (ancientamericas.org); cropped by author; transliteration courtesy of The Maya Hieroglyphic Database Project).

36 Though this drawing is done by Linda Schele, Merle Greene Robertson’s (1991: figure 95) version shows a conflation of T765/AP5 with a logograph for <TE> ‘tree’ through the use of the ‘tree’ classifier that consists of a line and two semi-circles, discussed in chapter (2). This semantic classifier is placed at the top of the jaw of T765/AP5.
Example (4.20) exhibits noun incorporation with the suffix -aj that occurs after both the verb 'ooch ‘to enter’ and the noun tee ‘tree’. Specifically, this study argues tee is a phonetic reduction of tee'eel ‘orchard, lineage’ in the next section (5.2). That this is a verbal predicate is also indicated by the use of the particle yuwal meaning something like ‘and then’ that denotes a subsequent action. The interpretation of T765/AP5 verb as <$’OCH> 'ooch ‘to enter’ will also be discussed in the next section (5.2). As with many examples from section (4), example (4.20) describes the ruler’s new elite position using the word tee'eel ‘orchard, lineage’ from the semantic domain of TREES, and thus exhibits the RULERS ARE TREES metaphor. It also utilizes a verb of motion 'ooch ‘to enter’ to describe a change of state, here that of becoming an heir.

Example (4.20) thus exhibits the more general metaphor STATES ARE LOCATIONS where it is entailed that motion results in a new location of an entity and thus a new state for that entity.

A similar grammatical pattern is also seen with other metaphors in the hieroglyphic corpus. Example (4.21) shows noun incorporation with the verb 'ooch and a metaphor for death that has also been described by Hull (2003):

(4.21)

<table>
<thead>
<tr>
<th>YUWAL-'OCH-B'TH-JA</th>
</tr>
</thead>
<tbody>
<tr>
<td>yuuwal 'ooch-b'iih-aj-∅</td>
</tr>
<tr>
<td>and.then to.enter-road-INTR-3SG.ABS</td>
</tr>
</tbody>
</table>

‘And then, he road-entered’ / ‘And then, he died’

(Panel 2, glyph block I07, La Corona; transliteration courtesy of The Maya Hieroglyphic Database).

Example (4.21) exhibits noun incorporation with the suffix -aj occurring after the verb 'ooch ‘to enter’ and the noun b'iih ‘road’. It also uses the particle yuwal ‘and then’, indicating a verbal
predicate follows. Interestingly, example (4.21) uses a different glyph for 'ooch 'to enter’, T221b/MZ4. In example (4.21), death, a change of state, is described as an act of motion with the verb 'ooch ‘to enter’ and a place where this motion typically occurs, b'iih ‘road’. This again utilizes the more general metaphor STATES ARE LOCATIONS and perhaps more specifically, the metaphor LIFE IS A JOURNEY. It is interesting to note that unlike English uses of this metaphor, death seems to be described as the beginning of a journey, as opposed to the end of one. For example, in English, one might describe death by saying *They’ve come to the end of their road.* Further, that example (4.21) is a metaphor for death is affirmed because the elaborate recording of the chronologies of rulers’ lives in hieroglyphic texts has helped scholars specify dates of events, such as death.

Example (4.22) shows the use of the same metaphor in (4.22) with noun incorporation, but uses another glyphic spelling for 'ooch ‘to enter’ with glyph T213v/ACD and omits the particle yuuwal ‘and then’:

(4.22)

| 'OCH-B'TH-ja |
|'ooch-b'iih-aj-∅ |
to.enter-road-INTR-3SG.ABS

‘He road-entered’ / ‘He died’

(Sculptured Stone 4, glyph block H01 Bonampak, transliteration courtesy of *The Maya Hieroglyphic Database*).

Example (4.23) shows another metaphor for death that uses noun incorporation, which has also previously been described by Hull (2003):
In example (4.23), the suffix -aj is used after the verb 'ooch ‘to enter’ and the noun ha‘ ‘water’. It also shows the use of a different glyph to spell 'ooch ‘to enter’, here T361/MZ4. Again, the general metaphor expressed might be STATES ARE LOCATIONS given the use of the verb of motion 'ooch ‘to enter’ to express the change of state of death. The location of ha‘ ‘water’ might specifically reference the underworld, which is often conceptualized as being a place of water.

In contrast to the above examples, example (4.24) shows an example of the use of the verb 'ooch ‘to enter’ without noun incorporation and perhaps expresses a nonmetaphorical, or literal, meaning:

(4.24)

<table>
<thead>
<tr>
<th>Image unavailable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>'OCH-OTOT-NAH</td>
</tr>
<tr>
<td>'ooch 'oot naah</td>
</tr>
<tr>
<td>to.enter house</td>
</tr>
<tr>
<td>‘to enter the house’</td>
</tr>
</tbody>
</table>

(Example from, House A, Pier C, glyph block M27, Palenque; transliteration courtesy of The Maya Hieroglyphic Database Project).
Example (4.24) does not use the suffix -aj that is used in noun incorporation. Further, the location of 'ootoot ‘house’ or naah ‘house’ has a plausible physical correlate, suggesting that this is a nonmetaphorical usage that references the act of physically entering a building.

That noun incorporation of the verb 'ooch ‘to enter’ is used more often with metaphorical constructions is in line with foundational research on the relationship between metaphor and grammar. Deignan (2005) has found that metaphorical usages of a given word tend to use one inflectional form over others, while nonmetaphorical usages of that word tend to use a different inflectional form or use more of a variety of these forms. Table (4.7) above clearly demonstrates that most examples of noun incorporation of the verb 'ooch ‘to enter’ are indeed used in metaphorical constructions and the examples presented elaborate how noun incorporation is used in such metaphorical constructions. These findings make sense given that noun incorporation of verbs is generally more prevalent in the genre of ritual speech in the Ch’olan language Ch’orti’, which is similar to the genre of the Mayan hieroglyphic texts (Hull 2009). That noun incorporation is more likely to be used with the verb 'ooch ‘to enter’ in metaphorical constructions may partially be an effect of genre. Further, it is not uncommon for metaphors in many of the world’s languages to use verbs of motion with meanings such as ‘to enter’, or other spatial markers to describe changes of states (Lakoff & Johnson 1980). Though the use of verbs of motion and other spatial language may be lexicalized, or ‘dead metaphors’ in many languages, the verb 'ooch ‘to enter’ was clearly used as an important element of the genre of ritual speech and metaphorical constructions.
5.2 Justifying the Noun Incorporation Interpretation

As noted in section (4.1), the glyph T765/AP5 has been interpreted as both '<OCH> 'ooch ‘to enter’ and '<OK> 'ook ‘foot/leg, base’ in other cases. An interpretation of T765/AP5 as '<OK> 'ook ‘foot/leg, base’ is also seen in example (4.25):

(4.25)

<table>
<thead>
<tr>
<th>NOJ-CHAN-yo-'OK-K'IIN-ni</th>
</tr>
</thead>
<tbody>
<tr>
<td>noj chan y-ook k'iin</td>
</tr>
<tr>
<td>big sky 3SG.ERG-foot/leg/base sun</td>
</tr>
<tr>
<td>‘The sun’s foot/leg/base is big/large/south(ern) sky?’</td>
</tr>
</tbody>
</table>

(Monument 1, Stela A, glyph block C11, Quiriguá; drawing by Matt Looper; photo and transliteration courtesy of The Maya Hieroglyphic Database).

Like with example (4.10), in example (4.25), the hieroglyph T765/AP5 is clearly read as 'ook ‘foot/leg, base’, a noun, because it is possessed with third person possessive marker y-. Since this is part of a name for a ruler, it is hard to know the exact meaning of T765/AP5 in example (4.25), but it cannot be read as the verb 'ooch ‘to enter’.

As noted in section (5.1), a reading of 'ooch ‘to enter’ for hieroglyph T765/AP5 in example (4.20) is still affirmed because of the grammar used in the example. Example (4.20) attests the discourse particle yuuwal ‘and then’ that introduces verbs and the suffix -aj which incorporates nouns with verbs. Additionally, the previous section presented similar examples of other metaphors that incorporate nouns with the verb 'ooch ‘to enter’ when other hieroglyphs for < 'OCH> 'ooch ‘to enter’ are used. A reading of the hieroglyph T765/AP5 as a verb 'ooch ‘to enter’ instead of 'ook ‘foot/leg, base’ is also affirmed when examining the linguistic history of
these near homophonous forms and how they were spelled in hieroglyphic and colonial texts. The ancestor of Greater Tzeltalan experienced a sound change where voiceless velar stops [k], turned into the voiceless alveo-palatal affricate [ch], which was passed down to pre-Ch'olan (Kaufman & Norman 1984). However, proto-Yucatec retained the [k] pronunciation for the words affected by the [k] > [ch] shift for the ancestor of Greater Tzeltalan (Justeson 2018 personal communication). The words 'ook ‘foot/leg, base’ and 'ook ‘to enter’ were thus pronounced the same in proto-Yucatec (Justeson 2018 personal communication). Proto-Yucatec speakers also wrote hieroglyphic texts, but their influence on the language of the texts has been argued to be more limited (Lacadena & Wichmann 1999). Thus, it was possible that before the [k] > [ch] shift, 'ooch ‘to enter’ and 'ook ‘foot/leg, base’ were spelled the same way. Palenque may have reinterpreted the pronunciation and meaning of glyph T765/AP5 based on older spellings (Justeson 2018 personal communication).

Further, as discussed in chapter (2), polyvalence is a common part of Mayan hieroglyphic writing given its highly multimodal quality (Mora-Marín 2020). It is not uncommon for Mayan hieroglyphic texts to play with the image of a glyph to evoke meanings beyond what is suggested by linguistic interpretation. It is also not uncommon to use sound similarities to elude to similarities in meanings, particularly in speech play or for poetic effect, as is attested in many Mayan languages and discussed in chapter 2 (e.g. Stross 1975). As discussed throughout this work, Palenque shows a number of novel innovations in its hieroglyphic texts so it would not be surprising if scribes at Palenque also used glyph T765/AP5 in a novel way. For example, scribes may have wanted to evoke other uses glyph T765/AP5 has in spelling a particular deity’s name, who is featured prominently in the art of the Cross Group monuments. The deity’s name, B’olon Yooktee’ ‘nine his tree base’, is shown in example (4.26):
(4.26)

<table>
<thead>
<tr>
<th>B'OLON-'OK-TE'-K'UH</th>
</tr>
</thead>
<tbody>
<tr>
<td>b'olon yook tee k'uuh</td>
</tr>
<tr>
<td>nine 3SG.ERG-foot/leg/base tree holy</td>
</tr>
<tr>
<td>‘Holy nine his tree foot/leg/base?’</td>
</tr>
</tbody>
</table>

(Photo by Kerr (n.d.-b: K1398); digital image courtesy of Justin Kerr; cropped by author).

Interpreting what precisely *B'olon Yooktee'* means is difficult because Mayan names often use numerals that can seem elusive from the perspective of western culture. The speech play exhibited at Palenque may also establish why Yaxchilan, shown in example (4.10), attests a different use of T765/AP5 to spell *< 'OK>'ook* ‘foot/leg, base’.

Other examples from the Cross Group texts at Palenque suggest that *tee'eel* ‘orchard, lineage’ is underlying and phonetically reduced in example (4.20). Example (4.27), repeated from example (4.8), shows an unreduced example of *tee'eel* ‘orchard, lineage’ with *'ooch* ‘to enter’:
Example (4.27) thus suggests that *tee* is a phonetically reduced spelling of *tee'eel* ‘orchard, lineage’ in example (4.20). Additionally, example (4.27) juxtaposes *tee'eel* ‘orchard, lineage’ with *ch'ok* ‘unripe, youth, heir’ in a similar way to example (4.7), thus suggesting a similar metaphorical meaning.

Example (4.28) provides more context for understanding the use of *'oochtee'eel* ‘entering the orchard / becoming a part of the lineage’ with the predicate *k'al* ‘to wrap, to complete’:
Example (4.28) specifically connects 'oochtee'eel ‘entering the orchard / becoming a part of the lineage’ with commemoration, or rituals, as this is the typical context of use of the predicate k'al ‘to wrap, to complete. Specifically, in example (4.28), the rituals commemorated would be that of becoming an heir, the topic of the Cross Group texts.

Evidence from the colonial Paxbolon Maldonado Papers also suggests that example (4.21) exhibits the abstractive suffix –(VVI)VVI on 'oochtee'eel ‘entering the orchard / becoming a part of the lineage’. Example (4.29) shows that the verb 'och ‘to enter’ can be used with a preposition and a noun with the abstractive suffix –(VVI)VVI:
In example (4.29), the verb 'och ‘to enter’ is used with a preposition and a Spanish loan word for ‘christian’ with the abstractive suffix –il to indicate the general change of state of becoming a Christian.

Given examples (4.27-4.29), example (4.20) should be interpreted as having the underlying form of 'ooch ta tee'eel ‘to enter the orchard/to become a part of the lineage’ that is incorporated in the form 'oochtee'aj ‘orchard entering/becoming a part of the lineage’.

Hieroglyphic examples provide evidence for why the abstractive suffix –(VVl)VVL would be deleted when incorporated with a verb. Hieroglyphic examples, as is common in Mayan languages, show that some sounds are frequently deleted at the end of syllables, such as [l] (Law & Stuart 2017). Mayan languages also typically do not allow multiple vowels to occur in a row, as is true in hieroglyphic texts (Law & Stuart 2017). If tee'eel was incorporated with 'ooch it would underlyingly have the form 'ooch-tee'-eel-aj. Phonological rules would require that 'ooch-tee'-eel-aj delete the [l] of the abstractive suffix –(VVL)VVL first, leaving 'ooch-tee'ee-aj. In this form, there would be too many vowels in a row, so that the [ee] of the abstractive suffix -eel would be deleted as well, leaving simply 'ooch-tee'-aj.

Hieroglyph T765/AP5 in example (4.20) from the Cross Group texts should thus be interpreted as the verb 'ooch ‘to enter’, which was purposefully elaborated upon to draw readers’ attention to it. The Cross Group texts focus on how the ruler K'inich Kan Bahlam must go
through a ritual process to change his social status into being an heir to the throne of Palenque, and 'ooch ‘to enter’ was shown to be used to describe such contexts. Further, it makes sense that 'ooch ‘to enter’ was incorporated with tee’eel ‘orchard, lineage’ because it was demonstrated in section (4.2) that the abstractive suffix –(VVl)Vvl could derive a semantic sense of a location, in addition to general abstract states. As discussed in this section, locations are what is typically incorporated with a verb when it is intransitive, such as with the verb 'ooch ‘to enter’.

6 The Semantic Shape of Metaphor: Variation and Semantic Structure in Writing

The metaphor RULERS ARE TREES materialized through the use of specific grammatical forms, in line with other research on metaphor and grammar and research on the genre of Mayan ritual texts which shows the use of some grammatical forms more frequently than others. The metaphor also materialized through the use of a very limited set of vocabulary, since only a limited set from the domain of PLANTS, and more narrowly TREES, was attested at all in hieroglyphic texts. This vocabulary favored kinds of plants and plant foodstuffs. The vocabulary used in the examples examined here from the semantic domain of TREES included only tee’ ‘tree’, tee’eel ‘orchard, lineage’, wii’ ‘root’ and ch’ok ‘unripe, youth, heir’. This vocabulary merely references the semantic domain itself, TREES, and a few entities and attributes of these entities from the domain. This vocabulary was also only used to refer to political elites directly and the different stages of political life these elites went through. This limited use of vocabulary is also partly due to the genre of Mayan hieroglyphic texts, being very formulaic and focusing on a few select topics, mainly the lives of rulers and the cosmological system that justifies their rule. This suggests that whatever meanings Mayan writers and readers had associated with the metaphor was not made fully evident in writing. The metaphor, when expressed in the modality of writing,
thus shows little elaboration of its semantic structure. The communicative affordances of the modality of the writing and the formulaic nature of the genre of hieroglyphic texts, allowed scribes to not elaborate, or explicitly detail, every aspect of the metaphor. Referencing a few elements of a given domain was sufficient to reference it in its totality.

The metaphor is also not fully elaborated given that there is little evidence in writing of the metaphorical reasoning behind the metaphor, where it is not explicitly expressed in what way the semantic domain of TREES provides semantic structure for the domain of RULERS. The use of tee'eel ‘orchard, lineage’ in novel metaphorical examples provides evidence of some of this reasoning. Use of tee'eel ‘orchard, lineage’ implies a group of rulers, or a lineage, would be an orchard only if individual rulers are conceptualized as individual trees. Some uses of tee’ ‘tree’ on its own in elite titles may attest a different metaphorical reasoning, or model, of the metaphor RULERS ARE TREES. For example, the title of a lineage founder wii’ ch’ok? tee’ naah ‘root, unripe?, tree house’, suggests that a lineage is conceived of as part of a single structure, here, a house or a tree. The use of wii’ ‘root’ implies the lineage founder is the basis for physical support for a tree or building, or the lineage, since trees or buildings do not share roots or foundations with other trees or buildings. Finally, the use of ’ooch ‘to enter’ also shows some evidence of metaphorical reasoning by elaborating a process applied to the entities of the semantic domain of TREES. The process is, of course, that of becoming an heir, or part of a political lineage, as discussed in section (4). As discussed, the use of ’ooch ‘to enter’ in this context makes sense given that changes of location are used in other cases to denote changes of states, such as death, in hieroglyphic texts.

Further, the metaphor RULERS ARE TREES, and models of it, may evidence that the semantic structure can be metaphorically composed, or made of more than one metaphor. This
was seen with the title of a lineage founder *wii' ch'ok? tee' naah* ‘root, unripe?, tree house’ that possibly uses both the metaphor *RULERS ARE TREES* with the metaphor *POLITICAL LINEAGES ARE BUILDINGS*. Attested uses of *tee'eel* ‘orchard, lineage’ with elements of the lineage founder title suggest composing of the metaphorical model of a lineage as a collection of trees, or orchards, with the *POLITICAL LINEAGES ARE BUILDING METAPHOR*. These examples also thus show metaphorical composing was occurring across examples and texts.

Variation of the metaphor in writing and metaphoric composing within and across examples shows that the semantic structure of the metaphor *RULERS ARE TREES* is also not fully elaborated because it is *coherent* and not *compositional*. By *compositional*, this study means that the semantic elements of each semantic domain in a metaphor are analogically equivalent with each other in a one-to-one correspondence. By *coherent*, this study means what is represented in the semantic structure of the metaphor does not have contradicting parts and merely shares various elements or knowledge between domains. In a merely coherent structure, it is not spelled out how every element of a semantic domain corresponds to another. The example of lineage founder title *wii' ch'ok? tee' naah* ‘root, unripe?, tree house’ is coherent, but not compositional, because the meanings of *wii’ root* and *ch'ok* ‘unripe, youth, heir’ share the attribute of being the origination or basis of something, but *wii’ root* refers to an anatomical part of a plant and *ch'ok* ‘unripe, youth, heir’ refers to an attribute of a plant. The source domains of *BUILDINGS* and *PLANTS* used in the title share the entity of *tee’ tree* that is both a material for a building and a kind of plant. The different metaphorical models of lineages being a collection of trees or an individual tree are also not compositional but coherent with each other. Referencing lineages as a collection of trees or an individual tree can be viewed as being based on the very same
knowledge of the semantic domain of TREES. As noted above, orchards or trees, generally provided sustenance, material wealth, and political power.

That the metaphor in writing, or language broadly, shows such variation, is not fully elaborated, and has merely a coherent semantic structure, argues against some of the tenets of Conceptual Metaphor Theory. As noted in chapter 3, Conceptual Metaphor Theory’s Invariance Principle argues that in metaphorical entailments, or cognitive processing of metaphors, there is a transference of as much knowledge, or semantic structure, as possible from the target domain to a source domain (Lakoff & Johnson 1980). Possibility is traditionally defined in CMT as coherence, but the actual modeling of the semantic structure of a metaphor in CMT analyses is done in a fully elaborated, compositional, and analogic fashion. Variation of the metaphor RULERS ARE TREES shows that any lack of elaboration of the metaphor in writing was due to the semantic structure being indeterminate, or having competing models, that were variably interpreted. These uses simply needed to provide a coherent version of the metaphor with other uses.

7 Conclusion

In conclusion, this chapter showed that the metaphor RULERS ARE TREES materializes in the modality of writing in Mayan hieroglyphic texts through the use of distinct grammatical forms. Specifically, the abstractive suffix –(VVl)VVl, which derives abstract nouns from other nouns and adjectives, and noun incorporation of verbs, is used with this metaphor. The use of the abstractive suffix –(VVl)VVl was shown to be used with the metaphor because of its grammatical function. The grammatical function of the abstractive suffix –(VVl)VVl, when applied in a novel context of a different domain, extended the meaning of the word root to have metaphorical sense,
specifically deriving a meaning ‘of lineage’ from the semantic sense of ‘tree’. Noun incorporation was used more often than not with metaphorical constructions when compared to literal, or nonmetaphorical, counterparts, in accordance with other research on metaphor and grammar. This may be because of the genre features of Mayan hieroglyphic texts. This chapter also showed that when expressed in the modality of writing the semantic structure of the metaphor RULERS ARE TREES is not fully elaborated. The metaphor as expressed in the modality of writing is not fully elaborated in terms of the vocabulary used, the semantic entities and processes it describes, and the metaphorical reasoning it evidences. It was also shown to be not fully elaborated given that the modality of writing afforded that the metaphor was expressed coherently, rather than compositionally. Coherence allows a metaphor to be indeterminate but acceptable if the metaphor is coherent with other uses of the metaphor and knowledge of the semantic domains used in the metaphor. This challenges a key aspect of Conceptual Metaphor Theory which assumes the semantic structure will be fully elaborated and compositional. Finally, the metaphor analysis presented here challenges and expands interpretations of some examples in Mayan hieroglyphic texts by elaborating the relationship between grammatical form and semantic structure. In the next chapter, chapter 5, this study shows that metaphors in pictorial images in Mayan hieroglyphic texts, take a different shape than metaphors in writing because they are only afforded the possibility to be compositional even when depicting knowledge of processes or events.
Chapter 5 – The Visual Shape of Metaphor

1 Introduction

If metaphor has a unique linguistic shape, then what exactly is the visual shape of metaphor? The previous chapter, chapter 4, demonstrated that the conceptual metaphor RULERS ARE TREES materializes in language through the use of distinct grammatical forms, in line with other corpus research on metaphor (e.g. Deignan 2005; Sullivan 2009). In chapter 3, it was also noted that Conceptual Metaphor Theory (Lakoff & Johnson 1980) leaves unexplained what a given conceptual metaphor should look like across modalities. This chapter thus focuses on how the conceptual metaphor RULERS ARE TREES materializes in pictorial images in Mayan hieroglyphic texts, that is, non-written images, to examine how the materialization of the metaphor may vary across modalities.

Part of this comparison of modalities looks at differences in how the metaphor materializes in the written language of Mayan hieroglyphic texts broadly, as discussed in chapter 4. First, this chapter demonstrates that the conceptual metaphor RULERS ARE TREES materializes in pictorial images through the superimposition or fusion of human body parts with tree parts, though it is variable precisely which human body parts and tree parts are utilized. The materialization of the metaphor in pictorial images is thus more elaborate and compositional than the metaphor’s expression in writing in Mayan hieroglyphic texts.

Another part of this comparison looks at differences in how visual relationships are expressed in Ch'olan Mayan languages compared to the visual depiction of the metaphor in pictorial images. Some visual relationships expressed in Ch'olan Mayan languages utilize human
body part vocabulary, known as relational nouns. Other relevant vocabulary includes polysemous vocabulary that has semantic senses from the domains of the HUMAN BODY and PLANTS that are based on visual similarities between the domains. Though not necessarily used in the linguistic materialization of the metaphor, this vocabulary’s encoding of visual relationships and use of closely related domains to the RULERS ARE TREES metaphor, makes their consideration relevant in a comparison of modalities. More directly, this vocabulary encodes the visual mapping of human body parts with plant parts, which is seen in the visual materialization of the metaphor RULERS ARE TREES. Further, it has long been a practice in Mayan hieroglyphic research to use such polysemous vocabulary to interpret pictorial images in Mayan hieroglyphic texts. This chapter demonstrates that the superimposition or fusion of human body parts and tree parts used to express the visual metaphor does not necessarily match the visual relationships expressed by polysemous body part and plant part vocabulary in Ch'olan Mayan languages.

This chapter argues these results can be explained through appeal to the communicative affordances of the modalities in question and the metaphor’s semantic structure. The modality of pictorial images makes it necessary to depict a compositional, and thus more elaborate, semantic structure where all shared attributes between domains are fully depicted. Variation of how the visual metaphor is depicted might be due to the metaphor not only mapping shared attributes between rulers and trees in its semantic structure but instead, the aspects of the lifecycle of a tree with the lifecycle of a ruler. Variation of how the visual metaphor is depicted is due to entailments of the metaphor being variable where there are two distinct models. Like in writing, the visual metaphor may depict a lineage of rulers as a collection of trees or a single tree. What human body parts and plant parts are depicted in the visual metaphor is also due to a principle regarding the salience of semantic properties. This principle claims that the semantic material
transferred in a metaphor is dependent on the relative salience of properties in the source and target domains. That the visual metaphor does not necessarily depict the visual relationships expressed by polysemous vocabulary is also due to the principle of asymmetry of metaphorical mappings. The principle of asymmetry contends that the transference of semantic material from the source domain to the target domain is unidirectional and cannot be reversed. Thus, the visual materialization of the metaphor RULERS ARE TREES is not merely a direct representation or depiction of how the metaphor is expressed in language and writing nor beholden to how visual relationships are expressed in a given language.

Section (2) discusses how this study searched for and identified metaphors in pictorial images. Section (3) describes polysemous body part and plant part vocabulary that encodes visual relationships in Ch'olan Mayan languages. Section (4) discusses relevant visual metaphors in Mayan hieroglyphic texts. Specifically, section (4.1) describes and presents examples of the metaphor RULERS ARE TREES as they materialize in pictorial images. Section (4.2) describes and presents related visual metaphors to justify this study’s labeling of the metaphor as RULERS ARE TREES. Section (5) accounts for the variation of the metaphor in pictorial images by appealing to the communicative affordances of this modality and the metaphor’s semantic structure. Section (6) provides a summary and conclusion.

2 Searching for Visual Metaphors

This study ran most of its searches for visual metaphors manually where each image of a vase, monumental architecture, or codex, was examined individually for examples of the visual metaphor RULERS ARE TREES. Some automated searches of vases from The Maya Vase Database (Kerr n.d.-b) and of codices from The Maya Codices Database, Version 5.0 (Vail & Hernández
2018) were possible due to labeling of images in these databases by their authors. Like searching for metaphor in language, this study utilized the source domain TREES in these automated searches. This study did not use the target domain of RULERS because this was not a search option in the databases. Further, this study only searched for images of trees directly because of the labeling available in these databases, which would necessarily include other elements of the semantic domain of TREES such as branches and leaves, etc. Manual and automated searches complemented each other, allowing for consideration of the context of this study’s identification of trees while also checking the results against what other researchers have identified. Manual searches also involved close examination of how the target domain RULERS was depicted.

Like with metaphors in language, identifying whether a depiction of a tree or ruler was representing the metaphor RULERS ARE TREES was ultimately determined by whether the semantic domain of TREES provided semantic structure for the domain of RULERS, and was not limited to a particular visual form. However, given the historical setting, part of the context may be unknown that might help determine if an image was metaphorical. This study thus only counted images that superimposed or fused human body parts and tree parts as an instance of the metaphor when the human depicted was believed to be a ruler. The superimposition or fusion of human body parts and tree parts shows the reference to the semantic domain of TREES and RULERS at the same time, suggesting the transference of semantic structure between the domains.

As discussed in chapter 3, visual metaphor researchers, like corpus metaphor researchers, have demonstrated that conceptual metaphors materialize in distinct forms despite accepting a conceptual definition of metaphor (e.g. Forceville 2004). Forceville (2004) provides a typology of some of these kinds of forms. Relevant to this study is a hybrid metaphor where a single object or gestalt depicts parts from different semantic domains (Forceville 2004). Examples
depicting the superimposition or fusion of human body parts and tree parts discussed in this chapter meet this definition by depicting a ruler with both elements from the domains of the **HUMAN BODY** and **TREES**. Figure (5.1) shows another example of a hybrid metaphor, where computer components are put in place of musical notes in a musical composition in an advertisement (Forceville 2004):

Figure 5.1. Example of a hybrid metaphor in an advertisement (after Forceville 2004; edited by author).

The hybrid metaphor in figure (5.1) suggests that using Intel computers allows for creative expression, like with music (Forceville 2004). The writing in the advertisement reinforces this interpretation as well, calling the computer owner a *maestro* and labeling the musical notes as various computer operations (Forceville 2004). Other kinds of visual metaphor include *contextual metaphors* where an object or gestalt occurs in a novel context. Figure (5.2) shows an example of a contextual metaphor where an advertisement depicts a cigarette pack in a soap dish in a bathtub, where normally a bar of soap would be placed (Forceville 2004):
The contextual metaphor in figure (5.2) suggests that this brand of cigarettes is just as essential as soap in relaxing, such as while taking a bath, and thus makes one feel refreshed. Another kind of visual metaphor is a *pictorial simile* where one object is visually juxtaposed with another from a different semantic domain (Forceville 2004). Figure (5.3) shows an example of a pictorial simile where a tower of Pisa is juxtaposed with a glass of beer:

Figure 5.2. Example of contextual metaphor in an advertisement (after Forceville 2004; edited by author).

Figure 5.3. Example of a pictorial simile in an advertisement (after Forceville 2004; edited by author).
The text in figure (5.3) translates to ‘But we have Dommelsch!’, the brand of beer being advertised (Forceville 2004). The pictorial simile in figure (5.3) suggests that the beer is a reason for national pride, just like the tower of Pisa is for Italy (Forceville 2004). Finally, an *embodied metaphor* is a type of visual metaphor where an object is represented in its entirety to resemble another object from a different semantic domain by blending visual features from both domains (Forceville 2004). Figure (5.4) shows an example of an embodied metaphor where a coffee machine takes the shape of a human hand, more specifically, that of a servant:

Figure 5.4. Example of an embodied metaphor in an advertisement (after Forceville 2004; edited by author).

Figure (5.4) shows an example of an embodied metaphor where the shape and angle of the coffee machine itself resembles a servant’s hand pouring coffee. In historical settings, contextual metaphors, pictorial similes, and embodied metaphors may not be easily identified if all of the historical context is not known. Contextual metaphors rely on knowing the normal context of where objects occur, and pictorial similes rely on understanding relevant similarities between the two items that are juxtaposed. Embodied metaphors may blend visual features to such a degree
that they are not identifiable as coming from different semantic domains without the full context. Further, figures (5.1-5.3) are multimodal, where writing strongly informs the relevant context for interpreting the visual metaphor, making interpreting visual metaphors on their own more difficult. Thus, contextual metaphors, pictorial similes, and embodied metaphors were not included as instances of the metaphor *RULERS ARE TREES*. Future research that can examine the context of each instance of the metaphor in more depth may find it relevant to include such examples. Writing accompanying examples of the *RULERS ARE TREES* metaphor in pictorial images is also considered in the analysis here.

Identifying the form, or kind, of visual metaphor does not necessarily indicate what is the source domain and what is the target domain. In language, the target domain is often the subject of a sentence or topic of a text, which is not necessarily distinguishable in images (Indurkhya and Ojha 2017). Further, as noted in chapter 3, in the modality of language source and target domains cannot be reversed without a substantial change in meaning. For example, the linguistic metaphor *Those billboards are warts*, where *BILLBOARDS* is the target domain and *WARTS* is the source domain, might mean that billboards are ugly obtrusions on a skyline (Indurkhya and Ojha 2017). However, the reverse, *Those warts are billboards*, where *WARTS* is the target domain and *BILLBOARDS* is the source domain, might have a substantially different meaning (Indurkhya and Ojha 2017). The meaning might be that warts are blatantly advertising something negative about a person’s character. This has led some researchers to argue that visual metaphors are reversible, unlike language (Carrol 1994). However, Indurkhya and Ojha (2017) have found that context plays a key role in identifying the source and target domains in visual metaphors and that the meaning is substantially changed if the source domain and target domain are reversed in interpretations of a visual metaphor. Identifying if the semantic domain of *TREES* or the semantic
domain of RULERS is the source domain or target domain in a given visual example is discussed in comparison to related visual metaphors in section (4.2).

Section (4.2) also justifies the verbal label of TREES and RULERS for the semantic domains involved in the metaphor. In a conceptual approach to metaphor, it is problematic to prioritize or treat as primary, one modality, over another (Forceville 2009). Labeling a visual metaphor with verbal labels may bring unintended connotations (Forceville 2009). A discussion of how to label the semantic domains of the metaphor is relevant for this chapter because the metaphor is much more variable and elaborate in images than in writing. If the labeling of domains accounts for this variability, then, this labeling will account for the metaphor in writing. To identify the source and target domains and give them verbal labels, this study considers the linguistic, historical, and cultural contexts, and other metaphor research.

3 Polysemous Body Part and Plant Part Vocabulary in Ch'olan Languages

This section reviews both polysemous body part and plant part vocabulary in Ch'olan languages. This polysemous vocabulary is relevant to the metaphor RULERS ARE TREES because it uses the related, more general semantic domains of the HUMAN BODY and PLANTS. Some of this vocabulary, called relational nouns, has extended body part terms metaphorically to express visual relationships, including those pertaining to plants. Further, studies on body part terms in Mayan languages show the domain of PLANTS has been extended metaphorically to the HUMAN BODY, and that this extension might be due to similarities in visual properties between the two domains (Brown & Witkowski 1981; Stross 1975). Section (3.1) reviews relational nouns that utilize body part vocabulary, and section (3.2) reviews other polysemous body part and plant part vocabulary.
3.1 Relational Nouns

Relational nouns are typically formed from polysemous body part vocabulary that is used to describe mereological, spatial, and grammatical relationships in Ch'olan and other Mayan languages. Relational nouns are also considered an areal trait of Mesoamerican languages broadly (Campbell, Kaufman, & Smith-Stark 1986:546). Grammatically, relational nouns consist of a noun root with affixes or clitics that are also used to mark possessive constructions (Campbell, Kaufman, & Smith-Stark 1986:546). Some relational nouns, though, are not homophonous with or semantically related to body part terms (e.g. Broadwell 2005; Coon 2009). Relational nouns are of interest here because those that are based on polysemous body part vocabulary were at least once understood and extended metaphorically, such as in Mixtecan languages (Hollenbach 1995). The semantic domain of the HUMAN BODY was clearly used to provide semantic structure for the semantic domains of OBJECTS and SPACE, perhaps being related to widespread Mesoamerican beliefs of an animate, personified, universe. However, some of these relational nouns are used for strictly grammatical functions, such as acting as complementizers (e.g. Hollenbach 1995; Coon 2009). Some researchers argue that since many relational nouns have evolved to have the grammatical category of prepositions, they cannot be metaphorically processed synchronically (Broadwell 2001; Broadwell 2005; Lillehaugen & Sonnenschein 2012).

In Ch'olan languages, eight relational nouns have been reconstructed (Kaufman & Norman 1984). Five are used in locative constructions, and three for marking grammatical case as shown in table (5.1):
Some of these relational nouns are attested in Mayan hieroglyphic texts, in addition to others that utilize body part vocabulary, such as *ti’ ‘mouth’ and *pat ‘back’. As is true in Ch’olan languages in general, in hieroglyphic texts relational nouns are often preceded by the general preposition *ta ~ *ti and take an ergative clitic or affix that normally marks possession (Law & Stuart 2017). Table (5.2) lists the relational nouns attested in Mayan hieroglyphic texts:

Contemporary Ch’olan languages attest more relational nouns that utilize body part vocabulary. Table (5.3) below compares the mereological and locative relational nouns that utilize body part terms in Ch’ol, Yokot’an (Chontal), and Ch’orti’ respectively:
<table>
<thead>
<tr>
<th>Ch'ol Locative Relational Noun</th>
<th>Meaning</th>
<th>Yoko't'an (Chontal) Locative Relational Noun</th>
<th>Meaning</th>
<th>Ch'ort'i' Locative Relational Noun</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td><em>u chejpa</em></td>
<td>'the side, next to, beside, together, close by; ribs'</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td><em>u cho'it</em></td>
<td>'base; butt'</td>
<td><em>u suy</em></td>
<td>'bottom or lower part, base; butt, anus, arse'</td>
</tr>
<tr>
<td><em>i jol</em></td>
<td>'top part; head'</td>
<td>-</td>
<td>-</td>
<td><em>u jor</em></td>
<td>'top part, surface, high point, above, on top of, over; head'</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td><em>u nàk</em></td>
<td>'center, at its half, between; belly'</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>i ñi' / ni'</em></td>
<td>'tip; nose'</td>
<td><em>u ni'</em></td>
<td>'point, corner; nose'</td>
<td><em>u ni'</em></td>
<td>'point, tip; nose'</td>
</tr>
<tr>
<td><em>y ok</em></td>
<td>'bottom part; foot/leg'</td>
<td>-</td>
<td>-</td>
<td><em>y ok</em></td>
<td>'base, foundation; foot/leg'</td>
</tr>
<tr>
<td><em>i pam</em></td>
<td>'top part, location above; forehead'</td>
<td><em>u pam</em></td>
<td>'top part, on top of, in front of; head'</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>i paty / pat</em></td>
<td>'back part, behind; back (of body)'</td>
<td><em>u pat</em></td>
<td>'behind, outside; back (of body)'</td>
<td><em>u pat</em></td>
<td>'back (of body), behind'</td>
</tr>
<tr>
<td><em>i tyi' / ti'</em></td>
<td>'entrance, edge; mouth'</td>
<td><em>u ti'</em></td>
<td>'side, edge, border, outline, entrance; mouth'</td>
<td><em>u ti'</em></td>
<td>'the edge, bank; mouth'</td>
</tr>
</tbody>
</table>

Ch'ol, Yokot'an (Chontal), and Ch'orti' all use *ni' ~ ni'* `nose` to indicate a `tip, point or corner`, *jol ~ jor* or *pam* `head` to indicate `the top of something` or `a location above something`, *paty ~ pat* `back (of the body)` to indicate a `location behind something` else, and *tyi' ~ ti'* `mouth` to indicate the `edge or entrance of something`. However, there is variability as well, with *'ok* `foot/leg` only used in Ch'ol and Ch'orti' to indicate `the bottom of something` and *cho'it* `butt` and *suy* `butt` to indicate `the bottom of something` in only Yokot'an (Chontal) and Ch'orti' respectively. Yokot'an (Chontal) also attests the use of *chejpa* `ribs` to indicate `the side of something` and *näk* `belly` to indicate the `center or middle of something` but is unattested in the other languages.

More specifically, in Ch'ol, Yokot'an (Chontal), and Ch'orti' relational nouns can indicate mereological relationships by indicating what part of an object something is. This can be due to the similarity in shape of the body part term used with the object part referred to or the similarity in location or orientation of the body part term used with the object part referred to. This is seen in example (5.1) from Ch'ol, where the use of *ni' ~ ni'* `nose` is based on a similarity of shape with the tip of a branch:

(5.1)

<table>
<thead>
<tr>
<th>ti'</th>
<th>i</th>
<th>ni'</th>
<th>te'</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td>3SG.ERG</td>
<td>nose</td>
<td>tree</td>
</tr>
</tbody>
</table>

`On the tip (top edge) / nose of the tree`

(Example from Aulie & Aulie 1978:103).

Branches have tips, or points like a nose, but do not necessarily orient forward as a human nose does. Yokot'an (Chontal) and Ch'orti' also attest this general meaning of *ni'* based on its shape.
The use of *tyi’ ~ ti’ ‘mouth’ is also based on its shape. In example (5.2) from Yokot’an (Chontal), *ti’ ‘mouth’ is used to indicate the opening of a cup:

(5.2)

<table>
<thead>
<tr>
<th>ix-pempem</th>
<th>ya’an</th>
<th>tā</th>
<th>ti’</th>
<th>tasa.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEM-butterfly</td>
<td>EXT</td>
<td>PREP</td>
<td>mouth</td>
<td>mug.</td>
</tr>
</tbody>
</table>

‘The butterfly is on the rim (mouth) of the mug’

(Example from Delgado Galvan 2013:72).

A mug has a clear edge or opening like the shape of a mouth, but it is not in the same orientation as a human mouth, which again faces forward. In contrast to examples (5.1-5.2), example (5.3) from Ch'orti' shows that *jol ~ jor ‘head’ and *pam ‘forehead, head’ are used based on their typical orientation or location:

(5.3)

<table>
<thead>
<tr>
<th>u</th>
<th>jor</th>
<th>e</th>
<th>otot</th>
</tr>
</thead>
<tbody>
<tr>
<td>3SG.ERG</td>
<td>head</td>
<td>DEF.ART</td>
<td>house</td>
</tr>
</tbody>
</table>

‘The house’s top/roof/head’

(Example from Hull 2005:58).

A roof of a house is not round like the shape of a head but occurs in the same orientation of a human head, being on top. Example (5.4) from Ch'ol shows uses of *paty ~ pat ‘back (of the body)’ is also based on its orientation:

(5.4)

<table>
<thead>
<tr>
<th>ti’</th>
<th>pat</th>
<th>k-otot</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td>back</td>
<td>1SG.ERG-house</td>
</tr>
</tbody>
</table>

‘at the back patio of my house / at my house’s back (part)’

(Example from Aulie & Aulie 1978:98, 166).
It is difficult to see how a human back is similar in shape to a patio, but a patio does orient away from the canonical interaction with a house at its front door, just like most human interactions occur facing another person, and not at a person’s back. Example (5.5) from Yokot'an (Chontal) shows *cho'it* ‘butt’ might also be based on its canonical orientation:

(5.5)

<table>
<thead>
<tr>
<th>ix-pempem</th>
<th>ya'an</th>
<th>tā</th>
<th>cho'it</th>
<th>tasa.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEM-butterfly</td>
<td>EXT</td>
<td>PREP</td>
<td>butt</td>
<td>mug</td>
</tr>
</tbody>
</table>

‘The butterfly is on the base (butt) of the mug’

(Example from Delgado Galvan 2013:72).

A mug’s base does not resemble a human butt but is where how the mug rests, like a human when sitting. Delgado Galvan (2013) notes though that a mug’s base is called as such even when the mug is turned upside down and thus that usages of this relational noun are based on the canonical position of use of the object referred to. Example (5.6a) from Ch'orti' shows a use of *'ok* ‘foot/leg’ that is based on its canonical orientation, while example (5.6b) from Ch'ol is ambiguous as to whether its use is based on its canonical shape or orientation, or both:

(5.6a)

<table>
<thead>
<tr>
<th>uy</th>
<th>ok</th>
<th>ny-o'tot</th>
</tr>
</thead>
<tbody>
<tr>
<td>3SG.ERG</td>
<td>foot/leg</td>
<td>1SG.ERG-house</td>
</tr>
</tbody>
</table>

‘My house’s foundation/foot’

(Example from Hull 2005:90).
A house’s square, flat foundation does not have much in common with the intricate slender shape of human legs and feet, but instead is the bottom part of a house, like human legs and feet when canonically oriented standing upright. Example (5.7) from Yokot'an (Chontal) shows *ch'epja* ‘ribs’ is used based on its canonical orientation:

(5.7)

| ni | yichu' | ya'an | 'u | ch'ejpá | 'otót |
| DET | dog | EXT | 3SG.ERG | ribs | house |

‘The dog is at the house’s side’

(Example from Montgomery-Anderson n.d.)

The side of a house is normally flat, and not curved nor having the intricate shape of ribs.

In Ch'ol, Yokot'an (Chontal), and Ch'orti' relational nouns can also indicate spatial relationships where the body part term specifies the ground where a figure is located. The figure can be touching the ground or in the general proximity of the ground. The variation of the uses of relational nouns thus shows a clear extension of meaning. Arguably, any of the examples presented above of mereological relationships could be used to express a ground when a figure is touching it. Commonly, the general preposition *tyi' / ti' ~ tā* is used to mark the following

---

36 Examples from Montgomery-Anderson (n.d.) may contain accents over the vowel to mark stress and should not be interpreted as tone.

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relational noun as a ground. Example (5.8), from (5.1) above, from Ch'ol, shows the use of *ni'~ni*  ‘nose’ as a location where the figure likely touches the ground:

(5.8)

<table>
<thead>
<tr>
<th>ti'</th>
<th>i</th>
<th>ni'</th>
<th>te'</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td>3SG.ERG</td>
<td>nose</td>
<td>tree</td>
</tr>
</tbody>
</table>

‘On the tip (top edge) / nose of the tree’

(Example from Aulie & Aulie 1978:103).

In example (5.8), the ground is *i ni' te'  ‘the tip/top edge/nose of the tree’ while the figure remains unexpressed. However, Aulie and Aulie’s (1978) translation suggests the figure is touching the ground. Moreover, the implied figure likely does touch the ground because if the figure was above the ground *jol ~ jor  ‘head’ or *pam ‘head, forehead’ would be used. Example (5.9a), from (5.2) above from Yokot'an (Chontal), shows *tyi'~ti'  ‘mouth’ can be used when the figure touches the ground. In contrast, example (5.9b) from Ch'ol shows *tyi'~ti'  ‘mouth’ can be used to reference an extended space, where the figure might simply be adjacent to the ground:

(5.9a)

<table>
<thead>
<tr>
<th>ix-pempem</th>
<th>ya'an</th>
<th>tä</th>
<th>ti'</th>
<th>tasa.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEM-butterfly</td>
<td>EXT</td>
<td>PREP</td>
<td>mouth</td>
<td>mug</td>
</tr>
</tbody>
</table>

‘The butterfly is on the rim (mouth) of the mug’

(Example from Delgado Galvan 2013:72).

(5.9b)

<table>
<thead>
<tr>
<th>tyi</th>
<th>i</th>
<th>tyi'</th>
<th>x-chejopa'</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td>3SG.ERG</td>
<td>mouth</td>
<td>NCL-Chejopa'</td>
</tr>
</tbody>
</table>

‘On the bank (edge) of Chejopa’

(Example from Vázquez-Álvarez 2011:147).
In example (5.9a), it is known that the figure *ix-pempem* ‘butterfly’ touches the ground *ti’ tasa* ‘the cup’s mouth/rim’ given the visual prompt Delgado Galvan (2013) used to elicit the example.

In example (5.9b), *tyi* ‘mouth’ is used to indicate an extended area of a riverbank as the ground, and not a clearly defined object, while the figure remains unexpressed. In example (5.10) from Ch’ol, *pam* ‘forehead’ is used to reference a figure adjacent to a ground:

(5.10)

<table>
<thead>
<tr>
<th>tyi</th>
<th>i</th>
<th>pam</th>
<th>silla</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td>3SG.ERG</td>
<td>forehead</td>
<td>SP:chair</td>
</tr>
</tbody>
</table>

‘In the location above the chair’

(Example from Vázquez-Álvarez 2011:147).

Vázquez-Álvarez’s (2011) translations suggest that ground is a spatial area above a chair, and not part of the chair itself, while the figure is implied. In example (5.11) from Ch’orti’, *pat* ‘back (of the body)’ is used to reference a figure that does not touch the ground:

(5.11)

<table>
<thead>
<tr>
<th>E</th>
<th>winik</th>
<th>namtz’i</th>
<th>x</th>
<th>t=u</th>
<th>pat</th>
<th>e</th>
<th>witzir.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DET</td>
<td>man</td>
<td>disappear</td>
<td>PREP=3SG.ERG</td>
<td>back</td>
<td>DET</td>
<td>mountain</td>
<td></td>
</tr>
</tbody>
</table>

‘The man disappears behind the mountain’

(Example from Hull 2005:86).

In example (5.11) the figure *winik* ‘man’ does not touch the ground *witzir* ‘mountain’ but simply disappears in a space behind it. Example (5.12) from example (5.7) above from Yokot’an (Chontal), shows *ch’epja* ‘ribs’ is used where the figure likely does not touch the ground:
In example (5.12), the figure yíchu’ ‘dog’ likely does not touch the ground ‘u ch'ejpá ’otót ‘the house’s rib/side’ but is in the proximity of the side of the house. The dog would have to be directly laying with its side touching the side of the house for the other interpretation to be represented.

### 3.2 Other Polysemous Vocabulary

Interestingly, relational nouns can be applied to label other parts of the human body and also to label parts of plants. Specifically, relational nouns are used to label smaller body parts within larger body parts that are not labeled by such compound or phrasal terms. Most commonly this includes words for parts of hands and feet, with Ch'olan languages labeling all of the hand and arm k'äb' ~ k'ab' and all of the foot and leg 'ok. Example (5.13a-b) shows Yokot'an (Chontal) uses ni’ ‘nose, tip, point, corner’ to label both fingers and toes:

(5.13a)

<table>
<thead>
<tr>
<th>ni'</th>
<th>k'äb'</th>
</tr>
</thead>
<tbody>
<tr>
<td>nose</td>
<td>arm/hand</td>
</tr>
</tbody>
</table>

‘fingers’

(Example from Montgomery-Anderson n.d.:53737).

---

37 Montgomery-Anderson (n.d.: 537-538) lists examples (13a-b) as unpossessed, as is done here.
(5.13b)

<table>
<thead>
<tr>
<th>ni'</th>
<th>'ok</th>
</tr>
</thead>
<tbody>
<tr>
<td>nose</td>
<td>foot</td>
</tr>
<tr>
<td>‘toes’</td>
<td></td>
</tr>
</tbody>
</table>

(Example from Montgomery-Anderson n.d.:538).

This use of *ni’ ‘nose, tip, point, corner’ clearly relies on the shape of fingers and toes being tips or points of hands and feet. Example (5.14a-b) shows Ch'orti' uses *jor ‘head, top part, surface, above, on top of, over’ to label both fingers and toes:

(5.14a)

<table>
<thead>
<tr>
<th>jor</th>
<th>k'ab'</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>arm/hand</td>
</tr>
<tr>
<td>‘fingers’</td>
<td></td>
</tr>
</tbody>
</table>

(Example from Hull 2005:57).

(5.14b)

<table>
<thead>
<tr>
<th>jor</th>
<th>ok</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>foot</td>
</tr>
<tr>
<td>‘toes’</td>
<td></td>
</tr>
</tbody>
</table>

(Example from Hull 2005:58).

This use of *jor ‘head, top part, surface, above, on top of, over’ clearly relies on orientation, with fingers and toes being the end, or top, part of hands and feet, respectively. Ch'ol does not use body part terms for fingers and toes, but uses these terms to label wrists and ankles, as seen in example (5.15a-b):
Both the use of bik' ‘neck’ and wut ‘eye’ relies on their canonical shapes, with a neck being a slender shape before a wider part like a wrist and an eye being round like an ankle joint.

Relational nouns can be used with plant terms. Example (5.16) from Ch'orti' shows u suy ‘it’s bottom, base, butt,’ can be used with a plant term:

(5.16)

Example (5.16) shows the use of suy ‘bottom part, base, buttocks’ to label the base of a sugar cane. Similarly, example (5.17) from Yokot'an (Chontal) shows pam ‘head, top part, above’ can be used to label corncobs:
Pam ‘head, top part, in front of, on top of’ is used to label corncobs, but specifically, the first harvested ones used for ritual offerings. This usage of pam is likely based on its canonical shape, and not its canonical orientation, as is true for most of its other usages. Corncobs can grow on the side of the plant, and not necessarily at its top. Example (5.18) from (5.1) above from Ch’ol, shows that ni’ ‘nose, tip, point, corner’ can also be used with plant terms:

(5.18)

<table>
<thead>
<tr>
<th>ti'</th>
<th>i</th>
<th>ni'</th>
<th>te'</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td>3SG.ERG</td>
<td>nose</td>
<td>tree</td>
</tr>
</tbody>
</table>

‘On the tip (top edge) / nose of the tree’

(Example from Aulie & Aulie 1978:103).

In example (5.18), ni’ ‘nose, tip, point, corner’ is used to indicate the top edge or tips of a tree, where its branches come to an end.

The relational noun pat ~ paty ‘back (of the body), back part, behind, outside’ also has a semantic sense of a ‘plant bark or a peel’ in all of the Ch’olan languages. The semantic sense of ‘back (of the body)’ is likely primary, given its attested semantic extension for mereological and locative constructions discussed above. Plant bark or a peel is something outside of an object, and the locative sense of pat ~ paty that was derived from its body part sense. Example (5.19) from Ch’orti’ shows a use of pat ~ paty ‘back (of the body), behind, outside’ to reference a peel:
In example (5.19), *pat ~ paty* ‘back (of the body), behind, outside’ is applied to a banana, to specifically label its peel.

*Jut ~ wut ~ ut* ‘face, eye, fruit’ is not a relational noun in Ch'olan languages but also exemplifies the semantic extension of human body parts to label plant parts. The semantic senses of ‘face’ and ‘eye’ are likely primary. Like with *k'ab’ ~ k’äb’* ‘hand/arm’ and *’ok* ‘foot/leg’ that each refer to a wider body part, it is likely that the general semantic sense of ‘face’ was specified to also mean ‘eye’. The semantic sense of ‘eye’ was then likely extended to have the semantic sense of ‘fruit’ given that other human body part terms were shown to be semantically extended based on their canonical shape. Example (5.20) from Yokot'an (Chontal) shows a use of *jut* ‘face, eye, fruit’:

(5.20)

<table>
<thead>
<tr>
<th>'u</th>
<th>jut</th>
<th>'u</th>
<th>k'aba</th>
<th>ch'ixil</th>
<th>koya</th>
</tr>
</thead>
<tbody>
<tr>
<td>3SG.ERG face/eye</td>
<td>3SG.ERG name</td>
<td>spine</td>
<td>tomato</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

‘Its fruit’s name is *chixil koya’

(Example from Montgomery-Anderson n.d.:304).

In example (5.20), *jut* ‘face, eye, fruit’ is used in reference to a specific kind of tomato.

*K'ab’ ~ k’äb’* ‘hand/arm’ is also not a relational noun in Ch'olan languages but can be used in Ch'ol and Yokot'an (Chontal) to label branches. The semantic sense of a human body part

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(Example from Hull 2005:93).
was again likely extended to the semantic sense of a tree part, given that these languages attest other words for ‘branch’ as well. Ch’ol attests *chopol* ‘thrown away, branch with leaves’ and *i-xäk* ‘it’s branch’ while Yokot’an (Chontal) attests *te’en* ‘branch’ and *te’el* ‘branch’. Example (5.21) from Ch’ol shows *k’äb’ ‘arm/hand’ being used to refer to a tree’s branch:

(5.21)

<table>
<thead>
<tr>
<th>Xäk’äl</th>
<th>i</th>
<th>k’äb</th>
<th>te’</th>
</tr>
</thead>
<tbody>
<tr>
<td>forked</td>
<td>3SG.ERG</td>
<td>arm/hand</td>
<td>tree</td>
</tr>
</tbody>
</table>

‘The branches of the tree are forked’

(Example from Aulie & Aulie 1978:112).

Interestingly, the word *xäk’äl* ‘forked’ has a related relational noun, *xäk*’ which means ‘branch’, but is used with *k’äb’ ‘arm/hand’ to reference the branch directly.

Finally, in Ch’ol *ak’~aq’ ‘tongue’ also has the semantic sense of ‘vine’. The semantic sense of ‘tongue’ is primary, given that the sense of ‘vine’ is not reconstructable in the other Ch’olan languages (Kaufman & Norman 1984). Example (5.22), from Ch’ol, shows a use of *ak’~aq’ ‘tongue/vine’:

(5.22)

<table>
<thead>
<tr>
<th>iy</th>
<th>äq’-uil</th>
</tr>
</thead>
<tbody>
<tr>
<td>3SG.ERG</td>
<td>tongue/vine-POSS</td>
</tr>
</tbody>
</table>

‘his/her/its vine’

(Example from Aulie & Aulie 1978:3).

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38 Yucatec attests the use of *àak’ as both ‘tongue’ and ‘vine’ but these are distinguished morphologically when possessed such as in *inw-àak’ ‘my tongue’ and *in àak’ ‘my vine’ Bricker et al (1986).

39 Examples (21) and (22) may suggest differences in metaphorically processing. The presence of the -Vl suffix in (22) is commonly used in inanimate possession. This suggests that it may be actively metaphorically processed, and not a dead metaphor. The domain of the HUMAN BODY is used as a source domain with the target of an INANIMATE OBJECT or shows a metaphor of personification.
The reading of vine above is based on Aulie and Aulie’s (1978) translation.

4 Visual Metaphors in Mayan Hieroglyphic Texts

This section will discuss in what ways the metaphor RULERS ARE TREES materializes in pictorial images. Section (4.1) presents examples of the visual metaphor and compares this to the polysemous body part and plant part vocabulary discussed in the previous section. Section (4.2) discusses examples of other related visual metaphors to justify this study’s label of the metaphor as RULERS ARE TREES.

4.1 Visual Metaphors of RULERS ARE TREES

As mentioned in chapter 3, this study manually examined nearly two thousand pictorial images (1960) to find examples of the RULERS ARE TREES metaphor. Of these images, this study found twenty instances of the metaphor, where an instance was defined as one human superimposed or fused with plant parts. These twenty instances only came from six texts, four of which were of vases of different styles, and two of which were on monumental architecture at Palenque. These examples show there is variability in what human body parts and plant parts are superimposed and fused, in addition to how this superimposition or fusion is accomplished. The first example shown in figure (5.5), is of a carved stone bowl from the northern Yucatán peninsula from the Early Classic period and depicts the maize god, or the impersonation of him by a ruler (K4331):
The maize god is identifiable in figure (5.5) by his sloping brow, tonsured hairstyle, and the jewels on his forehead (Martin 2006:154-156; Taube 1985). However, this example is included here because Mayan rulers are often depicted in a similar manner to the maize god, and the accompanying caption names a human impersonator of the god which is common in Mayan rituals (Martin 2006:154-156). In figure (5.5), cacao pods are fused with the limbs of the maize god, or an impersonation of him, in the two legible scenes. The maize god, or an impersonation of him, is also marked with the tree semantic classifier, making clear he is being depicted specifically as a cacao tree (Martin 2006:154-156). The text corroborates this reading, labeling the entity in the scene as ‘IXIM-TE’ ‘ixiim tee’ ‘maize tree’ (Martin 2006:154-156). Though puzzling at first glance, the connection between maize and cacao can be clarified. As discussed in chapter 2, maize was regarded as the most important agricultural crop with the maize god’s lifecycle allowing for the creation of other crops, such as cacao (Martin 2006:154-156).

The second example shown in figures (5.6-5.7), is of an incised vase with feet from the Petén, from the Early Classic period, showing scenes from a royal funeral (K6547):
In one part of the text the ruler’s body is bundled for burial, and in the second part, the ruler’s body is reduced to a skeleton (Martin 2006:156-158). Above the ruler’s skeleton are three people fused with trees, suggesting the ruler’s death is supportive of new life (Martin 2006:156-158). The people’s torsos are fused with the trunks of the trees at each tree’s lower half. Their heads are at the base of the tree as well but are not upside down, and instead are profiled with two of them facing each other. Their hands are positioned in the place where tree roots would normally occur. The leftmost tree is of some kind of spiked fruit, the central tree is of cacao, and the
rightmost tree simply has a vine growing around it (Martin 2006:156-158; Schele and Matthews 1998). The vase contains an example of the Primary Standard Sequence and names the owner of the vessel who is the central cacao tree, while the other trees might be his parents (Martin 2006:156-158). In another part of the vase, a metaphor for death discussed in chapter 4, <‘OCH-b'i-ji’ ooeh-b'iih-aj ‘he road entered’ is used in reference to the bundled and buried ruler (Martin 2006:156-158; Stuart 1998:387-389). However, <TE’ tee’ ‘tree’ nor derivations of it with the abstractive suffix are not mentioned anywhere in the text.

The third example shown in figure (5.8), is from an unprovenanced painted polychrome vase with feet, from the Late Classic period that depicts a supernatural palace scene (K631):

![Figure 5.8. Photograph of a polychrome vase, with a human (likely a ruler) fused with a cacao tree at its trunk, circled in green (Photo by Kerr (n.d.-b: K631); digital image courtesy of Justin Kerr).](image)

In the scene, the god K'awil is seated above people who are dressed in ballgame gear and someone who is grinding something on a metate (Martin 2006:169-170; Kerr n.d.-b). The god K'awil also interacts with god L of the underworld and gestures toward a cacao tree (Martin
In this scene, a person is again depicted as being fused with a cacao tree at his torso. However, the person’s torso rests on its side and is shown in profile at the base of the tree with his arms crossed, instead of having his arms located where tree roots might typically be. Standing, facing the person fused with a cacao tree, is someone with arms outstretched as if gesturing toward the cacao tree. The only text on the vase is of the Primary Standard Sequence but again does not mention <TE’> tee’ ‘tree’ nor derivations of it with the abstractive suffix.

The fourth example shown in figure (5.9), is of a painted polychrome vase without feet from the site of Nebaj, from the Late Classic period depicting a supernatural palace scene again (K5615):

![Figure 5.9. Photograph of a painted polychrome vase, showing the maize god (or possibly a ruler’s) head fused with a cacao tree in place of a cacao pod, circled in green (Photo by Kerr (n.d.-b: K5615); digital image courtesy of Justin Kerr).](image)

In figure (5.9), a ruler sits on a throne with tamales at its base while leaning towards a person and a bird below him in two different depictions. In between these two depictions of the ruler is a flowering cacao tree, with cacao pods stemming from its branches and a large flower at its base.
(Martin 2006:156-158). However, the head of what is likely the maize god is put in place of a cacao pod, as opposed to fusing a human or god’s torso with the trunk of the tree. This might be the maize god, because of the sloping brow, tonsured head, and jeweled headdress (Martin 2006:156-158). This scene may be similar to that in the K'iche' an Mayan creation story of the Popol Vuj where the maize god’s head was put in a calabash tree after his death, allowing the tree to have produce for the first time (Christenson 2007; Martin 2006:164-165; Mondloch & Carmack 2018; Tedlock 1996). However, given its context in a palace scene, and that rulers often impersonated gods, the head may be that of the owner of the vessel, as seen in the above examples. It is thus included here as an example of the metaphor rulers are trees. Finally, there is no Primary Standard Sequence text but simply a repetition of glyphs that may read <HIX-ji> hix ‘ocelot?/male jaguar?’.

The fifth example shown in figure (5.10), is from the carved sarcophagus of ruler K’inich Janab Pakal, from the Temple of the Inscriptions at the site of Palenque, in the Late Classic period, which depicts a funerary scene:

![Figure 5.10. Drawing of a carved sarcophagus, from the Temple of the Inscriptions, at Palenque, showing rulers superimposed on trees, growing from the ground, circled in green (Drawing by Linda Schele © David Schele (1986:p. 284 plate 111e); courtesy of Elaine & David Schele).](image-url)
In figure (5.10), three ancestors of the ruler K'inich Janab Pakal are superimposed with trees with their names listed in the text next to their sides (Robertson 1983). The other sides of the sarcophagus feature seven more images of his ancestors superimposed on trees (not shown here) (Robertson 1983). In contrast to the other examples above, the rulers are shown upright with their heads and shoulders superimposed on branches. Again, below their torsos are not depicted. Interestingly, they are shown growing out of holes in the ground, as indicated by the earth semantic classifier (Robertson 1983). Their hands are in various gestures, but none seem to take the shape or position of branches, or other parts of the tree. Based on their fruit, the trees might be that of cacao, guayaba, avocado, zapote, and nance, to name a few (Robertson 1983). On the top of the sarcophagus is an image of K'inich Janab Pakal laying in an offering bowl, in front of another tree (Robertson 1983; Ruz 1973), shown in figure (5.11):
Figure 5.11. Drawing of a carved sarcophagus, from the Temple of the Inscriptions, at Palenque, showing a ruler in a bowl in front of a tree, circled in green (Drawing by Linda Schele © David Schele (2000:SD-7619); photo courtesy of Ancient Americas at LACMA (ancientamericas.org)).

However, this tree is not produce-bearing and may be associated with cosmological conduits, which serve to transport the living and the dead through the cosmos at these respective stages of life (Robertson 1983; Ruz 1973). At the tree’s base are jaws which are similar to other portrayals of trees as cosmological conduits, discussed hereafter in section (4.2). K’ínich Janab Pakal’s sarcophagus is similar to the Early Classic funerary scene from vase K6547 shown in figures (5.6-5.7), where one ruler’s death is supportive of others’ transformations into trees (Schele & Freidel 1990).
The sixth example shown in figure (5.12), is of a carved panel in the back of the Temple of the Foliated Cross from the site of Palenque, from the Late Classic period, which depicts a scene with the ruler K’inich Kan Bahlam:

Figure 5.12. Drawing of a carved panel, from the Temple of the Foliated Cross, at Palenque, showing human heads (possibly of rulers) fused with a maize plant and on top of a shell with maize foliage, in place of corn cobs, circled in green (Drawing by Linda Schele © David Schele (2000:SD-172); photo courtesy of Ancient Americas at LACMA (ancientamericas.org)).

In figure (5.12), the ruler K'inich Kan Bahlam is depicted as a child and as an adult, presenting offerings in front of a maize plant (Tedlock 2010). This image is included here, given the maize plant’s treatment as a tree elsewhere and its similar metaphorical treatment to cacao. In figure (5.12), two human heads are shown in place of corn cobs, similar to the placement of a humanoid head in place of cacao pod in vase K5615 shown in figure (5.9). Interestingly, human hair seems to take the place and is of the same shape as maize foliage. At the maize plant’s base is a
personified mountain, from which it grows. Another image of a human head is seen with similar maize foliage on the bottom right of the image. The foliage is seen being brought out of a shell that acts as a conduit to the underworld, by the deity K'awil (Tedlock 2010). The text of the Temple of the Foliated Cross culminates the series of three temples which trace the genealogy of the ruler K'inich Kan Bahlam and the rituals he performs to become both an heir to the throne and finally the ruler of Palenque (Tedlock 2010). This series of texts attest the first examples of the use of the abstractive suffix with the metaphor RULERS ARE TREES, discussed in chapter 4.

Hieroglyphs are playfully inserted in the image here as well, blending the modalities of writing and pictorial images. Of note are uses of <la> syllabograms at the base of the maize plant, which are upside-down heads. A person depicted with their head upside-down in pictorial images also typically signifies a person is dead. Further, the near homophonous word laj means ‘end’ (Tedlock 2010).

These twenty instances, from six texts, show there is variability in what human body parts and plant parts are superimposed or fused and how this superimposition or fusion is accomplished for the metaphor. Table (5.4) summarizes this variability per text:
Table 5.4 shows instances of the visual metaphor come from both the Early Classic and Late Classic periods, though the Early Classic almost exclusively comes from carved or incised vases or bowls. Late Classic examples come from painted vases and carved monumental architecture, including a panel and a sarcophagus. The examples also come from a variety of regions. The only example of the superimposition of human body parts and plant parts comes from the Temple of the Inscriptions sarcophagus, while all other examples show human body parts fused with plant parts. Human limbs, torsos, and heads were the only body parts utilized in this superimposition or fusion. Most examples, except vase K4431, do not depict the entirety of
the human body. A variety of orientations are used, with the human being depicted upright with
the head at the top, the human head depicted at the base of the tree, or in the middle of the tree,
on a branch.

The visual metaphor does not necessarily express the visual relationships expressed by
polysemous plant or body part vocabulary attested in contemporary Ch'olan languages, given
there is considerable variability in how human body parts and plant parts are superimposed or
fused with each other. Since the relational nouns discussed here are not reconstructable to proto-
Ch'olan based on Kaufman and Norman (1984), and only some are attested in hieroglyphic texts,
contemporary forms are used in this assessment. Given the similarity in this vocabulary across
contemporary Ch'olan languages, it still provides good evidence for usages post Proto-Ch'olan.
Further, given the narrow genre of the hieroglyphic corpus, not all vocabulary used by speakers
would have been attested. The relational nouns jol ~ jor ‘head, top part, on top of, over, above,
surface’ and pam ‘head/forehead, top part, above, in front of, on top of’ suggest that the heads of
rulers should be placed near the top of the tree that it is superimposed or fused with, but the
examples above show that the ruler’s head can be placed near the top, bottom or side of the tree
it is superimposed or fused with. As noted above in section (3), only Yokot'an (Chontal) attests a
special use of pam ‘head’, based on its canonical shape and not orientation when applied to ‘ixim
‘maize’. In this use, pam ‘head’ specifically refers to corncobs first harvested for offerings. This
is seen in the Temple of the Foliated Cross in figure (5.12), where human heads are put in place
of corncobs. This use of pam ‘head’ does not explain the placement of a humanoid head in place
of a cacao pod in vase K5615 though. Martin (2006:165) suggests this visual depiction is based
on the polysemous word jut ~ wuty ~ ut ‘face, eye, fruit’. However, this study suggests that only
the semantic extension from ‘eye’ to ‘fruit’ is based on a similarity in shape, where both are
round. The semantic sense ‘eye’ is likely a specification of the semantic sense of ‘face’, with the sense of ‘face’ only being indirectly related to ‘fruit’. Section (4.2) will present examples where only a face is depicted on a tree trunk to justify this analysis.

The visual relationships expressed in other relational nouns are also not used. The relational nouns 'ok ‘foot/leg, bottom part’, suy ‘butt, bottom part’, and cho’it ‘butt, bottom part’ are not utilized because these body parts are not depicted in any of the examples, and only the sarcophagus at the Temple of the Inscriptions has a ruler in a position where their feet/legs and butt can even be imagined to be at the base of the tree. The relational noun ŋii~ni ‘nose, tip, point, corner’ can be used to refer to the tips of branches, as noted above, but rulers’ noses are depicted at the tips of branches either. The relational noun paty~pat ‘back (of the body), back part, behind, outside’ is also not clearly used, though it can be used with plant terms to have the sense of ‘bark, peel, shell’. The semantic extension of paty~pat ‘back (of the body), back part, behind, outside’ to have a semantic sense from the domain of plants is likely based on its semantic sense of being ‘outside’ of something and not the semantic sense of being in ‘back of or behind’ something. Applicable items that occur on the outside of an object or entity would include bark, peels, and shells which coat the entire outside of an object or entity. The semantic sense ‘of outside’ likely came from ‘behind’, which directly came from the sense ‘back (of the body)’. It is hard to imagine how bark or peel would be depicted on the rulers’ backs alone, especially when none of the rulers’ backs are clearly depicted as distinct from their torsos. The relational noun tyi’~ti’ ‘mouth, edge, outline, entrance, bank, side, border’ is also not used, but could possibly be, with ruler’s mouths superimposed or fused on the edge of the tree. This chapter demonstrates this possible usage through an example presented in section (4.2) below where the mouths of reptilian creatures are used for entrances of trees that act as cosmological
conduits. Finally, the use of $k'ub' \sim k'ab'$ ‘arm/hand’ to refer to a branch is also not used, even though it could be. Instead, the examples presented in this section show human hands may take the place of roots or not clearly orient with any plant part. Even on the sarcophagus from the Temple of the Inscriptions where the rulers are depicted upright, their arms are in various gestures, and not clearly outstretched to overlap or take the place of tree branches. Further, $*wii'$ ‘root’ is polysemous with the body part term ‘hair’ and is reconstructable to proto-Ch'olan and attested in Colonial Yucatec. Though this polysemous relationship exists, vase K6547 showed a different visual relationship with the use of hands and fingers in place of tree roots. The panel from the Temple of the Foliated Cross also attested a different visual relationship with human hair standing in for maize foliage, and not roots.

4.2 Other Related Visual Metaphors

Examples of the visual metaphor presented above clearly utilize the semantic domains of RULERS, GODS, TREES, and more generally PLANTS, making it necessary to justify the verbal label of RULERS ARE TREES and discuss related visual metaphors. As noted in the previous section (4.1), labeling the target domain is difficult because Mayan rulers ritually impersonated gods, but it is also clear that pre-Columbian Mayan deities are modeled on human life and human concerns. Specifically relevant to the examples presented in section (4.1), is the maize god who Mayan rulers are depicted similarly to with their tonsured hairstyles (Taube 1985). It is ambiguous whether rulers or the maize god are being depicted in some pictorial images if their names are not given by accompanying hieroglyphic texts. This study has chosen to label the source domain RULERS as opposed to GODS with ambiguous examples because pre-Columbian Mayan rulers are the subject of this study. The semantic domain of RULERS is also likely to be the
target domain because pre-Columbian Mayan rulers are usually the topics of Mayan hieroglyphic texts, given that they helped support a ruler’s political power, with the exception of the codices. As mentioned in chapter 3 the topic of a text is often the target domain of a metaphor (Strzalkowski et al 2013). A more thorough analysis of the depiction of Mayan deities might show the need to merge these semantic domains into one, with a single label. Regardless, a similar metaphoric treatment of RULERS and GODS merits an examination of both domains, as was done above in section (4.1).

An example of the maize god, possibly a ruler, might be related to the metaphor RULERS ARE TREES and help elucidate the metaphor’s semantic structure, discussed in the next section (5). Figure (5.13) is of a painted polychrome plate from the Late Classic period and depicts the maize god (K1892):

![Figure 5.13. Photograph of a painted polychrome plate, showing the maize god emerging from a turtle shell and having water poured over him, circled in green (Photo by Kerr (n.d.-b: K1892); digital image courtesy of Justin Kerr).](image-url)
Stone and Zender (2011: 23–24) contend that the vase in figure (5.13) has several visual
metaphors, though elements relevant to this chapter are only focused on here. In this scene, the
maize god emerges from a split in a turtle’s shell while two other people are by his side. One of
the people, directs the spout of a vessel toward the maize god, presumably pouring water on him.
Since a turtle symbolizes the surface of the earth, the scene may depict the maize god sprouting
from the earth after being watered, like an actual maize plant. However, the maize god only has
his normal tonsured hairstyle that resembles a maize plant’s foliage and does not show any
superimposition or fusion of his body parts with other maize plant parts, as was demonstrated in
the above section. This example thus focuses on depicting the lifecycle of maize and agricultural
cycles generally, as opposed to depictions of similar attributes between trees, plants, rulers, and
gods. Given that the maize god is supposed to be the embodiment of maize itself, its treatment
here might not be entirely metaphorical, because maize plants do indeed grow with the aid of
water. The example remains ambiguous though because the maize god is not depicted as a maize
plant, but his personified form.

However, another example of Mayan deities might suggest that deities are treated in a
metaphorically similar way to Mayan rulers in pictorial images. Figure (5.14) from the Dresden
Codex, from the Postclassic period, depicts two deities, Itzamnaj and Kimil, upside-down
(Förestmann 1932, p. 15; Vail & Hernández 2018):
In this scene, the two deities have leaves fused on their limbs. Kimil, the death god, on the right, has his leg fused with a branch and both of their arms are crossed. The depictions in figure (5.14) are unambiguously deities since the deeds of Mayan rulers are not depicted or described in the codices. These examples were thus not included in the above section (4.1). Additionally, the accompanying text differs from the examples presented in section (4.1) because the text connects these depictions explicitly with agricultural activities. In example (5.23), it states of the death god Kimil:

\[\begin{array}{cccc}
\text{\texttt{u-pa-k'a}} & \text{\texttt{k'u/K'UH-?-?}} & \text{\texttt{tze-ni}} & \text{\texttt{NAH?/na?-KIMIL-la}} \\
\text{u-p'ak-\texttt{∅}} & \text{\texttt{k'uuh}} & \text{\texttt{tzen?}} & \text{\texttt{naah Kimil}} \\
\text{3SG.ERG-to,plant-3SG.ABS} & \text{\texttt{holy}} & ? & \text{\texttt{house? Kimil}} \\
\end{array}\]

\texttt{‘Honored? Kimil plants tobacco food’}

(Codex Dresden - Ernst Förstemann (1892:15); transliteration courtesy of Vail & Hernández (2018)).
Vail and Hernández’s (2018) translation states that the death god Kimil is planting something, perhaps tobacco. Interestingly, this contrasts with the visual depiction in figure (5.14) which suggests Kimil is simply similar to some kind of plant. The linguistic metaphors discussed in the previous chapter describe rulers as being plants or as having plant attributes.

Labeling the target domain also has difficulties, briefly discussed above in section (4.1). Neither a label of TREES or PLANTS nor of specific kinds of trees and plants from these domains accounts for all of the variation seen with the visual metaphor. The visual metaphor utilizes mostly agricultural plants with produce-bearing trees and maize, though figures (5.6-5.7) of K6547 show an unspecified tree that does not have any produce with simply a vine wrapped around it. However, a general label of PLANTS, or specifically as AGRICULTURAL PLANTS, for the target domain is not sufficient because this study did not find examples of rulers depicted, say, as bean vines. Maize plants and trees might have been conceptually related because they are structurally similar, having a tall upright stalk or trunk with leaves and branches or stems coming off the top side of the plant which bears produce. Further in section (4.1) above, this study noted that maize had cosmological significance for agricultural trees, notably cacao, and might have been described as a tree. Section (4.1) also showed the use of the phrase <'IXIM-TE'> ‘ixiim tee’ ‘maize tree’ that suggests a similar conceptualization of maize and trees. A label of simply TREES for the target domain is thus used here. It is important to note though, that a specific label of AGRICULTURAL TREES accounts for most of the variation.

Other symbolic uses of trees include ‘world trees’ which demark cosmological space, as was discussed in chapter (2) (Knowlton & Vail 2010: 711–712; Miller & Taube 1993; Saturno 2006; Taube 1988; Thompson 1972). ‘World trees’ are often depicted in a quincunx consisting
of four sections corresponding to the cardinal directions and a center point which often have various birds perched on top of them (Miller & Taube 1993; Bassie-Sweet 2008; Knowlton & Vail 2010:711–712). ‘World trees’ were also regarded as cosmological conduits for communication and perhaps celestial travel (Bassie-Sweet 2008; Knowlton & Vail 2010:712; Taube 1993). The central tree of the quincunx has often been called *yaaxtee⁠’ blue/green tree* that often references the ceiba tree which is distinct from other trees through the thick thorns on its trunk (Knowlton & Vail 2010:712). Not all depictions of this tree are definitively identifiable as ceibas though, such as the ‘world tree’ depicted on Pakal’s sarcophagus shown in figure (5.11) above (Knowlton & Vail 2010:712). Most ‘world trees’ are not depicted with produce as is the case with trees used in the RULERS ARE TREES metaphor. However, it is possible that these two uses of trees might have blended together in rare cases, as Martin (2006:165-166) suggests.

Figure (5.15) from the Dresden codex of the Postclassic period depicts a ‘world tree’ that is presumably a ceiba tree, identified by the spikes drawn on its trunk:
In this scene, the ‘world tree’ acts as a conduit with the deity Chahk emerging from its top. At the bottom, the tree is fused with a reptilian mouth whose teeth take the place of the tree’s roots. Interestingly, in contrast to depictions of the visual metaphor *RULERS ARE TREES*, figure (5.15) does utilize visual relationships expressed by the relational noun *tyi’-ti’* ‘mouth, edge, border, outline, side, bank, entrance’. The reptilian mouth is presumably the entrance of this cosmological conduit.

Though a full examination of symbolic uses of ‘world trees’ is not done here, the example of the ruler Pakal’s sarcophagus shown in figure (5.11) above similarly suggests the ruler Pakal travels in the ‘world tree’, specifically after his death to another celestial realm. However, Pakal is not portrayed as having similar attributes to the ‘world tree’ in which he
travels, with no superimposition or fusion of human body parts and tree parts depicted in the pictorial image. Further, the tree is not depicted with any produce, like in figure (5.15).

Another example of a possible ‘world tree’ is seen on a painted codex style vase from the site of Nakbe, from the Late Classic period, shown in figure (5.16) (K1226):

![Figure 5.16](image)

This scene depicts one of the sons of the maize god shooting a bird out of a tree with a blowgun (Coe 1989). That this is a ‘world tree’ is suggested by the bird perched on the tree’s top. Again, the tree is depicted without produce. A partial depiction of a face is superimposed on the trunk of the tree at its base, with eyes, a nose, and possibly ears, visible. It is unclear if this is a human face, or not, but ‘world trees’ often have some kind of face or head at their bases (Knowlton & Vail 2010). Some of these uses are linked to depictions of these trees as conduits, and are clearly reptilian in nature, whereas others are less clear.

Another example of a ‘world tree’ is depicted on a painted polychrome vase, possibly from Naranjo, from the Late Classic period, shown in figure (5.17) (K1288):
This scene depicts a ballgame with a tree to the right, surrounded by birds, and with a bird perched on its top. Again, the bird perched on its top suggests it is a ‘world tree’ and it is depicted without produce. A face is superimposed in the middle of the tree’s trunk, with a clear human nose, a mouth, and an eye, shown in profile. This is slightly different than ‘world trees’ who have faces or heads depicted at their bases.

Figures (5.16-5.17) seem to make distinctions between ‘world trees’ that involve the superimposition or fusion of human body parts and plant parts ambiguous with the metaphor RULERS ARE TREES. However, examples of the RULERS ARE TREES metaphor shown in section (4.1) always depicts the human head in full and fused to the tree, and not superimposed. One’s head is a key identifying feature of a human being, suggesting that HUMANS, or RULERS, or DEITIES, are the topic or subject of the depiction and the target domain. In contrast, the trees dominate their depiction in figures (5.16) and (5.17), with superimposed faces blending into the tree’s trunk. This suggests ‘world trees’ are personified or at least animate, having the opposite target domain of TREES and using the semantic domains of HUMANS or ANIMATE ENTITIES as the
source domain. The label for the metaphor for ‘world trees’ would then be WORLD TREES ARE ANIMATE ENTITIES, or WORLD TREES ARE HUMANS if a given depiction of a world tree has clearly human attributes. This analysis affirms and is supported by Indurkhya and Ojha (2017) who suggest that visual metaphors still have an asymmetrical structure despite not having a linear order, as is true with linguistic metaphors. If the source and target domains are reversed, then, a substantial change in what semantic properties are shared between semantic domains changes – as seen in the comparison of the two types of metaphorical uses of trees discussed here. The difference between the depiction of ‘world trees’ and the RULERS ARE TREES metaphor is also affirmed and supported by work by Tversky (1977) and Ortony (1979), who propose a model for what semantic material is shared between the source and target domain. Tversky (1977) and Ortony (1979) both contend that the most salient properties of a source domain are preserved and transferred to less salient properties of a target domain. In the metaphor RULERS ARE TREES a high salient feature of the target domain RULERS, the human head, is always preserved and depicted, whereas low salient features of the target domain RULERS such as human feet are not necessarily preserved or depicted. In their place, tree parts are depicted, suggesting the transference of highly semantic features of the domain of TREES to low salient features of the target domain of RULERS. For ‘world trees’ most of the target domain of TREES is preserved and depicted, with facial features merely superimposed and blended into the trunk of the tree.

5 The Semantic Shape of Metaphor: Variation and Semantic Structure in Pictorial Images

That the visual expression of the metaphor RULERS ARE TREES materializes through the superimposition or fusion of human body parts and plant parts is partly due to the communicative affordances of the visual modality. The communicative affordances of the visual
modality are different than the modality of writing, where the expression of the metaphor may not be fully elaborated by merely alluding to the source and target domain or a few of the similar attributes between rulers and trees. The visual modality makes it necessary that the metaphor is depicted compositionally, and thus more elaborately. The visual modality requires that the metaphor depicts in precisely what way a ruler is similar to a tree, where each physical attribute of a ruler and a tree must be mapped to each other or explicitly remain unexpressed.

Despite these affordances, the visual metaphor may express other semantic structures beyond similarities in attributes between entities. The visual metaphor may statically depict different processes, where different stages of the lifecycle of a tree are used to depict different stages of the lifecycle of a ruler. Lakoff and Johnson (1980) note we frequently reify processes as entities, which they label as *ontological metaphors*. For example, pre-Columbian Mesoamerican art frequently depicts the deceased in an upside-down position, which might be applicable to figures (5.6), (5.7), and (5.8) where rulers were depicted as being fused with the base of the tree. Figures (5.6), (5.7), and (5.8) may thus emphasize the life stage of human death. In contrast, figure (5.10) may emphasize the life stage of human birth, where the rulers were depicted upright and growing from the ground. Figures (5.9) and (5.12) might emphasize that the human reproductive cycle is regenerative, where one person sustains or gives life to another, as food does. In figures (5.9) and (5.12), rulers’ heads are depicted in place of produce. That processes, over attributes, are being depicted, seems plausible given that figure (5.12) attempts to explicitly mark the rulers as coming out of, and thus growing from the ground. Further, figure (5.13) explicitly depicts the process of the maize god’s rebirth from the underworld as involving that which supports plant growth – water. Again, gods and rulers are conceptualized in similar, though not necessarily
identical, ways in Mayan hieroglyphic texts. An attempt to depict these different life stages also explains some of the variations of the visual metaphor.

The variation of the depiction of the visual metaphor might also be due to another aspect of its semantic structure. There might be two different models of the metaphor with different metaphorical entailments. Metaphorical entailments are the semantic structure that is transferred from the source to the target domain. First, a lineage of rulers might be conceptualized as a collection of trees, such as in an orchard, where each ruler is conceptualized as an individual tree, as noted by Schele and Freidel (1990) and discussed in chapter 4. Second, a lineage of rulers might be conceptualized as a single tree, where each ruler is merely a part of an individual tree, as suggested in figures (5.9) and (5.12) where rulers’ heads were depicted in place of a tree’s produce. This variation thus suggests that metaphorical entailments are not necessarily predetermined or standardized across a culture or society, counter much research in Conceptual Metaphor Theory.

How the visual metaphor was depicted was also not determined by the visual relationships expressed by polysemous vocabulary. In particular, relational nouns may express visual relationships in the form of image schemas. Image schemas are broad visual relationships or visual properties, that apply across situations, such as orientation or shape, as opposed to being an image of a complete object (Lakoff & Turner 1989). However, neither the properties of shape nor orientation seemed to be determinant of what body parts and plant parts were superimposed or fused for visual metaphor. For example, the relational noun jol~jor ‘head’ seems to mark orientational relationships, marking the top parts of or locations above objects. However, the heads of rulers could be depicted at different locations of the tree in expressions of the visual metaphor. Relational nouns based on the shape of a human body part, such as tyi’~
ti₄⁰⁰ ‘mouth’ that was shown to mark the opening or edge of objects and places, was also not used in expressions of the visual metaphor. Use of this relational noun in visual metaphors was possible though, as shown in figure (5.15) where non-human reptilian mouths mark the entrance to cosmological conduits, which may be trees. It was also insignificant if the polysemous body part vocabulary could be used with plant terminology or was polysemous with plant terms themselves for their usage in the visual metaphor. The only exception to this was found in Yokot'an (Chontal), which utilized pam ‘head’ with 'ixim ‘corn’ to mean ‘the first corn cobs harvested used for offerings’. This usage is only attested in Yokot'an (Chontal) and is seemingly based on shape and not orientation like other usages of terms for ‘head’. It thus seems that this semantic sense was derived much later in time, perhaps being a product of the already existing metaphor as opposed to influencing visual depictions of the metaphor.

That the visual metaphor does not necessarily depict the visual relationships expressed by polysemous vocabulary is resultant from the metaphor prioritizing depicting its immediate semantic structure over image schemas generally existing in a language. Additionally, these results may be partly explained by, and uphold, the principle that there is an asymmetry in visual metaphor despite not having a linear order, as in language and writing. The asymmetry of metaphors was demonstrated as a property of visual metaphors in section (4.2). In the case of polysemous body part vocabulary, the HUMAN BODY is the source domain that is applied to the target domain of OBJECTS, including PLANTS, and SPACE. In contrast, the RULERS ARE TREES metaphor reverses these general domains for its source and target. The domain of RULERS, or HUMANS more broadly, is the target domain, and the domain of TREES, or PLANTS more broadly, is the source domain. Further, the lack of use of some polysemous body part vocabulary, such as

40 Again, relational nouns and other polysemous body part vocabulary are cited in their contemporary Ch'olan forms.
'ok ‘foot’ might be explained because they were not salient properties of the domain of RULERS, or HUMANS more broadly. Thus, elements of the domain of TREES would be mapped to these properties and be depicted in their place, as discussed in section (4.2).

6 Conclusion

In conclusion, the metaphor RULERS ARE TREES materializes substantially differently in pictorial images in Mayan hieroglyphic texts than it does in writing, or language broadly, due to the communicative affordances of the modality and the semantic structure of the metaphor. The communicative affordances of the visual modality necessitate a compositional, elaborate metaphorical structure, in contrast to how the metaphor materializes in writing, which may not be fully elaborated. The metaphor materializes through the superimposition or fusion of human body parts with tree parts, though precisely what human body parts and tree parts were used in the metaphor was variable. However, the visual metaphor may not merely express what are the shared attributes between rulers and trees but, similar processes in the lifecycle of a ruler and that of a tree. Depicting processes in static images may necessitate variation, capturing different moments of a ruler’s and tree’s lives. Variation of the visual metaphor is also due to another element of the metaphor’s semantic structure. There are two models of the metaphor or sets of metaphorical entailments. One model depicts a lineage of rulers as an orchard and each ruler as a single tree. The other model depicts a lineage of rulers as a single tree, with each ruler corresponding to a tree part. The visual metaphor showed that it did not necessarily match the visual relationships, or image schemas, expressed by polysemous body part and plant part vocabulary in Ch'olan languages at large. This vocabulary has long been cited by Mayan epigraphers as being represented in Mayan pictorial images, noting the intimate relationship
between writing and pictorial images in Mayan hieroglyphic texts. Instead, the variation of the visual metaphor can be explained again by its semantic structure. The variation of the visual metaphor can be explained by and seems to uphold the principle of metaphorical asymmetry and that the salience of certain properties in semantic domains plays a role in the depiction of visual metaphors.
Chapter 6 – Shifting Meanings of Mayan Hieroglyphic Vases: Metaphor across Modalities and Media in Changing Political Climates

1 Introduction

The previous two chapters asked what the linguistic and visual shape of metaphor is and ultimately argued that metaphor materializes distinctly in the modalities of writing and pictorial images. Specifically, it was shown that in writing metaphor can materialize through the use of unique grammatical forms, while in pictorial images metaphor can materialize through the superimposition and fusion of distinct images. It was also noted that when in writing, the metaphor rulers are trees is only found on monumental architecture at a few sites with the earliest example from the site of Palenque. When in pictorial images, the metaphor is found on monumental architecture at Palenque but, predominantly on vases. It was also noted in chapter 2, that Mayan hieroglyphic texts exhibit complex multimodality, where the relationship between writing and pictorial images is not always distinct. This chapter thus focuses on understanding this variation and the relationship between modality and media in the materialization of metaphor, specifically, how metaphor materializes across these modalities, media, space, and time. More directly, this study addresses why and how Palenque came to use the metaphor rulers are trees in such a unique way compared to other earlier cases of the metaphor in the Classic Mayan period. This study also leaves later examples of the metaphor at other sites undiscussed because they are beyond the scope of this study and it is likely Palenque influenced these later examples.

To examine this variation, this chapter provides an analysis of Mayan vases in more depth given that these vases show numerous examples of visual metaphors and what at least
appear to be literal uses of vocabulary that are used metaphorically at Palenque. These literal uses occur in standardized writing on many Mayan vases, known as the Primary Standard Sequence (PSS). To analyze these seemingly literal uses, this chapter uses common corpus linguistic statistics that measure the degree of association of a word’s general usages and meanings. Specifically, this chapter examines tee’eel ‘orchard’ and ch’ok ‘unripe, youth, heir’ which were found to be used metaphorically at Palenque. This chapter also considers the social, historical, and discursive context of use that encouraged these literal meanings’ reinterpretation as they traveled to new media, modalities, and places. To do this, this chapter provides a Bakhtinian discourse analysis as outlined in Wortham and Reyes (2015) of several examples of the PSS that use the word tee’eel ‘orchard’. This approach to discourse analysis showcases how specific discursive and social contexts encourage the creation of meaning as it changes across different texts, places, and times. This multimodal discourse analysis includes an analysis to account for the uses of the metaphor in pictorial images.

This chapter demonstrates that uses of tee’eel ‘orchard’ are associated with ch’ok ‘unripe, youth, heir’ in the PSS but fail to directly modify ch’ok ‘unripe, youth, heir’, as is true at Palenque, and are thus not definitively being used metaphorically. This chapter also demonstrates that tee’eel ‘orchard’ was slowly being recontextualized to be used metaphorically at Palenque to have a sense of ‘lineage’ through several examples from the PSS and in light of pictorial depictions of the metaphor on vases. Given that none of the pictorial depictions of the metaphor on vases mention tee’eel ‘orchard’ in accompanying writing and not all of these vases

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41 As noted in chapter (4), tee’eel will be translated with only its semantic sense of ‘orchard’ when referencing its general uses in the PSS. This is because this chapter aims to demonstrate how the semantic sense of ‘orchard’ was metaphorically extended to have the sense of ‘lineage’. It would not elucidate the argument of this chapter if both senses of ‘orchard, lineage’ were listed in these contexts. Both senses are listed when a given example or context is argued to attest both.
even exhibit the PSS, this chapter argues this recontextualization was ultimately due to the socio-historic context of use of these vases. This context encouraged Palenque to reinterpret the presumably literal language in the PSS on certain vases in light of pictorial images on others. Specifically, these vases were used as part of ritual gift exchanges in feasting events that solidified relationships between different polities and validated political lineages at the end of the Late Classic period. During this time, new political relationships were emerging with the growth of smaller polities, like Palenque, which increased political competition and shifted regional power networks. Metaphors were used to validate political lineages in the face of this competition and particularly, at Palenque, in new contexts of monumental architecture that formally decreed who had political power.

Further, the linguistic context of the PSS allowed for tee’eel ‘orchard’ to become metonymic for the socio-historic context of use of these vases, which was reinterpreted metaphorically at Palenque. Chapter 3 noted that metonymies use a single part of a conceptual domain to represent it in its entirety and that metonymies are often the basis of the creation of new metaphors. A discursive tradition of visual and verbal parallelism and graphic convergence of routinely co-occurring signs, where visual and verbal forms are partially copied or converge, also provided an impetus for this cross-modal and cross-medium semantic shift. The metaphor shift at Palenque was also part of general linguistic change of the register of Palenque at this time.

Section (2) elaborates the corpus linguistic and discourse analysis techniques used in this chapter. Section (3) provides an overview of the uses and forms of Mayan vases, focusing on standardized writing on some of these vases, known as the Primary Standard Sequence (PSS). Section (4) provides a corpus linguistic analysis of the PSS, specifically examining tee’eel
‘orchard’ and *ch’ok* ‘unripe, youth, heir’. Section (5) explains precisely how the metaphor *RULERS ARE TREES* was created and shifted as it traveled across modalities and media using a Bakhtinian style of discourse analysis as outlined in Wortham and Reyes (2015). Section (6) provides a summary and conclusion.

2 Tracing Multimodal Metaphors Across Texts, Media, Space, and Time

This study has argued for using a mixed-methodology approach and exemplified this approach in chapters 4 and 5, which utilized corpus linguistic techniques and discourse analysis. In chapter 4, this method was carried out in searching for linguistic metaphors, where the discursive context helped inform corpus searches. Examining the discursive context was possible due to a previous discourse analysis but, at a basic level involved a manual examination of texts. In chapter 5, though working with pictorial images, this mixed-methodology was carried out through a manual examination of not a few texts or discursive contexts but, a large body of pictorial images. In these chapters, the focus was on identifying metaphors in various texts and pictorial images. Here, mixed-methods are applied to trace how metaphors travel and change across modalities, media, texts, space, and time.

Tracing metaphors in this way begins with using the results of metaphor identification and analysis in individual texts and pictorial images, specifically noting the variation of metaphor in different modalities, media, texts, and space. To note, the rare linguistic examples of the *RULERS ARE TREES* metaphor is first found at Palenque on monumental architecture, and the visual metaphor is on monumental architecture from Palenque and vases with other provenances. It thus makes sense to further examine why the linguistic metaphor is absent on vases, as this
holds a clue to understanding how the metaphor traveled to the new modality of language and writing and the media of monumental architecture at Palenque.

To do this, an examination of the writing of vases must be done. It was previously noted that vocabulary used metaphorically at Palenque may have be used literally on vases in the PSS. This vocabulary includes *tee'eel* ‘orchard’ and *ch'ok* ‘unripe, youth, heir’ and is focused on here. In contrast to chapter 4, this chapter runs common corpus linguistic statistics specifically designed to measure the degree and nature of words’ associations with other words. While this was not possible in chapter 4 and was not necessary for the aims of that chapter, it is possible here by using the updated version (2019) of Mora-Marín’s (2004b) *Primary Standard Sequence Database* given to the author. The database consisted of 860 vases and other portable objects with the PSS and any related secondary texts. This database could be modified to be run on the corpus linguistic software package #LancsBox developed at Lancaster University (Brezina, Weill-Tessier, & McEnery 2020) that runs and gives reports of common statistics used in corpus linguistics.

This study eliminated some kinds of examples to ensure the data across each section of this study amounts to a balanced and representative sample, as much as possible. Specifically, this study only examines vessels, vases, and other portable objects from the Classic period (200-900 A.D.) and Postclassic period since this study’s other results did not include examples from the Preclassic. This study thus eliminated examples from an updated (2020) version of Mora-Marín’s (2004b) database that were from the Late Preclassic period (300 B.C.- 200 A.D.) and those from the monumental architecture, which had the consequence of eliminating the only example from the Postclassic (900 A.D. – 1697 A.D.). Examples from monumental architecture and the codices were also covered more fully in the previous chapters. Monumental architecture
included stelae, panels, tablets, murals, lintels, columns, stairways and steps, thrones and benches, a ballcourt hoop, capstones, and a brick. Portable objects included vases, bowls, plates, bottles, flasks, boxes, lids, pendants, earrings/ear flares/ear spools, gorgets, masks, yokes, pectorals, mirrors, needles, maces, celts, dance batons, trumpets, rattles, effigies, figurines, bones, shells, stingray spines, stones, spheres, and cylinders. None of the examples this study eliminated contained tee’eel ‘orchard’, so any similarity of the PSS in the Late Preclassic (300 B.C. – 200 A.D.), the Postclassic (900 A.D. - 1697 A.D.), or on monumental architecture was not due to the mentioning of tee’eel ‘orchard’. Only two eliminated examples from monumental architecture mentioned ch’ok ‘unripe, youth, heir’. This does not affect the results here because ch’ok ‘unripe, youth, heir’ was already discussed in chapter 4 in the context of monumental architecture. Table (6.1) gives basic information about the modified version of Mora-Marín’s (2004b) *Primary Standard Sequence Database* as updated in 2019, used in this chapter:

<table>
<thead>
<tr>
<th>Name</th>
<th>Texts</th>
<th>Tokens</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mora-Marín’s (2004b) <em>Primary Standard Sequence Database</em> - Updated (2019) and Modified</td>
<td>801</td>
<td>8,318</td>
<td>Types: 3,256 Lemmas: NA</td>
</tr>
</tbody>
</table>

Table 6.1. Corpus used consisted of a total size of 8,318 running tokens in terms of glyph blocks in 801 texts (vases and other portable objects) for the Classic Period.

For consistency with the *Maya Hieroglyphic Database Project* (Macri & Looper 1990-present), all scores are analyzed in terms of glyph blocks which normally consist of one to three words. A much bigger project needs to be undertaken to transcribe all glyphic spellings into individual words and to code each word for lemmas, as is standardly done in corpus linguistics. However, results using glyph blocks are still useful because they can show patterns in glyphic
spellings, allowing new interpretations for translations to be made that may help a later transcription of glyph blocks into words and lemmas.

Words’ associations with other words can occur for a variety of reasons such as the grammar of a language but also due to the social meaning of words beyond their dictionary senses. Words’ meanings are always rooted in linguistic conventions based on social contexts of use that make some pairings more felicitous than others. This phenomenon is called semantic preference or semantic prosody by corpus linguists (Sinclair 1996). Corpus linguistic statistical measures of words’ associations do not tell us precisely why there is such an association between words, or what the social context and meaning driving the association is. A discursive examination of the linguistic context is thus needed to fully understand the association of words. This is traditionally done through examining concordance lines that provide a minimal linguistic context, typically a ten-word span on either side of the word in question. This is not enough to study words’ associations though. To paint a richer picture of the discursive context driving words’ associations, an analysis of the discursive context across different contexts is done. Specifically, this study used a Bakhtinian style of discourse analysis as outlined by Wortham and Reyes (2015). This approach traces how the social and discursive context allows for words’ associations and meanings to become solidified or change as they travel to different texts across, space and time and amongst different speech act participants.

3 The Primary Standard Sequence (PSS) and Context of Use of Mayan Vases

Mayan hieroglyphic vases are interesting when compared to other hieroglyphic media because the pictorial images on vases were not necessarily directly related to the writing on them and could be abstract or represent supernatural scenes in addition to mundane, everyday scenes.
As elaborated in this chapter, writing and images on vases could circulate separately to other vases and even other media, allowing new meanings to emerge as they traveled.

Many scholars have contributed to understanding the structure of the writing on these vases including work by Coe (1973, 1978, 1982), Mathews (1979), Justeson (1983), Stuart (1984, 1986, 1987, 1988, 1989, 2005), Schele and Stuart (1985), Houston and Taube (1987), Houston, Stuart, Taube (1989), Krochock (1989, 1991), Grube (1990, 1991), MacLeod (1990), Reents-Budet (1994), Boot (2002, 2003, 2004, 2005a, 2005b, 2005c, 2009, 2010) and Mora-Marín (1999a, 1999b, 2000, 2001, 2004b). These scholars have noted that Mayan hieroglyphic vases, like many portable objects that bear Mayan hieroglyphic texts, are tagged with the owner’s name and a possessed noun naming the object itself. However, Mora-Marín (2020c) has noted that some of these ‘name-tagging’ phrases may exhibit dative possession where it is specified that the possessed object was made for someone, thus suggesting these vessels were recording their use in ritual gift exchange. Portable objects with such texts not only include different kinds of ceramics, but also jewelry, bones, shells, figurines, and others. Many of the texts on these objects, however, can be more elaborate and are viewed to have some degree of standardization across the objects that bear them.

Labels for these texts have included the Primary Standard Sequence (PSS) (Coe 1973) and the Dedicatory Formula (Mora-Marín 1999b, 2001; Stuart 2005). Mora-Marín (1999b, 2001) and Stuart (2005) have advocated for labeling these texts as the ‘Dedicatory Formula’ because they argue that this is what many of these texts were intended to do - dedicate these objects or elements of them to their owners. Mora-Marín (2004b) argues that for vessels specifically, that their pictorial images, the foodstuffs they were claimed to have held, and the owners themselves could all be dedicated. However, Mora-Marín (2020c) now advocates for using the label of the
Primary Standard Sequence (PSS) by Coe (1973) as a more general and neutral label to account for cases where there is no clear dedication predicate. Further, Justeson (2021 personal communication) has noted that although some common predicates have been translated as meaning ‘to dedicate’ no Mesoamerican language attests an indigenous word with a meaning of ‘to dedicate’, suggesting this is not the right characterization of these texts’ functions. Thus, as noted in chapter 2, the Primary Standard Sequence (PSS) label is used in this study. Although the social context of use may suggest that these objects were dedicated, even if not explicitly stated, the term *commemorate* will be used instead. *Commemorate* ‘to mark by ceremony, to serve as a memorial’ has a wider meaning than *dedicate* ‘to inscribe or address by way of compliment’. This wider meaning thus covers a wider range of the possible social functions of the Primary Standard Sequence (PSS), though the author leaves open the best way to describe these social functions to future research.

The Primary Standard Sequence (PSS) as discussed here did not take shape until well into the Early Classic period around 450 A.D. (Reents-Budet 1994), though Mora-Marín (2004b) argues elements of the Primary Standard Sequence (PSS) are found earlier on Late Preclassic (300 B.C. – 200 A.D.) jade artifacts and on some monumental architecture. The name-tagging, gifting, and commemoration of objects found in the Primary Standard Sequence (PSS) may be part of an older tradition than narrative texts found later at Mayan sites (Stuart 2005). Mora-Marín (2004b) identifies thirteen main variations of the Primary Standard Sequence (PSS) on vessels which could include a variety of elements. These elements include listing the type of vessel, whether it was carved or painted, the vessel’s owner and/or elaboration of their name and titles, the vessel’s proclaimed foodstuffs contents, dedication predicates, labels of the pictorial images, or writing on the vessel itself, or even speech. Stuart (2005) notes that the Primary
Standard Sequence (PSS) also sometimes includes dates, linking them firmly to historical events. Some of these types of vessels included *ulak*⁴², *ujawante*⁴⁴ ‘his/her/its plate’, *uwe’ib* ‘his/her/its footed plate’, *ujawante*⁴⁴ ‘his/her/its eating thing, his/her/its plate’, *yuk’ib* ‘his/her/its cup’, *ujaay* ‘his/her/its bowl’, and *ujaay yuk’ib* ‘his/her/its cup, his/her/its bowl’ (Boot 2002, 2003, 2004, 2005a, 2005b, 2005c, 2009, 2010; Houston, Stuart, & Taube 1989; Kettunen & Helmke 2020; Stuart 2005). Foodstuff contents that are labeled on the vessels mostly reference maize or cacao drinks (Loughmiller-Cardinal 2019). The meaning of the foodstuff variants is far from agreed upon or understood (Stuart 2005; Loughmiller-Cardinal 2019).

A study by Loughmiller-Cardinal (2019) argues that cylindrical vessels labeled as *yuk’ib* ‘his/her/its cup’ with the Primary Standard Sequence (PSS) were not actually used for consumption, and at most were used to store cacao beans. Loughmiller-Cardinal (2019) found no chemical residue of cacao, or other foodstuffs, like maize, chili peppers, psilocybin mushrooms, and buffo toxin, though cacao residue has been found on other types of vessels. These cylindrical vessels also did not show useware of cacao beverages, such as staining from a liquid rim but did show some abrasive marks from perhaps removing cacao beans (Loughmiller-Cardinal 2019). The cylindrical vessels were much too thin and porous to contain a liquid for more than a few minutes without damaging external decoration and much too large and heavy to drink from, weighing over four pounds when filled with a liter of a cacao beverage (Loughmiller-Cardinal 2019).

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⁴² The pronominal clitics *a* = and *u* = will be transcribed in their phonemic forms, without an initial glottal stop, for consistency. To note, when they occur utterance initial, they phonetically have an initial glottal stop.

⁴³ Vessel types are translated based on their physical characteristics unless a vessel type’s etymology has been firmly established. For more discussion of their etymologies see the following sources: Boot 2002, 2003, 2004, 2005a, 2005b, 2005c, 2009, 2010; Houston, Stuart, & Taube 1989; Kettunen & Helmke 2020; Stuart 2005.

⁴⁴ The vessel type labeled *ujawante* is identical to the *ulak* vessel type except for its tripod support (Kettunen & Helmke 2020:34). Stephen Houston first identified the vessel type with the term *hawante* in Colonial Yucatec (MacLeod 1990: 300-303). This term may consist of the root *jaw* ‘face up’ and the participle -an (Kettunen & Helmke 2020:34; MacCleod 1990; Mora-Marín 2021 personal communication).

⁴⁵ The root *jay* ‘thin’ is found in Yucatec but it is unclear if this is the root being used to label vessels (MacCleod 1990:363).
Pictorial images of elites drinking show them using smaller, undecorated cylinder vessels or bowls (Loughmiller-Cardinal 2019). Vessels that have been found with cacao residue have not contained such pictorial images and only sometimes have written text (Loughmiller-Cardinal 2019).

Instead, Loughmiller-Cardinal (2019) argues cylindrical vessels with the Primary Standard Sequence (PSS) were merely part of political and religious rituals that involved ritual feasting and gift exchange. Pictorial images on cylindrical vessels with the Primary Standard Sequence (PSS) often portray scenes where accouterments of political power were presented to rulers, such as the cylindrical vessels themselves, or other important historical or mythological scenes (Loughmiller-Cardinal 2019). The use of these vases may have also involved the ritual impersonation of deities (Stuart 2005). Deities are depicted in some of the scenes on the vases and sometimes mentioned in the Primary Standard Sequence (PSS) on the vase, where rulers may adopt the names of these deities (Stuart 2005). Many of these cylindrical vessels with the Primary Standard Sequence (PSS) are also found in burials, showing them to be highly valuable possessions and part of funerary rights (Loughmiller-Cardinal 2019). Specific styles of vases can also be linked to regional workshops (Coe & Kerr 1998; Miller 1999; Miller, Martin & Berrin 2004; Reents-Budet & Bishop 1998; Reents-Budet 1994; Reents-Budet et al. 2000, 2010) suggesting political control of how they were circulated. Further, there are also examples of the Primary Standard Sequence (PSS) that label cacao as being from various polities, suggesting ritual consumption was tied to political action (Kaufman & Justeson 2007; Stuart 2005).

Loughmiller-Cardinal (2019) thus suggests we should view the Primary Standard Sequence (PSS) as symbolic and commemorative of events where vases were used, and part of enabling political rights and responsibilities, as opposed to being used for consumption of foodstuffs.
4 A Corpus Analysis of the Primary Standard Sequence (PSS) on Mayan Vases

In complement to Loughmiller-Cardinal’s (2019) analysis, this section presents the results of a corpus linguistic analysis of the Primary Standard Sequence (PSS) to see how the social context of use may have affected the linguistic interpretation of the writing on vases. As noted in section (2), this study includes examples of the PSS from all kinds of portable objects, though most examples are of the cylindrical vessels studied in Loughmiller-Cardinal (2019). Also, as noted in section (2), this study specifically examines the content of phrases with ch’ok ‘unripe, youth, heir’ and tee’eel ‘orchard’. Section (4.1) discusses the overall frequencies and distributions of ch’ok ‘unripe, youth, heir’ and tee’eel ‘orchard’. Section (4.2) provides an n-gram analysis of these terms, and section (4.3) provides a collocate analysis of these terms.

4.1 Overall Frequencies and Distribution of tee’eel and ch’ok

Ch’ok ‘unripe, youth, heir’ has a few hieroglyphic spellings including <CH'O-KO>, <Ch'o-ko> and <ch'o[ko]>. The most common spelling is <ch'o-ko> while almost all examples of ch’ok ‘unripe, youth, heir’, regardless of spelling, come from the Late Classic (600-900 A.D.). Almost all examples of ch’ok ‘unripe, youth, heir’ also come from some kind of painted or polychrome vase or vessel as well, but not all. This result may be due to the fact that Late Classic and painted or polychrome vase or vessels are the most common in the database overall. Table (6.2) below gives the overall absolute frequencies, the absolute frequencies per time period, and the absolute frequencies per media type in a given time period and overall for the different spellings of ch’ok ‘unripe, youth, heir’:
<table>
<thead>
<tr>
<th>Glyphic Transliteration of ch'ok 'unripe, youth, heir'</th>
<th>Overall Absolute Frequency</th>
<th>Time Periods</th>
<th>Absolute Frequency per Time Period</th>
<th>Media Type</th>
<th>Absolute Frequency per Media Type in a Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>ch'o-ko</td>
<td>134</td>
<td>Early Classic</td>
<td>24</td>
<td>Carved and Incised Ceramic Plate</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cylindrical Vessel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Jadeite Clamshell Pectoral</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mace Head</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painted Pottery Bowl</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painted Pottery Vessel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polychrome Plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polychrome Pottery Plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polychrome Pottery Vessel</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polychrome Tripod</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Early-Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Late Classic</td>
<td>110</td>
<td>Carved and incised pottery vessel</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Carved pottery vessel</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Carved vase</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ceramic Bowl</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cylindrical Vessel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flaring cylindrical vessel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Incised and carved pottery vessel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Incised pottery vase</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Incised pottery vessel</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Miniature Flask</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painted pottery bowl</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painted pottery vase</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painted pottery vessel</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pendant</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polychrome ceramic vessel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polychrome pottery plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polychrome pottery vessel</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Glyphic Transliteration of ch'ok ‘unripe, youth, heir’</td>
<td>Overall Absolute Frequency</td>
<td>Time Periods</td>
<td>Absolute Frequency per Time Period</td>
<td>Media Type</td>
<td>Absolute Frequency per Media Type in a Time Period</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>-----------------------------</td>
<td>--------------</td>
<td>-----------------------------------</td>
<td>------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td><strong>ch'o[ko]</strong></td>
<td>5</td>
<td>Early Classic</td>
<td>3</td>
<td>Ceramic Bowl, Painted Pottery Plate, Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>2</td>
<td>Carved and Incised, Painted Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td><strong>CH'OK</strong></td>
<td>1</td>
<td>Early Classic</td>
<td>1</td>
<td>Painted Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>2</td>
<td>Cylindrical Vessel, Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>142</td>
<td>Early Classic</td>
<td>28</td>
<td>Painted and/or polychrome, Carved and/or Incised, Vases or Vessels, Plates, Bowls, Other Portable Objects</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Early-Late Classic</td>
<td>1</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>115</td>
<td></td>
<td>118</td>
</tr>
</tbody>
</table>

266
Table 6.2. Spelling variations of *ch'ok* ‘unripe, youth, heir’, their absolute frequencies, and their absolute frequencies per time period and absolute frequencies per media type in a time period and overall based on the 2019 updated version of Mora-Marin’s (2004b) classification.

*Tee'eel* ‘orchard’ can have a variety of spellings given the nature of the hieroglyphic script and variation in Mayan languages. Chapter 4 noted that the abstractive suffix can take the form of *-aal, -iil, or -(VVl)eel* in hieroglyphic texts, and colonial sources attest that the abstractive suffix can be reduced to *-l* when followed by an *-aal* possessive suffix (Macri 1997; Mora-Marin with Wiesen 2019; Smailus 1975). Possible spellings include <TE'-e-le>, <TE'-le>, <TE'-li>, and possibly <TE'-e> and <TE'-le-la>. This study also included two instances that may have a reversed reading order, <le-TE'> and <la?-TE'>. An example from Tikal in the Late Classic discussed below, K8008, contrasts distinct spellings of <TE'-e-le> and <TE'-e> and thus suggests that these spellings may refer to different words such as *tee'eel* ‘orchard’ and *tee’* ‘tree’, respectively. All possible spellings are included here, but this issue merits further consideration.

The most common spelling is <TE'-le>, while almost all examples of *tee'eel* ‘orchard’, regardless of spelling come from the Late Classic (600-900 A.D.) by the time the PSS had been established. Almost all examples of *tee'eel* ‘orchard’ also come from some kind of painted or polychrome vase or vessel as well, but not all. This is similar to the results for *ch'ok* ‘unripe, youth, heir’, but *ch'ok* ‘unripe, youth, heir’ is more frequent overall. *Ch'ok* ‘unripe, youth, heir’, has a frequency of 142 while *tee'eel* ‘orchard’ only has a frequency of 90. Further, *ch'ok* ‘unripe, youth, heir’ occurs on other portable objects besides vases/vessels, bowls, and plates. As noted in chapter 4, *ch'ok* ‘unripe, youth, heir’ also occurs more frequently in monumental architecture. Thus, it seems *ch'ok* ‘unripe, youth, heir’ has a more widespread distribution across media types and corresponding social contexts of use of these media. Table (6.3) below gives the absolute
frequencies, the absolute frequencies per time period, the absolute frequencies per media type in
a time period, and overall for spellings of *tee'eel* ‘orchard’:

<table>
<thead>
<tr>
<th>Glyphic Spelling of <em>tee'eel</em> ‘orchard’</th>
<th>Overall Absolute Frequency</th>
<th>Time Periods</th>
<th>Absolute Frequency per Time Period</th>
<th>Media Type</th>
<th>Absolute Frequency per Media Type in a Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE'-le</td>
<td>76</td>
<td>Early Classic</td>
<td>2</td>
<td>Cylindrical Vessel Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Early-Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>73</td>
<td>Incised onyx bowl Incised pottery vessel Painted pottery plate Painted pottery vase Painted pottery vessel Polychrome pottery vessel Polychrome tripod pottery vessel Polychrome vessel Pottery vessel Tripod pottery vessel lid Vase</td>
<td>1</td>
</tr>
<tr>
<td>TE'-e-le</td>
<td>4</td>
<td>Early Classic</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>4</td>
<td>Polychrome Pottery Vessel</td>
<td>0</td>
</tr>
<tr>
<td>TE'-e</td>
<td>4</td>
<td>Early Classic</td>
<td>4</td>
<td>Painted Pottery Plate</td>
<td>1</td>
</tr>
<tr>
<td>Glyphic Spelling of <em>tee'eel</em> ‘orchard’</td>
<td>Overall Absolute Frequency</td>
<td>Time Periods</td>
<td>Absolute Frequency per Time Period</td>
<td>Media Type</td>
<td>Absolute Frequency per Media Type in a Time Period</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------------------------</td>
<td>--------------</td>
<td>-----------------------------------</td>
<td>------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>2</td>
<td>Painted Pottery Vessel</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Painted Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Polychrome Pottery Vessel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Early Classic</td>
<td>7</td>
<td>Painted and/or polychrome Carved and/or Incised Vases or Vessels</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Early Classic</td>
<td>2</td>
<td>Painted and/or polychrome Carved and/or Incised Vases or Vessels</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Early Classic</td>
<td>3</td>
<td>Painted and/or polychrome Carved and/or Incised Vases or Vessels</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total:**

<table>
<thead>
<tr>
<th>Overall Absolute Frequency</th>
<th>Time Periods</th>
<th>Absolute Frequency per Time Period</th>
<th>Media Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>Early Classic</td>
<td>7</td>
<td>Painted and/or polychrome Carved and/or Incised Vases or Vessels</td>
</tr>
<tr>
<td></td>
<td>Early-Late Classic</td>
<td>1</td>
<td>Painted and/or polychrome Carved and/or Incised Vases or Vessels</td>
</tr>
<tr>
<td></td>
<td>Late Classic</td>
<td>1</td>
<td>Painted and/or polychrome Carved and/or Incised Vases or Vessels</td>
</tr>
</tbody>
</table>
### Table 6.3. Spelling variations of *tee’eel* ‘orchard’, their frequencies, and their frequencies per time period and frequencies media type per time period and overall based on the 2019 updated version of Mora-Marín’s (2004b) classification.

<table>
<thead>
<tr>
<th>Glyphic Spelling of <em>tee’eel</em> ‘orchard’</th>
<th>Overall Absolute Frequency</th>
<th>Time Periods</th>
<th>Absolute Frequency per Time Period</th>
<th>Media Type</th>
<th>Absolute Frequency per Media Type in a Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Late Classic</td>
<td>82</td>
<td>Plates</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bowls</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lids</td>
<td>1</td>
</tr>
</tbody>
</table>

The use of *ch’ok* ‘youth, heir, unripe’ and *tee’eel* ‘orchard’ should also be contextualized through comparison with other highly frequent words and their overall dispersion. Table (6.4) shows the top twenty-five glyphic spellings in the PSS in terms of glyph blocks, their absolute and relative frequencies (per 10k), and their dispersion in terms of their range and percentage, or the number of vessels, vases, and other portable objects these spellings occur in:
Table 6.4. Top twenty-five most frequent glyphic spellings in terms of glyph blocks, their absolute and relative frequencies (per 10k), and their dispersion in terms of range and percentage based on the 2019 updated version of Mora-Marín’s (2004b) classification.

<table>
<thead>
<tr>
<th>ID</th>
<th>Type</th>
<th>Absolute frequency (Relative frequency)</th>
<th>Dispersion (Range)</th>
<th>Dispersion (Range %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>yu-k'i-b'i</td>
<td>368 (442.414)</td>
<td>343</td>
<td>42.821</td>
</tr>
<tr>
<td>2</td>
<td>'a-I.S.-ya&lt;sup&gt;46&lt;/sup&gt;</td>
<td>345 (414.763)</td>
<td>325</td>
<td>40.574</td>
</tr>
<tr>
<td>3</td>
<td>ka-wa</td>
<td>182 (218.803)</td>
<td>174</td>
<td>21.723</td>
</tr>
<tr>
<td>4</td>
<td>na-ja</td>
<td>162 (194.758)</td>
<td>156</td>
<td>19.476</td>
</tr>
<tr>
<td>5</td>
<td>yi-chi</td>
<td>108 (129.839)</td>
<td>99</td>
<td>12.360</td>
</tr>
<tr>
<td>6</td>
<td>GOD.N-yi</td>
<td>105 (126.232)</td>
<td>102</td>
<td>12.734</td>
</tr>
<tr>
<td>7</td>
<td>tz'i-b'i</td>
<td>96 (115.412)</td>
<td>96</td>
<td>11.985</td>
</tr>
<tr>
<td>8</td>
<td>ji-chi</td>
<td>94 (113.008)</td>
<td>92</td>
<td>11.486</td>
</tr>
<tr>
<td>9</td>
<td>'a-I.S.</td>
<td>90 (108.199)</td>
<td>88</td>
<td>10.986</td>
</tr>
<tr>
<td>10</td>
<td>'u-tz'i-b’a-li</td>
<td>85 (102.188)</td>
<td>82</td>
<td>10.237</td>
</tr>
<tr>
<td>11</td>
<td>ch'o-ko</td>
<td>83 (99.784)</td>
<td>77</td>
<td>9.613</td>
</tr>
<tr>
<td>12</td>
<td>TE'-le</td>
<td>68 (81.750)</td>
<td>65</td>
<td>8.115</td>
</tr>
<tr>
<td>13</td>
<td>GOD.N</td>
<td>65 (78.144)</td>
<td>61</td>
<td>7.615</td>
</tr>
<tr>
<td>14</td>
<td>'u-tz'i-b'i</td>
<td>62 (74.537)</td>
<td>60</td>
<td>7.491</td>
</tr>
<tr>
<td>15</td>
<td>'u-ja-yi</td>
<td>61 (73.335)</td>
<td>58</td>
<td>7.241</td>
</tr>
<tr>
<td>16</td>
<td>b'a-ka-b'a</td>
<td>56 (67.324)</td>
<td>54</td>
<td>6.742</td>
</tr>
<tr>
<td>17</td>
<td>k'al-ja</td>
<td>54 (64.919)</td>
<td>53</td>
<td>6.617</td>
</tr>
<tr>
<td>18</td>
<td>'u</td>
<td>46 (55.302)</td>
<td>45</td>
<td>5.618</td>
</tr>
<tr>
<td>19</td>
<td>ka</td>
<td>46 (55.302)</td>
<td>37</td>
<td>4.619</td>
</tr>
<tr>
<td>20</td>
<td>ke-KELEM</td>
<td>45 (54.100)</td>
<td>45</td>
<td>5.618</td>
</tr>
<tr>
<td>21</td>
<td>ta</td>
<td>45 (54.100)</td>
<td>40</td>
<td>4.994</td>
</tr>
<tr>
<td>22</td>
<td>CHAK-ch'o-ko</td>
<td>43 (51.695)</td>
<td>41</td>
<td>5.119</td>
</tr>
<tr>
<td>23</td>
<td>T1000a/1002a</td>
<td>43 (51.695)</td>
<td>34</td>
<td>4.245</td>
</tr>
<tr>
<td>24</td>
<td>ta-ju-ta</td>
<td>42 (50.493)</td>
<td>42</td>
<td>5.243</td>
</tr>
<tr>
<td>25</td>
<td>'AJAW</td>
<td>41 (49.291)</td>
<td>35</td>
<td>4.370</td>
</tr>
</tbody>
</table>

The spellings <ch'o-ko> and <TE'-le> are highlighted in yellow in table (6.4). <CHAK-ch'o-ko> is also highlighted in yellow since it contains <ch'o-ko>. Still, the frequencies in the figures (2-3) may be higher since this figure does not necessarily include instances where there are other graphemes in a glyph block with <ch'o-ko> and <TE'-le>. When they occur on their own in a single glyph block, the spellings <ch'o-ko> and <TE'-le> are very common, being the eleventh

<sup>46</sup> I.S. stands for ‘initial sign’, a label for a glyph in the PSS that has not been firmly deciphered to date.
and twelfth most frequent glyph blocks. The glyph block <CHAK-ch'o-ko> is the twenty-second most frequent glyph block. When it occurs on its own in a single glyph block, the spelling <ch'o-ko> has an absolute frequency of 83, a relative frequency of 99.784 (per 10k), and a range of 77. When it occurs on its own in a single glyph block, the spelling <TE'-le> has an absolute frequency of 68, a relative frequency of 81.750 (per 10k), and a range of 65. The glyph block <CHAK-ch'o-ko> has an absolute frequency of 43, a relative frequency of 51.695 (per 10k), and a range of 41. The range is very close to the absolute frequency, indicating that there is usually one instance of each glyph block per vessel, vase, or other portable objects. This is expected given how formulaic and brief PSS texts and the secondary texts accompanying them can be.

4.2 N-gram Analysis of tee'eel and ch'ok

An n-gram analysis on the database was done to see with which words ch'ok ‘unripe, youth, heir’ and tee'eel ‘orchard’ most routinely occur. An n-gram is a predictable string of words that continuously co-occur with each other. The parts of an n-gram are predictable based on the probability that one of its parts occurs. N-grams demonstrate that part of language is routinized, or learned as chunks, and not just composed of individual words that grammatical rules apply to. Table (6.5) shows n-grams with a glyph block span of two and table (6.6) with a glyph block span of three. A glyph block span of two reveals which glyph blocks commonly modify others whether occurring before or after, whereas a glyph block span of three reveals modification both before and after a given glyph block. Table (6.5) and table (6.6) also show the absolute and relative frequencies (per 10k) of each n-gram and the dispersion in terms of range and percentage when the absolute frequency is ten or greater. Any n-grams with spellings of ch'ok ‘unripe, youth, heir’ and tee'eel ‘orchard’ are highlighted in yellow:
<table>
<thead>
<tr>
<th>ID</th>
<th>Type</th>
<th>Absolute frequency (Relative Frequency)</th>
<th>Dispersion (Range)</th>
<th>Dispersion (Range %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>tz'i-b'i na-ja</td>
<td>81 (107.641)</td>
<td>81</td>
<td>10.112</td>
</tr>
<tr>
<td>2</td>
<td>'a-I.S.-ya tz'i-b'i</td>
<td>58 (77.076)</td>
<td>58</td>
<td>7.241</td>
</tr>
<tr>
<td>3</td>
<td>na-ja ji-chi</td>
<td>54 (71.761)</td>
<td>54</td>
<td>6.742</td>
</tr>
<tr>
<td>4</td>
<td>ji-chi yu-k'i-b'i</td>
<td>52 (69.103)</td>
<td>52</td>
<td>6.492</td>
</tr>
<tr>
<td>5</td>
<td>yi-chi 7u-tz'i-b'a-li</td>
<td>50 (66.445)</td>
<td>47</td>
<td>5.868</td>
</tr>
<tr>
<td>6</td>
<td>'a-I.S.-ya GOD.N-yi</td>
<td>46 (61.130)</td>
<td>44</td>
<td>5.493</td>
</tr>
<tr>
<td>7</td>
<td>na-ja yu-k'i-b'i</td>
<td>45 (59.801)</td>
<td>45</td>
<td>5.618</td>
</tr>
<tr>
<td>8</td>
<td>TE'-le ka-wa</td>
<td>44 (58.472)</td>
<td>44</td>
<td>5.493</td>
</tr>
<tr>
<td>9</td>
<td>yu-k'i-b'i ta-yu-ta</td>
<td>34 (45.183)</td>
<td>34</td>
<td>4.245</td>
</tr>
<tr>
<td>10</td>
<td>yu-k'i-b'i ta-T1000a/1002a</td>
<td>32 (42.525)</td>
<td>32</td>
<td>3.995</td>
</tr>
<tr>
<td>11</td>
<td>'a-I.S.-ya GOD.N-yi</td>
<td>29 (38.538)</td>
<td>27</td>
<td>3.371</td>
</tr>
<tr>
<td>12</td>
<td>'u-ja-yi yu-k'i-b'i</td>
<td>28 (37.209)</td>
<td>27</td>
<td>3.371</td>
</tr>
<tr>
<td>13</td>
<td>'u-tz'i-b'a-li 7u-ja-yi</td>
<td>26 (34.551)</td>
<td>25</td>
<td>3.121</td>
</tr>
<tr>
<td>14</td>
<td>'u-tz'i-b'i na-ja-la</td>
<td>26 (34.551)</td>
<td>25</td>
<td>3.121</td>
</tr>
<tr>
<td>15</td>
<td>ta-T1000a/1002a TE'-le</td>
<td>26 (34.551)</td>
<td>26</td>
<td>3.246</td>
</tr>
<tr>
<td>16</td>
<td>GOD.N-yi 'u-tz'i-b'i</td>
<td>25 (33.223)</td>
<td>25</td>
<td>3.121</td>
</tr>
<tr>
<td>17</td>
<td>na-ja-la yu-k'i-b'i</td>
<td>25 (33.223)</td>
<td>25</td>
<td>3.121</td>
</tr>
<tr>
<td>18</td>
<td>'a-I.S.-ya k'al-ja</td>
<td>24 (31.894)</td>
<td>23</td>
<td>2.871</td>
</tr>
<tr>
<td>19</td>
<td>'u-tz'i-b'i na-ja</td>
<td>24 (31.894)</td>
<td>24</td>
<td>2.996</td>
</tr>
<tr>
<td>20</td>
<td>'u-tz'i-b'a-li yu-k'i-b'i</td>
<td>22 (29.236)</td>
<td>21</td>
<td>2.622</td>
</tr>
<tr>
<td>21</td>
<td>'a-I.S. k'al-ja</td>
<td>20 (26.578)</td>
<td>20</td>
<td>2.497</td>
</tr>
<tr>
<td>22</td>
<td>ka-wa ch'o-ko</td>
<td>20 (26.578)</td>
<td>19</td>
<td>2.372</td>
</tr>
<tr>
<td>23</td>
<td>yu-k'i-b'i ta-tzi-hi</td>
<td>18 (23.920)</td>
<td>18</td>
<td>2.247</td>
</tr>
<tr>
<td>24</td>
<td>'a-I.S.-ya t45-step[yi]</td>
<td>16 (21.262)</td>
<td>16</td>
<td>1.998</td>
</tr>
<tr>
<td>25</td>
<td>god.n-yi tz'i-b'i</td>
<td>16 (21.262)</td>
<td>16</td>
<td>1.998</td>
</tr>
<tr>
<td>26</td>
<td>ka-wa CHAK-ch'o-ko</td>
<td>16 (21.262)</td>
<td>16</td>
<td>1.998</td>
</tr>
<tr>
<td>27</td>
<td>yu-k'i-b'i ta-yu-ta-la</td>
<td>16 (21.262)</td>
<td>16</td>
<td>1.998</td>
</tr>
<tr>
<td>28</td>
<td>k'al-ja god.n-yi</td>
<td>15 (19.934)</td>
<td>15</td>
<td>1.873</td>
</tr>
<tr>
<td>29</td>
<td>ta-yu-ta ka-wa</td>
<td>15 (19.934)</td>
<td>15</td>
<td>1.873</td>
</tr>
<tr>
<td>30</td>
<td>GOD.N yi-chi</td>
<td>14 (18.605)</td>
<td>13</td>
<td>1.623</td>
</tr>
<tr>
<td>31</td>
<td>yu-k'i-b'i ta</td>
<td>14 (18.605)</td>
<td>14</td>
<td>1.748</td>
</tr>
<tr>
<td>ID</td>
<td>Type</td>
<td>Absolute frequency (Relative Frequency)</td>
<td>Dispersion (Range)</td>
<td>Dispersion (Range %)</td>
</tr>
<tr>
<td>----</td>
<td>---------------------</td>
<td>-----------------------------------------</td>
<td>--------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>32</td>
<td>CHAK-ch'o-ko ke-kelem</td>
<td>12 (15.947)</td>
<td>12</td>
<td>1.498</td>
</tr>
<tr>
<td>33</td>
<td>ch'o-ko ke-kelem</td>
<td>12 (15.947)</td>
<td>12</td>
<td>1.498</td>
</tr>
<tr>
<td>34</td>
<td>GOD.N yu-k'i-b'i</td>
<td>12 (15.947)</td>
<td>10</td>
<td>1.248</td>
</tr>
<tr>
<td>35</td>
<td>yu-k'i-b'i ka-wa</td>
<td>12 (15.947)</td>
<td>12</td>
<td>1.498</td>
</tr>
<tr>
<td>36</td>
<td>'a-I.S. GOD.N</td>
<td>11 (14.618)</td>
<td>11</td>
<td>1.373</td>
</tr>
<tr>
<td>37</td>
<td>'a-I.S.-ya K'UH</td>
<td>11 (14.618)</td>
<td>10</td>
<td>1.248</td>
</tr>
<tr>
<td>38</td>
<td>yu-k'i-b'i ti-tzi-hi</td>
<td>11 (14.618)</td>
<td>11</td>
<td>1.373</td>
</tr>
<tr>
<td>39</td>
<td>ta-yu-ta-la ka-wa</td>
<td>10 (13.289)</td>
<td>10</td>
<td>1.248</td>
</tr>
<tr>
<td>40</td>
<td>yu-k'i-b'i ti-yu-ta</td>
<td>10 (13.289)</td>
<td>10</td>
<td>1.248</td>
</tr>
</tbody>
</table>

Table 6.5. N-grams with a span of two glyph blocks, their absolute and relative frequencies (per 10k), and their dispersion in terms of range and percentage based on the 2019 updated version of Mora-Marín’s (2004b) classification.

The n-gram analysis with a glyph block span of two shows that n-grams with *tee'eel* ‘orchard’ spelled as <TE'-le> are more frequent than those with *ch'ok* ‘unripe, youth, heir’ spelled as <ch'o-ko>. N-grams with *ch'ok* ‘unripe, youth, heir’ include <ka-wa ch'o-ko> *kakaw* *ch'ok* ‘cacao heir’, <ka-wa CHAK-ch'o-ko> *kakaw chak ch'ok* ‘cacao, great heir’, <CHAK-ch'o-ko ke-kelem> *chak ch'ok keleem* ‘great heir, strong young male’, and <ch'o-ko ke-kelem> *ch'ok keleem* ‘heir, strong young male’. These are the twenty-second, twenty-sixth, thirty-second, and thirty-third most frequent n-grams, respectively. The n-grams with *tee'eel* ‘orchard’ include <TE'-le ka-wa> *tee'eel kakaw* ‘orchard cacao’ and <ta-T1000a/1002a TE'-le> *'ixiim/nal?/najal? tee'eel* ‘for maize?/earnings? orchard’, which are the eighth and fifteenth most frequent n-grams, respectively. The reading of glyph T1000a/1002a is debated. Boot (2004) notes the presence of the syllabogram <'i> in two cases and gives a reading of <'i-'IXIM> *'ixiim* ‘maize’. A similar reading of <NAL> *nal* ‘ear of corn’ has been given by Schele, Mathews, and Lounsbury.

47 *Nal* specifically refers to an ‘maize ear’ whereas *'ixiim* refers to ‘maize kernels’. Since the reading of this glyph is debated, T1000a/1002a will be glossed as generally as ‘maize.’
(1990) because T1000a/1002a can have a syllabic reading of <na> as later suggested by Mora-Marín (2004b, 2005). Stuart (2005) suggests this might be some kind of maize additive for cacao drinks but, notes its variable interpretation in Mayan languages. For example, Kaufman and Justeson (2007:223) note several cases in Mayan languages where 'ixiim tee’ refers to different kinds of plants, and that 'ixiim ‘maize’ was the morphological base for several plant names. However, in the PSS, Kaufman and Justeson (2007:223) also note that T1000a/1002a and kakaw ‘cacao’ sometimes occur apart, and that they should not be interpreted as a single lexical compound, like in plant names. Alternatively, Martin (2009) suggests T1000a/1002a’s use as a modifier of kakaw ‘cacao’ has to do with the maize god’s role in Mayan mythology in the creation of agriculture, most importantly cacao, as discussed in chapter 5. Similarly, Mora-Marín (2005), citing Aulie and Aulie (1978), has noted this connection in Ch’ol mythology with the word ña’al ‘the god of abundance of plants and animals’ and finds it depicted in a vase K4331. Mora-Marín (2004b, 2005) has also identified numerous spellings of T1000a/1002a with the syllabograms <-ja-la>, which he argues could possibly suggest a reading of najal ‘earnings, winnings’. Further, Mora-Marín (2004b, 2005) also makes evident that the use of T1000a/1002a is polyvalent, with different values even being present in the same text:

48 Generally, T1000a/1002a will be transliterated according to the 2019 updated version of Mora-Marín’s (2004b) database. Given differences in interpretation, T1000a/1002a will be transcribed and translated to reflect these differences when discussed out of its discursive context of use. In specific discursive contexts, these examples will be transcribed as ‘ixiim/nal and generically translated as ‘maize’, the common meaning shared between the two terms. To note, nal specifically refers to an ‘ear of corn’ whereas ‘ixiim refers to ‘corn kernels’. If a <ja> syllabogram is used in any context, it will be transcribed and translated as najal ‘earnings’.
Table 6.6. N-grams with a span of three glyph blocks, their absolute and relative frequencies (per 10k), and their dispersion in terms of range and percentage based on the 2019 updated version of Mora-Marín’s (2004b) classification.

<table>
<thead>
<tr>
<th>ID</th>
<th>Type</th>
<th>Absolute frequency (Relative frequency)</th>
<th>Dispersion (Range)</th>
<th>Dispersion (Range %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>'a-I.S.-ya tz'i-b'i na-ja</td>
<td>51 (75.477)</td>
<td>51</td>
<td>6.367</td>
</tr>
<tr>
<td>2</td>
<td>tz'i-b'i na-ja ji-chi</td>
<td>47 (69.557)</td>
<td>47</td>
<td>5.868</td>
</tr>
<tr>
<td>3</td>
<td>na-ja ji-chi yu-k'i-b'i</td>
<td>36 (53.278)</td>
<td>36</td>
<td>4.494</td>
</tr>
<tr>
<td>4</td>
<td>yu-k'i-b'i ta-T1000a/1002a TE'-le</td>
<td>22 (32.559)</td>
<td>22</td>
<td>2.747</td>
</tr>
<tr>
<td>5</td>
<td>yi-chi 'u-tz'i-b'a-li 'u-ja-yi</td>
<td>20 (29.599)</td>
<td>19</td>
<td>2.372</td>
</tr>
<tr>
<td>6</td>
<td>'u-tz'i-b'i na-ja yu-k'i-b'i</td>
<td>19 (28.119)</td>
<td>19</td>
<td>2.372</td>
</tr>
<tr>
<td>7</td>
<td>ta-T1000a/1002a TE'-le ka-wa</td>
<td>19 (28.119)</td>
<td>19</td>
<td>2.372</td>
</tr>
<tr>
<td>8</td>
<td>'u-tz'i-b'i na-ja-la yu-k'i-b'i</td>
<td>18 (26.639)</td>
<td>18</td>
<td>2.247</td>
</tr>
<tr>
<td>9</td>
<td>'a-I.S.-ya god.n-yi 'u-tz'i-b'i</td>
<td>17 (25.159)</td>
<td>17</td>
<td>2.122</td>
</tr>
<tr>
<td>10</td>
<td>GOD.N-yi 'u-tz'i-b'i na-ja</td>
<td>14 (20.719)</td>
<td>14</td>
<td>1.748</td>
</tr>
<tr>
<td>11</td>
<td>GOD.N-yi tz'i-b'i na-ja</td>
<td>14 (20.719)</td>
<td>14</td>
<td>1.748</td>
</tr>
<tr>
<td>12</td>
<td>tz'i-b'i na-ja ju-k'i-b'i</td>
<td>14 (20.719)</td>
<td>14</td>
<td>1.748</td>
</tr>
<tr>
<td>13</td>
<td>yu-k'i-b'i ta-yu-ta ka-wa</td>
<td>13 (19.239)</td>
<td>13</td>
<td>1.623</td>
</tr>
<tr>
<td>14</td>
<td>ji-chi yu-k'i-b'i ta-yu-ta</td>
<td>12 (17.759)</td>
<td>12</td>
<td>1.498</td>
</tr>
<tr>
<td>15</td>
<td>na-ja yu-k'i-b'i ta-yu-ta</td>
<td>11 (16.279)</td>
<td>11</td>
<td>1.373</td>
</tr>
<tr>
<td>16</td>
<td>'a-I.S.-ya GOD.N yi-chi</td>
<td>10 (14.799)</td>
<td>9</td>
<td>1.124</td>
</tr>
<tr>
<td>17</td>
<td>'u-tz'i-b'a-li 'u-ja-yi yu-k'i-b'i</td>
<td>10 (14.799)</td>
<td>10</td>
<td>1.248</td>
</tr>
<tr>
<td>18</td>
<td>yi-chi 'u-tz'i-b'a-li yu-k'i-b'i</td>
<td>10 (14.799)</td>
<td>9</td>
<td>1.124</td>
</tr>
</tbody>
</table>

The n-gram analysis with a glyph block span of three only shows n-grams with **tee'eel** ‘orchard’. These n-grams are similar to those just discussed and are <yu-k'i-b'i ta-T1000a/1002a TE'-le> **yuk'ib** 'ta-ixiim/nal?/nal? tee'eel ‘his/her/its cup for maize?/earnings? orchard’ and <ta T1000a/1002a TE'-le ka-wa> *ta 'ixiim/nal?/nal?* ‘for maize?/earnings? orchard cacao’. These are the fourth and seventh most frequent n-grams, respectively. There are no n-grams here with **ch'ok** ‘unripe, youth, heir’.

These n-gram analyses show that **tee'eel** ‘orchard’ frequently modifies **kakaw** ‘cacao’ while T1000a/1002a frequently modifies **tee'eel** ‘orchard’. **Yuk’ib** ‘his or her cup’ also frequently occurs with **tee'eel** ‘orchard’. This suggests a clear relationship of the use of **tee'eel** ‘orchard’
with consumption to some degree. However, as discussed, T1000a/1002a’s exact meaning is unclear and perhaps related to mythology or other social contexts. These n-gram analyses show that *ch’ok* ‘unripe, youth, heir’ is less likely to be used in predictable ways, and indirectly associated with consumption, mostly occurring with *chak* ‘great’ and *keleem* ‘strong young male’. Similarly, in section (3) it was noted that *ch’ok* ‘unripe, youth, heir’ occurs in more media types. Significantly, *tee’eel* ‘orchard’ is not used to directly modify *ch’ok* ‘unripe, youth, heir’ as is seen in metaphorical uses at Palenque.

### 4.3 Collocate Analysis of *tee’eel* and *ch’ok*

An analysis of collocates can tell us what words are generally associated with another but do not necessarily occur continuously next to the examined word. In such texts with restricted phrasing, like the PSS, many words are likely to be associated with each other. However, collocates are important to compare to n-grams because it shows words that might be generally associated with others, without directly modifying them. In such cases, collocates can give clues for how meaning might be shifting over time, based on general associations in a given context. The analysis here only looks for associations within a narrower window or word span, to see what is more closely being associated with *ch’ok* ‘unripe, youth, heir’ and *tee’eel* ‘orchard’, given the high degree of standardization of the PSS. This study examined collocates within three glyph blocks preceding or following *tee’eel* ‘orchard’ when spelled as <$TE'$-le$>$ and *ch’ok* ‘unripe, youth, heir’ when spelled as <$ch'o$-ko$>$. Since searches must be done in terms of glyph blocks, <$CHAK$-$ch'o$-ko$>$ *chak ch'ok* ‘great heir’ was included given that it was shown to frequently

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49 Kaufman and Justeson (2007:223) note that T1000a/1002a and *kakaw* ‘cacao’ sometimes occur apart, and that they should not be interpreted as a single lexical compound. This is in accordance with the n-gram analysis presented here given that n-grams are predicably, or regularly, occurring strings of words that continuously co-occur with each other.
occur as part of an n-gram in the above section. Collocates are determined by using the MI2 statistical score with scores over six being statistically significant at the 5% level and minimum absolute frequency of five. This score basically measures if words are ‘mutually attractive’, occurring more often together than apart, and prioritizes those that do this frequently as opposed to rare collocates. This score remedies a more basic version of the mutual information score that tends to prioritize exclusivity at the expense of frequency.

Table (6.7) lists the collocates of the glyph blocks <ch'o-ko> and table (6.8) the collocates of <CHAK-ch'o-ko>. The figures also list the collocate’s position to the right or left of the search term node, MI2 score, the absolute frequency of the collocation pattern, and the frequency of the collocate in the corpus at large. The search term <ch'o-ko> has <ka-wa> kakaw ‘cacao’, <ke-KELEM> keleem ‘strong young male’, <TE'-le> tee'eel ‘orchard’, and <yu-k'i-b'i> yuk'ib’ ‘his/her/its drinking cup’ as collocates. Even though keleem ‘strong young male’ and chak ‘great’ directly modify or elaborate upon the title ch'ok ‘unripe, youth, heir’, as seen in the n-gram analysis, kakaw ‘cacao’ has a higher MI2 score. Tee'eel ‘orchard’ is also clearly associated with ch'ok ‘unripe, youth, heir’. Yuk'ib’ ‘his/her/its drinking cup’ is also associated, even though it usually occurs towards the beginning of the PSS. Thus, terms for consumption are highly associated with ch'ok ‘unripe, youth, heir’, but also adjectives honoring those with this title. <CHAK-ch'ok> chak ch'ok ‘great heir’ has three additional collocates, <ti-tzi-hi> ti tzih ‘for unripe/raw/uncooked’50, <na-ja-la> najal ‘earnings?’, and <ta-T1000a/1002a> ta-'ixiim/nal?/najal? ‘for maize?/earnings?’ . These additional collocates may be because chak ch'ok ‘great heir’ is spelled in one glyph block, expanding the glyph block range that can be associated with it. The strength of the MI2 score also differs for each shared collocate.

<table>
<thead>
<tr>
<th>ID</th>
<th>Position</th>
<th>Collocate</th>
<th>Stat (MI2)</th>
<th>Absolute Freq. of collocation</th>
<th>Absolute Freq. of collocate in corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L</td>
<td>ka-wa</td>
<td>8.412</td>
<td>25</td>
<td>182</td>
</tr>
<tr>
<td>2</td>
<td>R</td>
<td>ke-KELEM</td>
<td>8.311</td>
<td>12</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>L</td>
<td>CHAK</td>
<td>7.389</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>L</td>
<td>TE'-le</td>
<td>7.189</td>
<td>10</td>
<td>68</td>
</tr>
<tr>
<td>5</td>
<td>L</td>
<td>yu-k'i-b'i</td>
<td>7.028</td>
<td>22</td>
<td>368</td>
</tr>
</tbody>
</table>

Table 6.7. Collocates of <ch'o-ko> with a span of three glyph blocks to the left and right of the search term node, their position to the search term node, their MI2 score, the absolute frequency of the collocation, and the absolute frequency of the collocate in the corpus overall, based on the 2019 updated version of Mora-Marín’s (2004) classification.

<table>
<thead>
<tr>
<th>ID</th>
<th>Position</th>
<th>Collocate</th>
<th>Stat (MI2)</th>
<th>Absolute Freq. of collocation</th>
<th>Absolute Freq. of collocate in corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R</td>
<td>ke-KELEM</td>
<td>9.497</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>L</td>
<td>ti-tzi-hi</td>
<td>8.232</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>L</td>
<td>ka-wa</td>
<td>8.080</td>
<td>16</td>
<td>182</td>
</tr>
<tr>
<td>4</td>
<td>L</td>
<td>na-ja-la</td>
<td>7.845</td>
<td>7</td>
<td>41</td>
</tr>
<tr>
<td>5</td>
<td>L</td>
<td>TE'-le</td>
<td>7.841</td>
<td>9</td>
<td>68</td>
</tr>
<tr>
<td>6</td>
<td>L</td>
<td>ta-T1000a/1002a</td>
<td>7.401</td>
<td>6</td>
<td>41</td>
</tr>
<tr>
<td>7</td>
<td>L</td>
<td>yu-k'i-b'i</td>
<td>7.065</td>
<td>16</td>
<td>368</td>
</tr>
</tbody>
</table>

Table 6.8. Collocates of <CHAK-ch'o-ko> with a span of three glyph blocks to the left and right of the search term node, their position to the search term node, their MI2 score, the absolute frequency of the collocation, and the absolute frequency of the collocate in the corpus overall, based on the 2019 updated version of Mora-Marín’s (2004) classification.

Table (6.9) lists the collocates of the glyph block <TE'-le> and the collocates’ position to the right or left of the search term node, MI2 score, the absolute frequency of the collocation pattern, and the frequency of the collocate in the corpus at large. The search term <TE'-le> has many more collocates than <ch'o-ko> and <CHAK-ch'o-ko>, likely because it is more exclusively used in certain contexts. The collocates include <ta-T1000a/1002a> ta 'ixiim/nal/?/najal? ‘for maize?/earnings?’, <ka-wa> and <ka-ka-wa> kakaw ‘cacao’, <yu-k'i-b'i>
yuk’ib‘his/her/its drinking cup’, <ta-yu-ta> ta yutal ‘for its seeds?/contents?’51, <CHAK-ch'ok> chak ch'ok ‘great heir’, <ch'ok> ch’ok ‘unripe, youth, heir’, <T1000a/1002a> 'ixiim/nal?/najal? ‘for maize?/earnings?’, <na-ja-la> and <na-ja> najal? ‘earnings?’, and <ke-KELEM> keleem ‘strong young male’. The collocates of the syllabograms <ka> and <b'a> may be under-spellings. A notable difference is the addition of the collocate <ta-yu-ta> ta yutal ‘for its seeds?/contents?’ and the absence of <ti-tzi-hi> ti tzih ‘for unripe/raw/uncooked’. The collocate <ta-yu-ta> ta yutal ‘for its seeds?/contents?’ seems more relevant here than the n-gram analysis depicted, thus possibly emphasizing the use of tee’eel ‘orchard’ with foodstuffs, though its interpretation is uncertain. Again, <CHAK-ch'o-ko> chak ch'ok ‘great heir’ and <ch'ok> ch’ok ‘unripe, youth, heir’ are collocates of <TE'-le>, with <CHAK-ch'o-ko> having a higher MI2 score. This suggests that more emphasis on honoring those with the title ch’ok ‘unripe, youth, heir’ increased the likelihood that tee’eel ‘orchard’ would be mentioned.

51 The term yutal will be glossed as ‘its seeds?/contents?’ in the context of the PSS because its reading is uncertain. MacCleod’s (1990) interpretation of yutal as ‘its seeds’ is based on the root *(h)ut ‘fruit’. In response to MacCleod’s (1990) interpretation, Justeson (2017 personal conversation in Loughmiller-Cardinal 2019) noted the example of <u-yu-ta-li> from vessel K1335. Justeson argued the y- cannot be the third person singular ergative marker used for possession, since u also has this function. Instead, it may be the lost Ch’olan cognate of proto-Tzeltalan *yut, ‘inside’, and have a meaning of ‘contents’ in the PSS. However, Mora-Marín (2021 personal communication) noted another example of <u-yu-ta-li> from vessel K2573 without the third person singular ergative marker used for possession, suggesting <yu-ta-li> is spelling the possessed form of ortal ‘seeds’. Mora-Marín (2021 personal communication) also noted though that both vessels have idiosyncratic spellings, so a firm reading of <yu-ta-li> is undetermined as of now.
Table 6.9. Collocates of <TE'-le> with a span of three glyph blocks to the left and right of the search term node, their position to the search term node, their MI2 score, the absolute frequency of the collocation, and the absolute frequency of the collocate in the corpus overall, based on the 2019 updated version of Mora-Marín’s (2004) classification.

Table (6.10) summarizes the shared collocates of <ch'o-ko>, <CHAK-ch'o-ko>, and <TE'-le> giving the shared collocate, the absolute frequency of the collocate in the corpus, the number of search term nodes that have the collocate, and the search term nodes. Figure (6.1) provides a visualization of the relationship of these shared collocates. The collocates closest to the search term nodes in figure (6.1) are those with the strongest mutual information score, which measures the strength of association between the node and the collocate. Darker circles indicate that a collocate occurs more frequently with tee'eel ‘orchard’ over the other collocates. Collocates that occur after the search term node are placed to the right and collocates that occur preceding tee'eel ‘orchard’ are placed to the left. The collocates shared by all of the search term nodes are <ka-wa> kakaw ‘cacao’, <ke-KELEM> keleem ‘strong young male’, and <yu-k'i-b'i> yuk'ib’ ‘his/her/its drinking cup’. The search terms <CHAK-ch'o-ko> and <TE'-le> also share the
collocates <T1000a/1002a> 'ixiim/nal?/najal? ‘maize?/earnings?’ and <na-ja-la> najal? ‘earnings?’.

These collocates suggest an association with consumption but, also an association with the title ch'ok ‘unripe, youth, heir’ that was being venerated.

<table>
<thead>
<tr>
<th>ID</th>
<th>Term</th>
<th>Absolute Freq. of collocate in corpus</th>
<th>No. of Nodes Shared</th>
<th>Nodes Shared</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ka-wa</td>
<td>182</td>
<td>3</td>
<td>CHAK-ch'o-ko, ch'o-ko, TE'-le</td>
</tr>
<tr>
<td>2</td>
<td>ke-KELEM</td>
<td>45</td>
<td>3</td>
<td>CHAK-ch'o-ko, ch'o-ko, TE'-le</td>
</tr>
<tr>
<td>3</td>
<td>na-ja-la</td>
<td>41</td>
<td>2</td>
<td>CHAK-ch'o-ko, TE'-le</td>
</tr>
<tr>
<td>4</td>
<td>ta-T1000a/1002a</td>
<td>41</td>
<td>2</td>
<td>CHAK-ch'o-ko, TE'-le</td>
</tr>
<tr>
<td>5</td>
<td>yu-k'i-b'i</td>
<td>368</td>
<td>3</td>
<td>CHAK-ch'o-ko, ch'o-ko, TE'-le</td>
</tr>
</tbody>
</table>

Table 6.10. Shared collocates of <ch'o-ko>, <CHAK-ch'o-ko>, and <TE'-le>, the absolute frequency of the collocate in the corpus overall, the number of search term nodes that have the collocate, and the search term nodes that have the collocate, based on the 2019 updated version of Mora-Marín’s (2004) classification.
Figure 6.1. Visualization of shared collocates of <ch'o-ko>, <CHAK-ch'o-ko>, and <TE'-le> showing the position of the collocate to the search node, the strength of the MI2 score (with shorter lines having a stronger mutual information score), darker gray circles being more frequent, and orange circles and dotted lines indicating shared collocates, based on the 2019 updated version of Mora-Marín’s (2004) database. Glyphic transliterations are spelled based on this database where <7> = < ' >, <tsi> = <tzi>, and <T1000a/1002a> = <T1000a/t1000a>.

4.5 Summary

*Ch'ok* ‘unripe, youth, heir’ is more frequent and occurs on more media types, including portable objects that are not vessels, vases, or other kinds of containers than *tee'eel* ‘orchard’. An n-gram analysis revealed that *tee'eel* ‘orchard’ does not predictably modify *ch’ok* ‘unripe, youth, heir’. Additionally, a manual examination of all examples with *tee'eel* ‘orchard’ shows this is never the case. A collocate analysis showed what terms are exclusively associated with each other and thus a presupposed context of linguistic and social use. Though the PSS is restricted in the length and types of glyphs that it uses, not all terms are collocates of *ch'ok* ‘unripe, youth, heir’ and *tee'eel* ‘orchard’, such as the GOD.N glyph, which may have a reading of *hu'/u* ‘to
sigh, to finish’ (Mora-Marín 2007). The shared collocates point to a presupposed context about consumption but, also a context which focused on venerating those with the *ch'ok* ‘unripe, youth, heir’ title.

5 Shifting Meanings: A Discourse Analysis of Metaphor across Modalities and Media

The corpus linguistic analysis presented above shows that most words associated with *tee'eel* ‘orchard’ and *ch'ok* ‘unripe, youth, heir’ have to do with consumption but there are also associations with words whose purpose is to venerate the *ch'ok* ‘unripe, youth, heir’ mentioned in a given text. As noted, Loughmiller-Cardinal (2019) also shows that the association between vases with the PSS and food consumption must have been indirect. This section provides a Bakhtinian discourse analysis here, as outlined by Wortham and Reyes (2015), to contextualize the uses of the PSS and show how the meaning of some aspects of the PSS slowly shifted to be used differently at Palenque to express the metaphor *RULERS ARE TREES*, specifically by examining uses of *tee'eel* ‘orchard’. This study also provides a multimodal discourse analysis, showing how the shift of the meaning of *tee'eel* ‘orchard’ was also inspired by visual expressions of the metaphor on vases. Section (5.1) specifically describes some of the ways in which the PSS was enregistered in regards to uses of *tee'eel* ‘orchard’, presents examples of the PSS that show the configuration of *tee'eel* ‘orchard’ as an indexical, and how *tee'eel* ‘orchard’ may have begun being reconfigured. Section (5.2) details how the uses of *tee'eel* ‘orchard’ were reconfigured and recontextualized at Palenque as part of a general process of re-enregisterment.
5.1 Enregisterment of the PSS and the Configuration of tee’eel as an Indexical

As noted above, previous epigraphic and archaeological research affirm that the PSS was standardized well into the Early Classic period around 450 A.D. (Reents-Budet 1994), if not early in the Late Preclassic (300 B.C. – 200 A.D.) (Mora-Marín 2004b), warranting labeling these texts as fully enregistered. Texts are enregistered when they regularly identify certain social classes of people (Agha 2007; Wortham & Reyes 2015). Vases with the PSS were involved in performing political rituals and thus were clearly an important marker of elite status (Mora-Marín 2004b). Though reviewing all the details of how the PSS became enregistered is beyond the scope of this study, it is worth reviewing some aspects of these texts in light of this process. First, any textual style that eventually becomes enregistered must first become entexualized where speech events are regularly believed to perform a certain kind of social action (Silverstein 1992, 1993; Wortham & Reyes 2015). This social action is partially established by marking the relevance of a text to the social world in which it is performed (Wortham & Reyes 2015). Texts do this by implicitly or explicitly demarcating what is the narrative event, the story being told, from the narrating event, the event of telling the story itself (Wortham & Reyes 2015). More specifically, the narrative event is the content of a text or “what is being talked about”, while the narrating event is the wider social and linguistic context in which the text is situated and is used by various social actors (Jakobson 1957/1971; Wortham and Reyes 2105:3). This distinction is essential in understanding the true social meaning behind a text since narrators are not always transparent, direct, or honest.

Loughmiller-Cardinal’s (2019) study makes this distinction relevant by showing that the content of the PSS did not directly describe what vases with the PSS were actually used for. Based on Loughmiller-Cardinal (2019), the narrated event of the PSS describes that vases with
the PSS were possessions of elites used for food consumption. However, the narrating event is distinct, involving the creation and use of these vases in political rituals where these vases were likely not used directly for consumption. Linguistic evidence in the texts themselves makes this distinction relevant as well and shows that the PSS was clearly being used to perform a social action. Reported speech often indicates how the narrated event is demarcated from the narrating event, by labeling what is not being said, or asserted, in the present moment (Wortham & Reyes 2015: 6, 49-50). Reported speech occurs in some examples of the PSS with the quotative particle *che’en* ‘he/she/it said it’ as seen in example (6.1) of an early polychrome pottery vessel (Mora-Marín 1999; Stuart et al 1999):

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52 Justeson 2021 (personal communication) suggests the PSS may have recorded what was said about other vases used for consumption in ceremonial occasions.

53 Following Mora-Marín (2001, 2005), this study uses I.S. as a gloss for the ‘introductory sign’ whose exact reading is still debated.
Though not reported speech, other labels in the PSS can help demarcate the narrated event from the narrating event. The labeling of vessel type, the frequent mention of whether the vessel was carved or painted, and of the writing or image on the vase itself in the PSS helps establish the text’s role and identity in the social world.

Deictics also point to this distinction, by presuming a certain social context. This is seen in example (6.2) with a Late Classic polychrome pottery vessel:\n
\[55\] This verb has been interpretated as having a meaning of ‘dedicate’, but will not be glossed as such because it is not attested in any Mesoamerican language.\n
\[55\] In the context of examples, hyphens <-> represent distinct morpheme or hieroglyphic grapheme, as discussed in chapter (2). They do not represent the writing convention that breaks up a continuous word that extends to a subsequent line.
In example (6.2), *utz'ib'al* ‘his/her/its writing’ and the *yu'ik* ‘his/her/its cup’ point to the aspect of the text’s and vase’s social identity by explicitly labeling it and also marking it as possessed by the holder of the *ch'ok* ‘unripe, youth, heir’ title through using the deictic ergative pronominal markers *u=* and *y=* ‘his/her/its’. Further, the vase’s role is mentioned by the phrase *ta nal/xiiim kakaw* ‘for maize cacao’. These labels situate the text as being relevant in elite political affairs, especially through possession of the writing itself. As noted in section (3), the vases themselves, their writing and images, and the political elites who owned them were all ritually commemorated in a similar manner (Mora-Marín 2004b).

For enregisterment to occur, a constellation of signs must also collectively come together to presume the same social context across texts (Jakobson 1960; Silversteen 1992, 1993; Wortham & Reyes 2015). Such signs, called indexicals, help establish social action through presuming the same context. In the case of enregisterment, this context involves associating a
text with an entire group of people who normally perform the given text (Wortham & Reyes 2015). Indexicals that point to a presumed context can include those just discussed that were used to establish the narrated and narrating events – reported speech and deictics – but also, evaluative terms which point to social opinions in a text (Wortham & Reyes 2015). The standardization of the PSS shows a configuration of indexicals where labeling of the vessel type, vessel owner and their titles, the images, writing or speech of vessel, and the proclaimed foodstuff contents the vessel was used for, are all routinely used. The corpus linguistic analysis used above is useful in understanding what signs presuppose each other by measuring word association in various ways. The n-grams and collocates analyzed for ch'ok ‘unripe, youth, heir’ and tee’eel ‘orchard’ show what words were being associated and mutually presupposed the use of ch'ok ‘unripe, youth, heir’ and tee’eel ‘orchard’. It is beyond the scope of this study to analyze all of the indexicals for the Primary Standard Sequence, but such a project would be feasible in the future. The configuration of tee’eel ‘orchard’ as an indexical and how it may have begun to be reconfigured is focused on here.

Example (6.3) is a Late Classic painted pottery vessel and provides the context of such associations by showing an example of the PSS on a vase where the owner is unnamed, but their title is given, as well as the kind of vase and its proclaimed foodstuff contents. Example (6.3) also uses many of the collocates associated with tee’eel ‘orchard’ discussed above including yuk’ib’ ‘his/her/its cup’, ’ixiim ‘maize’, kakaw ‘kakaw’ and chak ch’ok ‘great heir’:

56 As discussed in section (3), there is no evidence in the form of chemical residue or use ware that these vessels were used for the consumption of foodstuffs (Loughmiller-Cardinal 2019).
Example (6.3) emphasizes not only foodstuffs and the kind of vessel but emphasizes the title of the owner with elaborating modifiers, by calling him chak ‘great’ and keleem ‘strong young male’. This kind of elaboration of titles is common throughout Mayan hieroglyphic texts but can be done to varying degrees and is not always present in the PSS. Here, tee'eel ‘orchard’ is a positive evaluative indexical, bearing special mention of the kind of cacao a great elite possesses.

Several examples are suggestive of how tee'eel ‘orchard’ may have become an evaluative indexical associated with political elites and not just foodstuffs, and thus its contribution to the general enregisterment of the PSS. Example (6.4) shows an incised or carved vase with a lid and feet from the Early Classic period that has a much more elaborated Primary Standard Sequence text. Interestingly, the vase has a spelling <'AJAW-TE'?-?la> which may indicate that tee'eel ‘orchard’ is compounded with 'aajaaw ‘ruler’ to give a reading of 'aajaawtee'eel /'aajaawtee'laal ‘ruler of the orchard/lineage?’.

As noted in chapter four, 'aajaawtee’ ‘tree ruler’ is a common title
in the hieroglyphic corpus. It’s unclear if <'AJAW-TE'?-la> simply contains a spelling variation of tee'eel ‘orchard’ or spells another word and thus has a different meaning. Specifically, if tee'eel ‘orchard’ is being spelled, the <la> syllabogram would be spelling the underlying -aal element of the reconstructed -aaleel abstractive suffix (Mora-Marín with Wiesen 2019). Another possibility is that it indicates possession with the use of the abstractive suffix -(VVl)VVl. In such a case, it would be under-spelled, missing the third person singular ergative marker. As noted in chapter four, the suffix -aal/-al is used when te'-il ‘orchard’ was possessed in colonial Yokot'an (Chontal) in The Paxbolon Maldonado Papers.

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57 Polian (2018:14) notes that in Tzeltal the term ajate'al ‘white sapote grove/orchard’ is morphologically composed of ajaw ‘ruler’ and te ‘tree’ and the abstractive suffix, just like the title ajawte ‘tree ruler’ in the hieroglyphic corpus. Presumably, the term for ‘white sapote’ originated later in time since it is a compound form and ajaw ‘ruler’ is clearly attested as a title on its own in the hieroglyphic corpus.
In contrast to example (6.3), in example (6.4), *ajaawtee'el/ajaawteelaal* ‘ruler of the orchard/lineage?’ occurs separately from *kakaw* ‘cacao’ in its own prepositional phrase and does not act as a modifier. This may suggest a more direct association of *tee'eel* ‘orchard’ with political elites and a metaphoric shift to have the sense of ‘lineage’. Further, the syntactic parallelism of the text heightens any possible reconfiguration of the use of *tee'eel* ‘orchard’ as an indexical. Three prepositional phrases occur next to each other, *ta kakaw* ‘for cacao’, *ta...
'aajaawtee'eel/'aajaawtee'laal, and ta tzih? kakaw ‘for fresh? cacao’ and suggest complementary or extended meanings of each phrase, a common poetic device in Mayan languages (Hull & Carrasco 2012). Thus, the meaning of ’aajaawtee'eel/'aajaawtee'laal as ‘ruler of the orchard/lineage?’ is clearly demarcated as distinct from kakaw ‘cacao’, specifically tzih? kakaw ‘cacao’, but still intimately related to it. Finally, the parallelism between the phrases that start with yuk'ib’ ‘his/her/its cup’, heighten the referent vessel’s connection not just to foodstuffs, like kakaw ‘cacao’, but also writing with the possible mention of ?sabak ‘ink’. This highlights the vessel’s role in recording the symbolic and ritual uses of this vessel, beyond however it was physically used, thus providing impetus for any shifting meanings of tee'eel ‘orchard’.

Example (6.5) is of a vase from the Late Classic and may also show tee'eel ‘orchard’ when spelled as <TE'-la> with a <ya> syllabogram in front. The syllabogram <ya> possibly indicates the third person singular ergative marker and a possessive reading of <ya-TE'-la>. This also thus suggests a possessive reading is possible in example (6.4), which contained the same <TE'-la> after <'AJAW> as well.
(6.5)

<table>
<thead>
<tr>
<th>'a-ja</th>
<th>GOD.N-yi</th>
<th>'u-tz'i-b'a-li</th>
<th>yu-k'i-b'i</th>
<th>ta-T1000a/1002a</th>
</tr>
</thead>
<tbody>
<tr>
<td>'aj</td>
<td>hu'-uy-i-∅</td>
<td>u=tz'ib'-li</td>
<td>y-uk'-ib'</td>
<td>ta nal/iixiim</td>
</tr>
<tr>
<td>?</td>
<td>to.sigh/to.finish-INCHO-CMPL-3SG.ABS(^{58})</td>
<td>3SG.ERG=write-POSS4(^{59})</td>
<td>3SG.ERG-to.drink-INST</td>
<td>PREP maize</td>
</tr>
<tr>
<td>ya-TE'-?la</td>
<td>ka-wa</td>
<td>'o-k'a</td>
<td>?-HIX</td>
<td>B'ALAM</td>
</tr>
<tr>
<td>ya-tee'-laal?</td>
<td>kakaw</td>
<td>'ok'?</td>
<td>?-hix</td>
<td>b'alam</td>
</tr>
<tr>
<td>3SG.ERG?-tree-ABSTR?</td>
<td>cacao</td>
<td>?</td>
<td>? ocelot, male jaguar(^{60})</td>
<td>jaguar</td>
</tr>
<tr>
<td>3-?</td>
<td>yo-tz'i-ni</td>
<td>b'a-ka-b'a</td>
<td>'u-B'AH</td>
<td>?-ni</td>
</tr>
<tr>
<td>ox-?</td>
<td>y-ihtziin?(^{61})</td>
<td>b'akab'</td>
<td>u=b'ah</td>
<td>?</td>
</tr>
<tr>
<td>three</td>
<td>3SG.ERG-younger.brother?</td>
<td>elite.title</td>
<td>3SG.ERG=image</td>
<td>?</td>
</tr>
<tr>
<td>xi</td>
<td>'aj-b'a-'AJAW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>'aj-b'ah-'ajaaw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>MASC-head-ruler</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

'It became imbued with breath/finished, the writing for his cup for maize, his? orchard? cacao; ocelot/male jaguar?, jaguar, younger brother? of the B'akab'; his image, he of the head ruler.'

(Photo by Kerr (n.d.-b: K2353); digital image courtesy of Justin Kerr; cropped by author; transliteration courtesy of Mora-Marín (2004b).

In contrast to example (6.4), example (6.5) shows <TE'-?la> modifying kakaw ‘cacao’ directly on its own. This suggests the spelling of <TE'-?la> has meaning similar to that of the <TE'-le> spelling of tee'eel ‘orchard’, and other examples of this spelling, like in (6.4) should be interpreted similarly. Further, that tee'eel/tee'laal ‘(his/her/its) orchard’ is possessed heightens and draws even more attention to its use as a noteworthy indexical. As noted, deictics, here the

\(^{58}\) Interpretation of the God.N glyph is based on Mora-Marín (2020c).

\(^{59}\) Interpretation of -Vl suffix as dative possession based on Mora-Marín (2019, 2020c).

\(^{60}\) Helmke et al (2015) argue that hix refers to an ocelot, while Bassie-Sweet (2019) argues hix refers to a male jaguar so both translations are included.

\(^{61}\) This reading is uncertain.
possessive marker, are common indexicals. The possessive marker also makes tee'eel/tee'laal ‘(his/her/its) orchard’ stand out by demarcating it from the entire noun phrase in the prepositional phrase ta nal/'ixiim yateelaal kakaw ‘for maize, (his/her/its) orchard cacao’. Similar to example (6.4), example (6.5) emphasizes the important role of the vessel in recording symbolic and ritual uses of the vase through presenting the phrases utzip'il ‘his writing’ and yuk'ib’ ‘his cup’ in parallel, and through the vase’s attentional mention of ub'ah ‘his image’.

Example (6.6) is of a Late Classic polychrome pottery vessel and contrasts different usages of tee’ ‘tree’:

(6.6)

<table>
<thead>
<tr>
<th>yu-k'i-b'i</th>
<th>ta-yu-ta-la</th>
<th>T1000a/1002a</th>
<th>TE'-e-le</th>
<th>ka-kawa</th>
</tr>
</thead>
<tbody>
<tr>
<td>y-uk'-ib'</td>
<td>ta y-utal</td>
<td>nal/'ixiim</td>
<td>tee'-eel</td>
<td>kakaw</td>
</tr>
<tr>
<td>3SG.ERG-to.drink-INST</td>
<td>PREP 3SG.ERG-seeds?/contents??</td>
<td>maize</td>
<td>tree-ABSTR</td>
<td>cacao</td>
</tr>
<tr>
<td>K'INICH</td>
<td>'aj-CHAK-K'UH</td>
<td>TE'-e</td>
<td>III-KATUN</td>
<td>?-?</td>
</tr>
<tr>
<td>k'inich</td>
<td>'aj-chak-k'uuuh</td>
<td>tee'</td>
<td>ox katun</td>
<td>?-?</td>
</tr>
<tr>
<td>sun.eyed</td>
<td>MASC-red/great-god</td>
<td>tree</td>
<td>three periods.of.twenty.years</td>
<td>?</td>
</tr>
<tr>
<td>?-?</td>
<td>CHAN-na-CHAK-la</td>
<td>K'UH-UL-MUTUL-'AJAW</td>
<td>CHAK-?la-TE'</td>
<td></td>
</tr>
<tr>
<td>?-?</td>
<td>chan chak-la</td>
<td>k'uuh-uel mutul 'ajaaw</td>
<td>chahk-la? tee'</td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>sky rain.deity-?</td>
<td>god-ABSTR Tikal ruler</td>
<td>rain.deity tree</td>
<td></td>
</tr>
</tbody>
</table>

‘It is his cup for the seeds?/contents? of maize orchard cacao, sun eyed, he of the great god tree, three katun, Sky Rain Deity (Chak), holy polity of Tikal ruler, Rain Deity (Chak) Tree’

(Info by Kerr (n.d.-b: K8008); digital image courtesy of Justin Kerr; cropped by author; transliteration courtesy of Mora-Marín (2004b).
In example (6.6), different spellings with tee’ ‘tree’ are given, suggesting different meanings. The author left no ambiguity and spelled <TE'-e-le> to represent tee'eel ‘orchard’ while contrasting tee’ ‘tree’ with a spelling of <TE'-e>. Though these uses are not syntactically parallel as in the previous examples, the different usages in the same text suggest connected meanings. The owner of the vessel is labeled as ‘aj chak k'uuh tee’ ‘he of the great god tree’ right after the labeling the mention of nal/iixim tee'eel kakaw ‘maize orchard cacao’. The owner is then explicitly connected with the rain deity Chahk whose name is elaborated with the use tee’ ‘tree’ at the very end of the text and who had a clear role and significance for Mayan understandings of agriculture. Regardless of the author’s intentions, the linguistic context would allow one to construe a relationship in meaning between tee'eel ‘orchard’ and the ruler and the deity Chahk who were both labeled as tee’ ‘tree’. Connections between foodstuffs, rulers, and deities, would help the meaning of tee'eel ‘orchard’ be reconfigured as an indexical and point to semantic associations beyond foodstuffs.

Example (6.7) is a polychrome pottery vessel from the Late Classic that shows tee'eel ‘orchard’ in a unique position:
In example (6.7), *tee'eel* ‘orchard’ occurs after *kakaw* ‘cacao’ whereas it typically occurs before as a modifier. Not modifying *kakaw* ‘cacao’ may show its meaning was being shifted by being used in a new grammatical and discursive context. However, *tee'eel* ‘orchard’ is spelled backward as <le-TE'> and several other glyphs appear to be out of order. For example, the prepositional phrase *ta tzih* ‘for unripe/raw/uncooked’ usually occurs after *yuk'ib* ‘his/her/its drinking cup’ but occurs before it here. It is a question whether the peculiar word order of this text is due to a poorly trained scribe or a novel poetic structure.

Example (6.8) also demonstrates a unique usage of *tee'eel* ‘orchard’:
In example (6.8), *tee'eel* ‘orchard’ may get special emphasis through the use of *tee'eel* ‘orchard’ twice, highlighting the importance of modifying *kakaw* ‘cacao’ with *tee'eel* ‘orchard’. However, similar problems to example (6.7) occur with this vase. The reading provided by Mora-Marín (2004b) is tentative, who has recently suggested that the scribe was not proficient, or the vase may have been repainted in modern times (Mora-Marín 2020 personal communication).

Examples (6.9) and (6.10) provide contexts that may have prompted *tee'eel* ‘orchard’ to be recontextualized at Palenque to be used with *ch'ok* ‘unripe, youth, heir’. Example (6.9) is of a polychrome pottery vessel from the Late Classic:
In example (6.9), the title *ch'ok* ‘unripe, youth, heir’ is a direct object of the verb *k'alaj* ‘was wrapped’ and labeled as *tzih(il)* ‘unripe, raw, uncooked’. Though this study does not gloss the verb *k'al* ‘to wrap’ as having a meaning of ‘dedication’, its use is important since it also takes material objects as grammatical objects. Moreover, Mora-Marín (2004) argues that this vase, along with others, demonstrate that there is a ‘similar treatment of dedicated objects and people’ with *tzih(il)* ‘unripe/raw/uncooked’ routinely modifying *kakaw* ‘cacao’. (See Mora-Marín (2004b:29) for more details). Relevant here is that the title *ch'ok* ‘unripe, youth, heir’ is being treated similarly to foodstuff and that *tee'eel* ‘orchard’, like *tzih(il)* ‘unripe, raw, uncooked’, routinely modifies *kakaw* ‘cacao’. This context of use could have expanded *tee'eel* ‘orchard’ to directly modify the title *ch'ok* ‘unripe, youth, heir’ at Palenque just like with *tzih(il)* ‘unripe, raw, uncooked’.

(6.9)

<table>
<thead>
<tr>
<th>K'AL-ja</th>
<th>tzi-hi-li</th>
<th>ch'o-ko</th>
<th>'IX/na</th>
<th>'u-tz'i-yi</th>
</tr>
</thead>
<tbody>
<tr>
<td>k'ajalaj∅</td>
<td>tzih-il</td>
<td>ch'ok</td>
<td>'ix</td>
<td>?</td>
</tr>
<tr>
<td>to.wrap/to.complete-PSV-3SG.ABS</td>
<td>unripe/raw/uncooked-VL</td>
<td>unripe/youth/heir</td>
<td>FEM</td>
<td></td>
</tr>
<tr>
<td>li-ta</td>
<td>b'a/JOL</td>
<td>?-?</td>
<td>?ta</td>
<td>?na</td>
</tr>
<tr>
<td>?</td>
<td>b'ah/jol</td>
<td>?</td>
<td>ta?</td>
<td>?</td>
</tr>
<tr>
<td>?</td>
<td>head</td>
<td>?</td>
<td>PREP</td>
<td>?</td>
</tr>
<tr>
<td>?k'i-b'i-?ni</td>
<td>?ta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>ta?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>PREP</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

‘It was wrapped, unripe/raw/uncooked heir, ……?’

(Photography by Kerr (n.d.-b: K4550); digital image courtesy of Justin Kerr; cropped by author; transliteration courtesy of Mora-Marín (2004b).
Finally, example (6.10) is an Early Classic carved or incised pottery vessel discussed in chapter 5, showing a visual depiction of the metaphor RULERS ARE TREES:

(6.10)

Example (6.10) does not attest tee'eel ‘orchard’ but has a similar phrase to that in the PSS, here, nal/'ixiim tee' ch'ok ‘maize tree heir’. Normally in the PSS, nal/'ixiim tee’ ‘maize tree’ modifies
kakaw ‘cacao’ which the holder of the title ch’ok ‘unripe, youth, heir’ possesses. In example (6.10), the phrase nal/iixiim tee’ ‘maize tree’ modifies the title ch’ok ‘unripe, youth, heir’ directly. Additionally, in the pictorial image, the maize god, or the heir who impersonates him, has cacao pods growing from his body though. Mora-Marín (2005:9) also notes that this instance may refer to the Ch’ol deity ſna’al ‘the god of abundance of plants and animals’. Perhaps this visual manifestation also prompted part of the enregisterment of the PSS associating nal/iixiim tee'eel ‘maize tree orchard’ with kakaw ‘cacao’ that was later reinterpreted at Palenque.

5.2 Reconfiguration, Recontextualization, and Enregisterment at Palenque

Uses of tee'eel ‘orchard’ strongly suggest it was evaluative and its role in positively evaluating the possessions of elites was increasing, sometimes extending to directly evaluate the elites themselves. Uses of tee'eel ‘orchard’ as an indexical were likely just beginning to be reconfigured and it is not clear if a full semantic shift is present on any of the vases with the Primary Standard Sequence. It is also, therefore, not clear if uses of tee'eel ‘orchard’ were beginning to be interpreted metaphorically, or were merely associated with elites, commonly referenced in the same contexts. At Palenque, however, there is direct use of tee'eel ‘orchard, lineage’ with ch'ok ‘unripe, youth, heir’ as seen in example (6.11), repeated from (4.7) in chapter 4:
In chapter 4, it was also noted that *tee'eel* ‘orchard, lineage’ was used with noun incorporation to describe a change of state to hold the title *ch'ok* ‘unripe, youth, heir’. This is seen in example (6.12), repeated from (4.20) in chapter four:

(6.12)

\[
\begin{array}{|l|}
\hline
62 \\
\hline
\begin{array}{l}
\textbf{YUWAL-'OCH-TE'-ja} \\
yuuwal 'ooch-tee'-aj-∅ \\
\text{and.then to.enter-tree-INTR-3SG.ABS} \\
\end{array} \\
\hline
\end{array}
\]

‘And then, he orchard-entered’ / ‘And then, they became part of the lineage’

(Temple of the Sun, glyph block Q13, Palenque; drawing by Linda Schele © David Schele (2000:SD-171); photo courtesy of Ancient Americas at LACMA (ancientamericas.org); cropped by author; transliteration courtesy of *The Maya Hieroglyphic Database Project*).

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62 Though this drawing is done by Linda Schele, Merle Greene Robertson’s (1991: figure 95) version shows a conflation of T765/AP5 with a logograph for *<TE>* ‘tree’ through the use of the ‘tree’ classifier that consists of a line and two semi-circles, discussed in chapter (2). This semantic classifier is placed at the top of the jaw of T765/AP5.
These uses are metaphorical, as argued for in chapter 4, and show that uses of tee’eel ‘orchard’ were reconfigured as an indexical at Palenque.

Uses of tee’eel ‘orchard, lineage’ at Palenque also provide evidence of a full recontextualization of the PSS, being used in a lengthy narrative context on monumental architecture. Recontextualization is defined as when a text or speech event is retold in another context, retaining only features of the original text that fit the new context (Bauman & Briggs 1990; Silverstein & Urban 1996; Wortham & Reyes 2015). In this case, the association of tee’eel ‘orchard’ with ch’ok ‘unripe, youth, heir’ is retained, but is altered so that tee’eel ‘orchard’ directly modifies ch’ok ‘unripe, youth, heir’. In this, the meaning of tee’eel ‘orchard’ is extended metaphorically to mean ‘lineage’. This fit the new context of monumental architecture that emphasized establishing the descent lines of rulers.

This recontextualization likely occurred from a common process in semantic change where metonymies evolve into metaphors when they become recontextualized (Lakoff & Johnson 1980; Barcelona 2012; Kövecses 2013). As noted in chapter 3, metonymies are another conceptual relation, but only involve one semantic domain (Lakoff & Johnson 1980). Metonymies point to a semantic domain by highlighting one element from it (Lakoff & Johnson 1980). When metonymies are used outside of their normal context they can be applied to new semantic domains, and thus create new metaphors (Lakoff & Johnson 1980; Barcelona 2012; Kövecses 2013). In this case, since tee’eel ‘orchard’ was strongly evaluative of whatever rituals were occurring with the uses of vases it was written on, it is easy to see how it could come to stand for that entire social context. When tee’eel ‘orchard’ was displaced to be used in a new context on monumental architecture at Palenque, it was used metaphorically by gaining the additional sense of ‘lineage’.
This recontextualization of *tee'eel* ‘orchard’ was also likely encouraged by other vases which depicted the metaphor in pictorial images. Ceramic phases at Palenque show influence from other Mayan areas (Rands & Rands 1957; Stuart & Stuart 2008). By 400 A.D. in the Early Classic, pottery from the Petén region to the east is seen at Palenque and by the seventh century A.D. in the Late Classic, a variety of local ceramic styles are found alongside imported polychromes, like the vast majority of vases that contain the PSS (Rands & Rands 1957; Stuart & Stuart 2008). By the eight century A.D., when examples of *tee'eel* ‘orchard, lineage’ are seen at Palenque, a new ceramic stage begins with an increase in very elaborate local wares, including incense burners and flanged cylinders with portraits of deities. Unfortunately, many of the decorations on vases of this style have deteriorated given the humid climate of Palenque (Stuart & Stuart 2008). Further, most vases with the PSS are also unprovenanced because of looting. Though there are only four clear examples of the visual depiction of the metaphor on vases, this history leaves open the possibility more will be found and shows that Palenque was importing such vases with the PSS from other Mayan areas. There is no denying the visual similarity of the metaphor as depicted at Palenque on monumental architecture with that depicted on vases.

Interestingly though, none of these vases mention *tee'eel* ‘orchard’ or necessarily have the PSS at all. Figures (5.6-5.7) (K6547) from chapter 5 is an Early Classic example with a PSS that mentions *kakaw* ‘cacao’ but not *tee'eel* ‘orchard’ and depicts rulers as various kinds of trees. Figure (5.5) (K4331) from chapter 5, presented in example (6.10) in the previous section, is also an Early Classic example that has the PSS and mentions *nal/iixiim tee’?ch’o* ‘maize tree heir?’ but does not explicitly mention *tee'eel* ‘orchard’. Figure (5.5) (K4331) also depicts the maize god, or a ruler impersonating him, with cacao pods. Figure (5.9) (K5616) and figure (5.8) (K631) from chapter 5 do not have the PSS at all, though explicitly depict cacao trees with humanoid
features. Both figures (5.6-5.7) (K6547) and figure (5.8) (K631) from chapter 5 are tripod vessels with legs and figure (5.7) (K6547) and figure (5.5) (K4331) from chapter 5 are carved and incised, all of which rarely occur with *tee'eel* ‘orchard’. Most vessels with *tee'eel* ‘orchard’ are painted varieties.

The visual depiction of the metaphor thus crossed media, from vases to monumental architecture at Palenque, and likely crossed modalities to encourage the reinterpretation of *tee'eel* ‘orchard’ as ‘lineage’ at Palenque. This makes sense given that a process of ‘graphic convergence’ is attested in Mayan hieroglyphic texts, as noted by Mora-Marín (2020). Specifically, Mora-Marín (2020) has documented the graphic convergence of the <CHAK> logogram with the <ko> syllabogram when in the phrase <CHAK[ko]-ch'o> *chak ch'ok* ‘red/great heir’ in the PSS. This process is relevant to understanding changes in usages surrounding uses of *ch'ok* ‘unripe, youth, heir’ in general. Further, as noted in chapter 2, parallelism, both verbal and visual, is part of Mayan hieroglyphic poetic traditions (Bassie-Sweet & Hopkins 2018; Hull & Carrasco 2012; Hull 2003; Josserand 1991; Tedlock 2010). In all these cases, visual and verbal forms are partially copied or converge based on other examples from similar visual or verbal contexts.

The recontextualization of *tee'eel* ‘orchard’ to have the sense of ‘lineage’ at Palenque likely contributed to the distinct register spoken at Palenque. As noted in chapter 4, historical linguistic evidence shows that the contemporary Mayan language most associated with Palenque, Ch'ol, is the only one of the Ch'olan Mayan languages to explicitly evidence both the semantic senses of ‘orchard’ and ‘lineage’ for *tee'eel*. Other Ch'olan languages only attest some evidence of sound and semantic similarities for the words for ‘tree’, ‘forest’ and ‘grandparents’ as seen in table (6.11), repeated from table (4.6) in chapter 4:

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Speech of this kind may have marked Palenque as having a distinct identity from other Mayan polities. Specifically, Mora-Marín with Wiesen (2019) note that the –(VVl)Vl form of the abstractive suffix was innovative in the Late Classic and possibly originated in Proto-Western-Ch'olan, the branch of the Ch'olan language family that would eventually split into the languages Yokot'an (Chontal) and Ch'ol. Additionally, there is evidence of other dialect and register differences coming from Palenque at this time with the use of the innovative -wan positional verb marker, in contrast to the conservative -laj allomorph (Hruby & Child 2004; Law & Stuart 2017; Mora-Marín with Wiesen 2019).

The history of Palenque is unlike many of its neighbors and helps contextualize and explain these findings. Large monumental architecture is seen in the east in the Petén by 300 B.C., while none is seen at Palenque at this time in the west, suggesting that most of the

<table>
<thead>
<tr>
<th>Language</th>
<th>‘tree’</th>
<th>‘forest’</th>
<th>‘grandparents’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch'orti'</td>
<td>‘tree, wood, stick’</td>
<td>‘forest’</td>
<td>‘grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>‘grandmother’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Note: nuk ‘big’)</td>
</tr>
<tr>
<td>Yokot'an (Chontal)</td>
<td>‘tree, wood, stick’</td>
<td>‘jungle, forest, branch’</td>
<td>‘grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>‘grandmother’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>‘grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>‘grandmother’</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(Note: noj ‘big’, pap ‘father’)</td>
</tr>
<tr>
<td>Ch'ol</td>
<td>‘tree, wood, stick’</td>
<td>‘small forest’</td>
<td>‘paternal grandfather’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>‘grandmother’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Note: Sabanilla dialect only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘forest’</td>
<td>‘grandfather, grandparents’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Note: noj ‘big’, te’el ‘forest’)</td>
</tr>
<tr>
<td>Colonial Ch'ol</td>
<td>‘tree, wood’</td>
<td>‘forest’</td>
<td>‘grandfather, grandparents’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Note: noj ‘big’, te’el ‘forest’)</td>
</tr>
</tbody>
</table>

innovations of hieroglyphic writing, iconography, temples, and monumental art spread to the western areas from here (Stuart & Stuart 2008). In fact, Palenque’s history is unclear to scholars until well in the Early Classic period in the sixth century A.D., while other polities had established written histories at this time (Stuart & Stuart 2008). At the beginning of the seventh century A.D., Palenque was well established enough to be part of wider regional politics, being attacked by the much more powerful site of Calakmul and its allies (Carrasco 2012; Stuart & Stuart 2008). Also, at this time, more sites began to grow and exert their power, increasing competition and warfare (Carrasco 2012; Stuart & Stuart 2008).

During this period, the rulers of Palenque increased the size and number of buildings and monumental art, making some of the longest known narratives in the Mayan region (Carrasco 2012; Stuart & Stuart 2008). As discussed in chapters 4 and 5, at Palenque, examples of the metaphor RULERS ARE TREES first appear in art on the ruler K'inich Janab Pakal’s tomb and then in texts in a series of connected temples, the Cross Group. The Cross Group texts elaborately relate the dealings of deities and ancestors with those of K'inich Janab Pakal’s son, K'inich Kan Bahlam, through parallel verse, weaving both the past with the present of the text (Carrasco 2012; Tedlock 2012). K'inich Kan Bahlam was coming to power and being designated as heir. Since earlier records of Palenque are unclear, it is not certain what part of this text is myth or history (Stuart & Stuart 2008). Further, such mythic descriptions and depictions are rare in monumental architecture (Carrasco 2012). Emphasis on K'inich Kan Bahlam’s connection to his father may be a product of a unique system of rulership (Stuart & Stuart 2008). Though previous analyses by Schele and Friedel (1990) suggest that Palenque’s atypical rule was based on matrilineal descent, Stuart and Stuart (2008) suggest that unlike other areas of the Mayan region, rule at Palenque was not just based on descent – matrilineal or patrilineal (Stuart & Stuart 2008).
For example, K’inich Kan Bahlam’s brother ruled after K’inich Kan Bahlam, and thereafter their nephew ruled (Stuart & Stuart 2008). Establishing who had the title of *ch’ok* ‘unripe, youth, heir’ must have been essential to maintain rule (Stuart & Stuart 2008). Further, Carrasco (2012) argues that the effects of warfare, including the desecration of temples, and elites’ abilities to restore and sanctify these temples through ritual, was highlighted in many texts at Palenque. This makes sense because maintaining rule would have been essential in the Late Classic with increasing warfare and competition. In fact, Munson and Macri (2009) have demonstrated that increased kinship statements correlate with decentralized political networks in the Late Classic, which were the product of such competition. Additionally, Munson et al. (2016) have hypothesized that variation in accession rituals, such as discussed for the Cross Group texts, may be due to such competition.

5.3 Summary

A Bakhtinian style of discourse analysis as developed by Wortham and Reyes (2015) and a multimodal discourse analysis were done to demonstrate how *tee’eel* ‘orchard’ was configured and reconfigured as an indexical, which contributed to the general enregisterment of the PSS. This was done in complement to the corpus analysis done in section (4), where word association measures were run for *tee’eel* ‘orchard’ and *ch’ok* ‘unripe, youth, heir’. Word associations measure presumed linguistic context, similarly to indexicals, which are configured jointly in processes of enregisterment. This discourse analysis across texts was done to establish how the meaning of *tee’eel* ‘orchard’ shifted metaphorically to mean ‘lineage’. This shift was encouraged by visual depictions of the metaphor *RULERS ARE TREES* on other vases, which did not necessarily mention *tee’eel* ‘orchard’ in writing but had a similar social context of use in political rituals. The
metaphor thus crossed modalities and media to be used in monumental architecture at Palenque. Graphic convergence and parallelism attest to the influence of the visual and verbal modalities on each other. The semantic shift of *tee'eel* ‘orchard’ to ‘lineage’ also demonstrates a common semantic change from metonymy to metaphor. This change was generally part of the process of re-enregisterment at Palenque in which other distinct grammatical forms were used and exhibited socio-political context with irregular descent patterns where heirs needed to be justified.

6 Conclusion

In conclusion, Palenque reinterpreted presumably literal language in the PSS in light of visual metaphors on vases to be used in novel linguistic metaphors on monumental architecture. The shifting meanings of these vases across modalities and media were prompted by the socio-historic context of their uses in changing political climates. Vases were used as part of ritual gift exchanges in feasting events amongst political elites at the end of the Late Classic period in which there was increasing political competition and shifting regional power networks. Additionally, the linguistic context and literary traditions behind these texts prompted the shifting meaning of these vases. A corpus linguistic analysis of collocates and n-grams of *tee'eel* ‘orchard’ and *ch'ok* ‘unripe, youth, heir’ that occur in the unique metaphorical constructions at Palenque provided an analysis of this linguistic context by providing statistical measures of word associations. The corpus analysis demonstrated an association of the two words but that they never occurred adjacent to each other. Additionally, the corpus analysis of *tee'eel* ‘orchard’ and *ch'ok* ‘unripe, youth, heir’ showed word associations not only with terms for foodstuffs but, also terms venerating those with the title *ch'ok* ‘unripe, youth, heir’. A Bakhtinian style of discourse analysis as outlined by Wortham and Reyes (2015) and a multimodal discourse analysis
showcased several examples in which *tee'eel* ‘orchard’ was used in novel ways. These examples suggested that the meaning of *tee'eel* ‘orchard’ was slowly shifting through its reconfiguration as an indexical before it was finally completely recontextualized to be used on monumental architecture at Palenque. This linguistic context allowed for the vocabulary of the PSS, specifically *tee'eel* ‘orchard’, to become metonymic for the entire socio-historic context of use of these vases. This metonymy could then easily shift metaphorically, with metonymy being a common basis of many metaphors. Further, a discursive tradition of visual and verbal parallelism and graphic convergence of routinely co-occurring signs encouraged the meanings to shift across modalities and media. The metaphoric shift exhibited at Palenque was part of a wider process of enregisterment and grammatical change at Palenque and the surrounding areas at the end of the Late Classic period.
Chapter 7 – Multimodal Meaning

This study aimed to document metaphor variation across different modalities, media, places, and times, in Mayan hieroglyphic texts, something which has been understudied to date. Mayan hieroglyphic texts provided a unique case to document such variation because of the communicative affordances provided by their complex multimodality. Communicative affordances consist of what is possible to express in a given modality or medium given its physical properties and the socio-historic context that contributes to its signification (Kress & Leeuwen 2010: 215–217). Specifically, the communicative affordances of the modalities of writing and pictorial images were complementary in these texts, with each modality capable of expanding upon or expressing what remained unexpressed in the other. Further, the communicative affordances of different Mayan hieroglyphic media were not just based on the typical information they contained, but their role in politics, Mayan cosmology, and accompanying rituals. These texts thus provided ritual and political power themselves, with possession of objects with hieroglyphic texts officializing political and cosmologically oriented performances. Given these affordances, Mayan hieroglyphic texts also provide a key example of the role of metaphor variation in political framing.

Through documentation of metaphor variation this study also aimed to examine the materiality of metaphor, that is, the specific material forms metaphor takes and their effects on semantic structure. This was done despite adopting an adapted conceptual definition of metaphor from Conceptual Metaphor Theory where metaphor is defined as, the use of one semantic domain, or concept, to provide semantic structure for another (Lakoff & Johnson 1980). A
conceptual definition was adopted because it allows for a single metaphor to underly various
materializations, and thus for an account of metaphor variation. However, some conceptual
approaches, like Conceptual Metaphor Theory (Lakoff & Johnson 1980), have undertreated
metaphor variation, leading to universalizing claims about metaphorical structure and a lack of
systematic methodological procedures. This study thus challenged key claims of Conceptual
Metaphor Theory regarding the role of material forms in metaphor analyses and the universality
of metaphorical structures across languages, cultures, and time periods.

To remedy the methodological shortcomings of a strictly conceptual approach, this study
used a mixed-methods approach that integrated corpus linguistics and discourse analysis that
could systematically document metaphor variation across variables in their discursive context.
Corpus approaches were used because they are effective for reviewing large bodies of data
through providing big picture statistics and explicit criteria for searching for and identifying
metaphors. This study specifically used a Bakhtinian approach to discourse analysis as outlined
by Wortham and Reyes (2015) because it can analyze metaphor use across different texts in its
discursive and historical context as this use evolves and changes. This approach to discourse
analysis is also useful because it traces how texts and their linguistic patterns become associated
with certain social meanings and social identities as they are repeated, reified, and changed.
Thus, this approach helped document the social role of metaphor in linguistic framing in Mayan
hieroglyphic texts. This study also analyzed how pictorial images coupled with such discursive
patterns, given the multimodal quality of these texts.

This study’s aims were accomplished through an examination of the variation of the
RULERS ARE TREES metaphor in Mayan hieroglyphic texts as it materialized across the modalities
of writing and pictorial images, the different media of monumental architecture, portable objects,
and codices, different places or polities, and different times (Early (250-599 A.D.) to Late Classic (600-900/1100 A.D.) periods. The RULERS ARE TREES metaphor demonstrated the use of the semantic domain of TREES to provide semantic structure to the semantic domain of RULERS. This metaphor is based on the use of trees and other plants in political symbolism that has long been noted by Mayanist scholars who have argued that much of pre-Columbian Mayan political power rested in elites’ control of and relationship to agriculture. However, a previous discourse analysis done by the author showed novel uses of the metaphor RULERS ARE TREES from a small set of multimodal texts from the Cross Group monuments at the site of Palenque, in Chiapas, Mexico unexamined by other scholars. Occurring in the Late Classic (600-900/1100 AD), these examples had the potential for elucidating the relationship between political rhetoric, particularly, political metaphor, and changing political climates. During this time, a proliferation of hieroglyphic texts was an integral part of increased political competition between an ever-growing number of smaller polities (Munson and Macri 2009; Munson et al 2016). Additionally, this study contributes to research on the use of plant symbolism in Mayan hieroglyphic texts by detailing several examples where rulers are directly described and depicted as having attributes of trees and other plant life.

This study demonstrated that the political metaphor RULERS ARE TREES materialized distinctly in the modalities of writing and pictorial images, and expressed differently through complementary semantic structures, based on the modality in which the metaphor was expressed in. The occurrence of the metaphor also varied across different media, places, and times. In writing, the metaphor was found to materialize by using distinct grammatical constructions through either elaborating the meaning of the metaphor, or, in contrast to their nonmetaphorical counterparts. Specifically, this study demonstrated that the abstractive suffix –(VVl)VVl, which
derives abstract nouns from other nouns and adjectives, and constructions with noun incorporation, were used with the metaphor. The use of the abstractive suffix –(VV)VV was shown to be used with the metaphor because of its grammatical function. The grammatical function of the abstractive suffix –(VV)VV, when applied in a novel context to a different domain, extended the meaning of the word root to have a metaphorical sense, specifically deriving a meaning ‘of lineage’ from the semantic sense of ‘tree’. Noun incorporation was used with metaphorical constructions more often than their nonmetaphorical counterparts. The use of specific grammatical forms in metaphorical constructions in contrast to their use in nonmetaphorical constructions is in line with other corpus research on metaphor and grammar (e.g. Deignan 2005). Further, this finding may be the result of the genre features of Mayan hieroglyphic texts that frequently use noun incorporated verbs (Hull 2009).

The semantic structure of the metaphor when expressed in writing evidenced two models with different sets of metaphorical entailments. One model described a lineage of rulers as an orchard, with each ruler being a single tree. The other model described a lineage of rulers as a single tree, with each ruler corresponding to a tree part. The written modality also afforded the semantic structure the ability to not materialize elaborately, or explicitly detail every aspect of the metaphor. This was perhaps due to the formulaic nature of Mayan hieroglyphic textual genres. The metaphor was not fully elaborated in terms of the vocabulary used, the semantic entities and processes it described, and the metaphorical reasoning it evidenced. Given this, the semantic structure was also shown to not be fully elaborated because the modality of writing afforded that the metaphor could be expressed coherently, rather than compositionally. With compositionality, the semantic elements of each semantic domain in a metaphor are analogically equivalent with each other, mapping in a one-to-one correspondence. With coherence, the
semantic structure of a metaphor simply does not have contradicting parts and merely shares various elements or knowledge between domains. Coherence allows a metaphor to not be fully elaborated and indeterminate, but acceptable if the metaphor is coherent with other uses of the metaphor and knowledge of the semantic domains used in the metaphor.

In contrast, the metaphor materialized in pictorial images through superimposition or fusion of trees and rulers – specifically of their various anatomical parts. Which human body parts and plant parts were superimposed or fused did not necessarily match the visual relationships, or image schemas, expressed by polysemous body part and plant part vocabulary in Ch'olan languages. Such language was not attested in examples of the metaphor in writing. Additionally, which human body parts and plant parts were superimposed or fused was variable across examples.

This variation was ultimately due to what semantic structures of the metaphor were afforded to be expressed by the modality of pictorial images. Specifically, the variation may result from the visual metaphor not only expressing physical attributes shared between rulers and trees but, similar processes in the life cycle of a ruler and that of a tree. Depicting processes in static images may have necessitated this variation, capturing different moments of a ruler’s or tree’s life. Variation in the visual expression of the metaphor is also due to representing one of the two models of the metaphor that were evidenced in the modality of writing. The modality of pictorial images afforded that the semantic structure must be fully elaborated, and thus compositionally expressed. In examples in pictorial images, exactly how each element of a domain relates to the other is fully expressed by fully depicting precisely in what ways a ruler is like a tree.
This study also traced this metaphor variation in the modalities of writing and pictorial images across different media, time periods, and places. In writing, the metaphor only occurred in monumental architecture in the Late Classic period, with the few instances of the metaphor in writing occurring at Palenque first. The few instances of the metaphor in pictorial images also mainly occurred on vases, ranging from the Early to Late Classic periods. A few instances were found on monumental architecture, but these only occurred at Palenque during the Late Classic. The lexical items used in metaphorical constructions in writing were also found to be used in nonmetaphorical constructions, but these instances were only found on vases. However, these nonmetaphorical uses of lexical items did not occur on vases that also demonstrated the visual metaphor.

The variation of the metaphor across modalities, media, times, and places can be explained as a metaphoric shift. Nonmetaphorical uses on vases in writing were reinterpreted metaphorically in light of visual metaphors on other vases, at Palenque. Specifically, derivational morphology of the abstractive suffix –(VVl)VVl that was used in nonmetaphorical constructions began to be used in metaphorical ones via semantic extension that was metaphorically based. This new interpretation then traveled to be used on different media in monumental architecture, that expressed the metaphor both the modalities of writing and pictorial images. This metaphorical shift thus occurred across modalities and media.

This study argued that this metaphoric shift occurred due to the discursive affordances provided by the socio-cultural and historical contexts of private political ceremonies amongst elites where valuable vases were exchanged. This process was demonstrated through a collocate and n-gram analysis of writing on vases. These analyses showed a statistical association of key vocabulary that is also used in metaphorical constructions on monumental architecture. How
these statistical associations led to metaphoric shift was demonstrated through using a Bakhtinian style discourse analysis that contextualized the social action behind, and interpretations of, the discourse on such vases as they traveled across texts. This metaphoric reinterpretation was also part of a wider process of linguistic change, where distinct social dialects were emerging in correspondence to shifting political alliances at the end of the Late Classic (600-900/1100 AD). Part of this process of change was morphologically based (Hruby & Child 2004; Kaufman & Norman (1984); Lacadena & Wichmann 2006; Mora-Marín with Wiesen 2019).

The variation of metaphor in Mayan hieroglyphic texts challenges some of Conceptual Metaphor Theory’s universalizing tendencies. In line with anthropological metaphor research, this study showed that metaphorical mappings will not necessarily be the same cross-culturally, even if the same source and target domains are be used. For example, English uses a similar conceptual metaphor where lineages are described in terms of trees, exemplified in phrases such as *family tree* and *the apple doesn’t fall far from the tree*. However, the semantic structure that is used from the source domain of *trees* is substantially different from that in Mayan hieroglyphic texts. The phrase *family tree* exemplifies a mapping where structural properties of trees, particularly branches and their divisions, are likened to descent patterns. The phrase *the apple doesn’t fall far from the tree* exemplifies a mapping where human reproduction is likened to agriculture by the tree itself being likened to a parent and the offspring to the tree’s produce. Neither of these mappings was seen in examples in this study. Instead, one model of the metaphor *RULERS ARE TREES* likened lineages to an entire orchard and individual rulers to individual trees. In the other model, lineages are likened to a single tree with ancestors likened to tree roots and in other cases a tree’s produce. The first model was based on the role of orchards in inherited wealth in pre-Columbian Mayan society. The second model was based on the pre-
Columbian Mayan concept that ancestors provided sustenance for future generations. As discussed in chapters (2) and (5), Knowlton and Vail (2010) similarly noted differences in pre-Columbian Mayan uses of ‘world trees’ from that in colonial Spain.

Such documentation of metaphor variation also challenges Conceptual Metaphor Theory’s claims that knowledge of source domains is based on universal biological experiences, given that examples in Mayan hieroglyphic texts and English showed different knowledge and use of the same source domain TREES (Lakoff & Johnson 1980:22-24). Additionally, this documentation challenges Conceptual Metaphor Theory’s invariance principle that claims as much information from the source domain that is coherent with the target domain is transferred in metaphorical processing (Lakoff 1993:215-216). Clearly, culturally distinct models using the same source and target domains use different mappings and do not map all that might be consistent between domains.

This study also challenges the claim that there is no role for the materiality of metaphor, or metaphor form, in understanding metaphor, counter to Conceptual Metaphor Theory. First, it was shown, that in line with other corpus research on metaphor and grammar (e.g. Deignan 2008), that verbal or written metaphors can take a distinct grammatical shape, such as certain morphological or syntactic forms, more often than their nonmetaphorical counterparts. It was also shown that these grammatical forms can play a direct role in the creation of metaphorical meaning, with the abstractive suffix \((VV)VV\) enabling a metaphoric shift. Further, it was shown that the modality in which a metaphor is expressed affects its semantic structure, in accordance with other work on multimodal metaphor (e.g. Forceville 1996, 2009, 2017). In writing, the metaphor was not expressed elaborately, and examples were merely coherent, or
non-contradictory, with other examples. In pictorial images, the metaphor showed an elaborated structure, where mappings in each example were expressed compositionally.

This study thus also challenges a key tenet of Conceptual Metaphor Theory where it is assumed that the semantic structure of a metaphor will be elaborated and compositional. Though Conceptual Metaphor Theory’s invariance principle claims to be based on coherency, in reality, mappings of the semantic structure in a metaphor are diagrammed in an analogical fashion, showing fully elaborated sets of one-to-one correspondences. However, it was also demonstrated that the principle of metaphorical asymmetry, noted by Conceptual Metaphor Theory and other scholars (e.g. Ortony 1979), holds regardless of the modality a metaphor is expressed in. This principle contends that metaphorical sources unidirectionally transfer metaphorical structure to targets unless there is a substantial change in meaning (Lakoff & Johnson 1980; Ortony 1979). This study demonstrated that visual metaphors exemplify the principle of asymmetry despite not having a linear order, as is the case in language and writing where source and target domains typically occupy distinct positions. This study demonstrated this by showing that visual metaphors show different semantic properties if the source and target domains were reversed. This result is in line with Conceptual Metaphor Theory, work on visual metaphors, and other approaches to metaphor (Lakoff & Johnson 1980; Ortony 1979; Indurkhya and Ojha 2017).

This study also showed that there is metaphor variation across media, in line with metaphor research on discourse and genre (e.g. Charteris Black 2012; Deignan et al 2019). This variation across media was due to a given medium’s communicative affordances based on its socio-cultural and historic context of use. Particularly, various hieroglyphic media afforded different opportunities for political framing. For example, this study demonstrated that monumental architecture afforded the most explicit form to officialize and frame political power.
and this is where novel political metaphorical constructions were found. This study’s results thus contrast with Conceptual Metaphor Theory that denies any role for discursive context or genre in understanding metaphor use.

Additionally, some historical research on metaphor has begun considering the discursive, socio-cultural, and historic contexts of use that have afforded metaphoric shift, though this study’s mixed-method approach has provided more detailed insight into this process (e.g. Wiseman 2007). Specifically, this study demonstrated how discursive, socio-cultural, and historic contexts allowed for metonymy to play a key role in the development of metaphor shift. Metonymy has been noted as one of the key drivers in the creation of new metaphors (Kövecses 2013). This study thus contextualized in which specific discursive contexts linguistic change occurs, when traditionally such contexts are not always available for historical linguistic analyses. The results of this study also demonstrated that metaphor could play a clear role in the process of linguistic change, in line with other historical linguistic research on metaphor (e.g. Sweetser 1991; Hollenbach 1995). Particularly, it was demonstrated how metaphor can play a role in the emergence of distinct social dialects, specifically through carrying out derivational change. This study thus directly contributes to the understanding of the evolution of the abstractive suffix –(VVl)VVl in Ch'olan languages. In consequence, this study also provides insight into understanding the Primary Standard Sequence on Mayan hieroglyphic vases that exemplified such uses of the abstractive suffix –(VVl)VVl and in other hieroglyphic media.

Finally, this study has wide significance for research on how communicative technologies aid in the creation and change of cultural and political meaning alongside grammatical change, by providing a relevant historical example. Though pre-Columbian Mayan writing is an early, rather than a new, medium, examining such early communicative technology helps us better
understand the rapid shifts in communication and subsequent political processes, occurring
today. Early media were subject to such social processes and are also complexly multimodal,
using both written texts and pictorial images in communication, like many multimodal media
platforms today. Thus, this study contributes to understanding multimodal meaning in general.
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———. n.d. *Site Q, Ball Player Panel 4*.

———. n.d. *Site Q, Ball Player Panel 5*.

———. n.d. *Site Q, Stela 4*.

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## APPENDIX A – SOURCES & DATA SAMPLED FOR PICTORIAL IMAGES

<table>
<thead>
<tr>
<th>Media Type</th>
<th>Region</th>
<th>Site &amp; # of Pictorial Images Examined</th>
<th>Sample Items and Sources</th>
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<tbody>
<tr>
<td>Monumental Architecture (excluding murals) (66 sites; 833 pictorial images)</td>
<td>Yucatán (11 sites; 188 pictorial images)</td>
<td>Chichén Itzá (63 pictorial images)</td>
<td><em>The Linda Schele Drawings Collection</em> (Schele 2000): warriors column 60, ballcourt south building chacmool, warriors substructure north bench, great ball court, upper temple of the jaguars, southwest panel, warriors exterior north wall, warriors entrance façade, warriors column 40, structure 6E1 south column, great ball court lower temple of the jaguar column, great ball court upper temple of the jaguars north panel, great ball court alley bench skull ball, great ball court lower temple of the jaguar register D-E, great ball court upper temple of the jaguars lintel, warriors column 37, warriors column 17, la iglesia skyband, great ball court south building west end panels, great ball court upper temple of the jaguars altar, great ball court upper temple of the jaguars inner entrance, great ball court upper temple of the jaguars northeast panel, great ball court lower temple of the jaguar column, great ball court lower temple of the jaguar south pier, great ball court lower temple of the jaguar north outer pier, great ball court north temple jamb, great ball court north temple west door jamb, great ball court north temple door jamb, great ball court north temple door jamb, great ball court upper temple of the jaguars Southwest panel, great ball court misc. 5055, great ball court south building pillar, great ball court lower temple of the jaguar south inner pillar, great ball court misc. 5058, misc 5059, misc 506, great ball court upper temple of the jaguars lintels, misc. 5063, misc. 5064, great ball court northwest panel, ball court lower</td>
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<td>Media Type</td>
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<tr>
<td>south panel, misc 5068</td>
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<td>great ball court upper temple of the jaguars southeast panel, misc. 5070, great ball court north temple north wall, misc. 5072, misc. 5074, misc. 5075, misc. 5076, misc. 5076, misc. 5078, misc. 5079, misc. 5080, misc. 5081, misc. 5083, misc. 5084</td>
<td>- Unknown artist: great ball court sculpture chamber E east roof, great ball court sculpture chamber E north wall, great ball court sculpture chamber E south wall, great ball court sculpture chamber E west wall, great ball court sculpture chamber E west roof, stela 2, south column of 6E1</td>
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<tr>
<td>Coba</td>
<td>(21 pictorial images)</td>
<td>• <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): stela 1-6, steal 8-13, stela 15-23</td>
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<tr>
<td>Uxmal</td>
<td>(26 pictorial images)</td>
<td>• <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): altar 1, capstone 1-2, capstone 5-6, misc. 76, monument 1, sculpture 1, stela 1-15, stela 17, step 1</td>
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<td>Xcalumkin</td>
<td>Petén</td>
<td>(42 pictorial images)</td>
<td>• <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): capital 1-5, column 1-6, cornice 1, jamb 1-9, lintel 1-4, misc. 5, panel 1-7</td>
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<td>Pixoy</td>
<td>Petén</td>
<td>(7 pictorial images)</td>
<td>• <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): misc. 1, panel 1-5</td>
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<td>Itzimite</td>
<td>Petén</td>
<td>(12 pictorial images)</td>
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<td>Dzibilchaltún</td>
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<td>(2 pictorial images)</td>
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<td>Yo'okop</td>
<td>Petén</td>
<td>(3 pictorial images)</td>
<td>• Johnstone in Shaw, Johnstone, and Krochock (2001): stela 1, stela 2, stela 3</td>
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<td>Ichpaatun</td>
<td>Petén</td>
<td>(1 pictorial image)</td>
<td>• Unknown artist: stela 1</td>
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<td>Loltun</td>
<td>Petén</td>
<td>(1 pictorial image)</td>
<td>• <em>The Linda Schele Drawings Collection</em> (Schele 2000): Loltun Cave</td>
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<td>Calakmul</td>
<td>Petén</td>
<td>(4 pictorial images)</td>
<td>• Unknown artist: stela 63</td>
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<td>• Grube in Eggebrecht et al (1992): stela 89</td>
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<td>• Martin &amp; Grube (2008): stela 51, stela 54</td>
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<td>El Peru</td>
<td>Petén</td>
<td>(7 pictorial images)</td>
<td>• Miller (Jeffrey) (n.d.) stela 33</td>
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<td>• Montgomery in Wanyerka (1996): stela 34</td>
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<td>• Graham in (Lee 2012):</td>
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<td>stela 31- 32</td>
<td>• Graham (n.d.): stela A, stela B, stela E</td>
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<td>El Zapote (1 pictorial image)</td>
<td>• <em>The Linda Schele Drawings Collection</em> (Schele 2000): stela 5</td>
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<td>El Zotz (3 pictorial images)</td>
<td>• Graham in Houston (2008): lower panel lintel 1, upper panel lintel 1, stela 1</td>
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<td>Ixlu (2 pictorial images)</td>
<td>• <em>The Linda Schele Drawings Collection</em> (Schele 2000): stela 2</td>
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<td>Jimbal (1 pictorial image)</td>
<td>• <em>The Linda Schele Drawings Collection</em> (Schele 2000): stela 1</td>
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<td>La Honradez (9 pictorial images)</td>
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<td>• Lolten in Reents-Budet (1988): stela 9</td>
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<td>Naranjo (45 pictorial images)</td>
<td>• <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): Altar 1, lintel 1, sculpture 1, stela 1-41</td>
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<td>Site Q (10 pictorial images)</td>
<td>• <em>The Linda Schele Drawings Collection</em> (Schele 2000): ball player panel 1, ball player panel 3, ball player panel 6, panel 6</td>
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<td>• Graham (n.d.): ball player panel 2, ball player panel 4-5, stela 4-6</td>
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| Tikal      |              | (25 pictorial images)                | • *The Linda Schele Drawings Collection* (Schele 2000): structure 5d 57 façade, structure 5d 1, altar 8, structure 5d 68 room 9 graffiti, stela 23, altar 5, stela 18, temple 4 lintel 3, stela 39, temple 2 lintel 1, stela 35, stela 31, stela 30, stela 26, temple 4 lintel 2, stela 29, stela 5  
• *The Montgomery Drawings Collection* (Montgomery 2000): temple 3, lintel 2  
• Martin and Grube (2008): stela 40, stela 16  
• W.R. Coe in Jones and Satterthwaite (1982): altar 20, temple 1 lintel 3, stela 19, stela 20 |
| Uaxactun   |              | (29 pictorial images)                | • *Corpus of Mayan Hieroglyphic Inscriptions* (Flash & Graham n.d.): altar 1, stela 1-10, stela 12-22 |
| Ucanal     |              | (7 pictorial images)                 | • *Corpus of Mayan Hieroglyphic Inscriptions* (Flash & Graham n.d.): altar 1, altar 3, stela 2-4, stela 6-7 |
| Xultun     |              | (25 pictorial images)                | • *Corpus of Mayan Hieroglyphic Inscriptions* (Flash & Graham n.d.): stela 1-10, stela 12-25 |
| Xunatunich |              | (4 pictorial images)                 | • Graham in Graham & von Euw (1978): altar 1, stela 1, stela 8  
• von Euw in Graham & von Euw (1978): stela 9 |
<p>| Yaxha      |              | (2 pictorial images)                 | • <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): stela 13, stela 31 |
| Southern Belize | Caracol | (17 pictorial images)                | • Beetz and Satterwaite (1981):       |</p>
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<td>(5 sites; 33 pictorial images)</td>
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<td>stela 1-5, stela 6 (two images), stela 11, stela 13-14, stela 16, stela 21, stela 31, altar 12, altar 13</td>
<td>• Chase, Grube, and Chase (1991): altar 23</td>
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<td>Ixkun</td>
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<td>(7 pictorial images)</td>
<td>• <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): altar 3, stela 1-5</td>
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<td>Mountain Cow</td>
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<td>(1 pictorial image)</td>
<td>• Grube in Grube &amp; Martin (2004): altar 1</td>
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<td>Pusilhá</td>
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<td>(4 pictorial images)</td>
<td>• <em>The Montgomery Drawings Collection</em> (Montgomery 2000): stela c, stela e, stela k, stela p</td>
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<td>Pasion Region</td>
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<td>Agua Calientes</td>
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<td>(1 pictorial image)</td>
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<td>Aguateca</td>
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<td>(6 pictorial images)</td>
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<td>Arroyo de Piedra</td>
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<td>(4 pictorial images)</td>
<td>• <em>Corpus of Mayan Hieroglyphic Inscriptions</em> (Flash &amp; Graham n.d.): stela 1, stela 3</td>
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<td>• Houston (1987): stela 2, stela 6</td>
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<td>Cancuén</td>
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<td>(2 pictorial images)</td>
<td>• <em>The Linda Schele Drawings Collection</em> (Schele 2000): ball court marker 1</td>
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<td>Dos Pilas</td>
<td>Western Region</td>
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<td>• Houston (1993): panel 10, stela 5, stela 10, stela 14-16, 3 stairs from hieroglyphic stairway 3</td>
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<td>El Caribe</td>
<td>Western Region</td>
<td>(2 pictorial images)</td>
<td>• Proskouriakoff (1950): stela 1-2</td>
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<td>El Chorro</td>
<td>Western Region</td>
<td>(1 pictorial image)</td>
<td>• Graham (n.d.): stela 1</td>
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<td>Western Region</td>
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<td>(1 pictorial image)</td>
<td>• Houston (1993): stela 5</td>
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<td>Bonampak</td>
<td>Western Region</td>
<td>(13 pictorial images)</td>
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<td>• Mathews (1980): lintel 1-3, stela 1-3</td>
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<td>• Corpus of Mayan Hieroglyphic Inscriptions (Flash &amp; Graham n.d.): sculpture stone 2</td>
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<td>• Safronov (n.d.) in Wayeb Drawing Archive: sculpture stone 5</td>
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<td>• Safronov (n.d.) in Wayeb Drawing Archive: ‘po’ panel</td>
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<td>Chinikihá</td>
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<td>• Stuart (n.d.) in <em>Dumbarton Oaks Research Collection</em>: panel</td>
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<td>Chinkultic</td>
<td>(8 pictorial images)</td>
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<td>• Earley (2020): monument 1, monument 7, monument 17-18, monument 21, monument 38</td>
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<td>• Prager (n.d.) in Earley (2020): monument fragment</td>
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<td>(1 pictorial image)</td>
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<td>• Graham (1970): stela 1, stela 7, stela 9</td>
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<td>La Mar</td>
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<td><strong>Teufel (n.d.): panel 3</strong></td>
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<td>Moral</td>
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<td><strong>Andrews (1943): stela 1</strong></td>
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<td><strong>Pavon Abreu (1945): stela 3</strong></td>
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<td><strong>Greene Robertson (1983): temple of the inscriptions – pier b, pier c, pier d, pier e, sarcophagus, stucco figure 1, stucco figure 3, stucco figure 5-9</strong></td>
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<td><strong>Greene Robertson (1985): early buildings of the palace – palace oval tablet, palace oval throne, eastern subterranean vault 2, western subterranean vault, house b southwestern room narrative scene, house c pier c-e, house c western corridor</strong></td>
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<td><strong>Greene Robertson (1986): late buildings of the palace – house a pier b-e, house d pier b-d, house d pier f, palace tablet, east court east side south of stairs figures, east court east side</strong></td>
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<td>north of stairs figures, east court west side figure 1-6, north palace substructure</td>
<td>• Greene Robertson (1991): cross group, the north group, olvidado, and other pieces – temple of the cross panel, figures 6-7 from the northeast niche of temple of the inscriptions, temple of the cross west jamb, temple of the cross east jamb, temple of the cross roof, temple of the sun east elevation, temple of the sun panel, temple of the sun south jamb, temple of the foliated cross panel, temple XIV tablet, tablet of the slaves, tablet of the scribe, tablet of the orator, tablet of temple XXI, creation stone</td>
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<td>• Stuart (1990): zapato panel, war panel</td>
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<td>• The Linda Schele Drawings Collection (Schele 2000): temple 17 main panel, Dumbarton Oaks panel 2, temple XXI figure with staff</td>
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<tr>
<td>Panhale</td>
<td>(1 pictorial image)</td>
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<td>• Von Euw in Corpus of Mayan Hieroglyphic Inscriptions (Flash &amp; Graham n.d.): stela 1</td>
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<td>Piedras Negras</td>
<td>(11 pictorial images)</td>
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<td>• Corpus of Mayan Hieroglyphic Inscriptions (Flash &amp; Graham n.d.): stela 1-11</td>
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<td>Pomona</td>
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<td>• The Linda Schele Drawings Collection (Schele 2000): panel 1</td>
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<td></td>
<td></td>
<td>• Mathews (n.d): door jamb 3</td>
</tr>
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<td>• Graham and Mathews (n.d.): panel 3</td>
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<td>• Garcia Moll (2005):</td>
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|            | Sak Tz'i'       | elementos 30-1 (edificio 4), elemento 41 (edificio 7) | • *The Montgomery Drawings Collection* (Montgomery 2000):  
  • randel stela, caracas panel |
|            | Tonia           | (149 pictorial images)                | • *Corpus of Mayan Hieroglyphic Inscriptions* (Flash & Graham n.d.):  
  fragment 1, fragment 32, fragment 35, fragment 43, fragment 88, fragment 91, misc. 1-6, monument 1, monument 3, monument 5-20, monument 22, monument 24-39, monument 41-48, monument 50-52, monument 55-56, monument 63, monument 65, monument 69-77, monument 80, monument 82-85, monument 87, monument 89, monument 91, monument 95, monument 98-102, monument 104, monument 106-111, monument 113-117, monument 121-123, monument 125-126, monument 130-131, monument 133-176 |
|            | Tzendale        | (1 pictorial image)                   | • Spinden (1913):  
  stela 1 |
|            | Unprovenanced   | (3 pictorial images)                  | • Houston (1989):  
  Canberra stela, Stokes panel, Saenz stela |
|            | Yaxchilan       | (63 pictorial images)                 | • *Corpus of Mayan Hieroglyphic Inscriptions* (Flash & Graham n.d.):  
  lintel 1-10, lintel 12-59, step 1-5 |
|            | Motagua Region  | (2 sites; 32 pictorial images)        | • Robicsek (1972):  
  stela A, altar Y, stela B, stela D, zoomorphic altar of stela F, stela H, stela I, stela 2, stela N, altar O, altar 41, flat altar of western court, stela P, altar Q, stela 19, altar |
<p>|            | Quirigua        |                                       | • Looper (2009): |</p>
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<td>Murals</td>
<td>Yucatán</td>
<td>Tulum (12 pictorial images)</td>
<td>● Miller (1982): structure 1-sub mural 1, structure 1-sub mural 3, structure 1-sub mural 2, structure 1 column painting, structure 5 upper façade, structure 5 mural 1 interior east wall, structure 16 southern corner west façade, structure 16 mural 10, structure 16 mural 7, structure 16 mural 1, structure 16 mural 2, structure 16 mural 5</td>
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<td>Tancah (4 pictorial images)</td>
<td>● Miller (1982): structure 12 mural 1, structure 44 room 1 mural 1, structure 44 room 1 mural 2, structure 44 room 1 mural 3</td>
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<tr>
<td>Petén</td>
<td>Calakmul</td>
<td>(14 pictorial images)</td>
<td>● Carrasco Vargas &amp; Cordeiro Baqueiro (2012): section SE-E1, section EsE-LtS2, section NE-N1, section EsS-LtE1, section NO-N2, section SE-S2, section NO-O2, section SE-S1, section SE-E2, section NE-N2, section EsO-LtN1, section SO-S1, section EsN-LtE1, section NE-E1</td>
</tr>
<tr>
<td></td>
<td>Tikal</td>
<td>(1 pictorial image)</td>
<td>● <em>The Linda Schele Drawings Collection</em> (Schele 2000): structure 5d sub 10</td>
</tr>
<tr>
<td>Southern</td>
<td>Santa Rita</td>
<td>(1 pictorial image)</td>
<td>● <em>Bureau of American Ethnology 19th Annual Report</em> (1900):</td>
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Table A.1. Regions, archaeological sites, sources, data sampled for pictorial images on monumental architecture. Number of pictorial images sampled only includes monumental architecture with pictorial images that are still visible and not eroded.
<table>
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<th>Sample Items and Sources</th>
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<td>(1 site, 1 pictorial image)</td>
<td>east half of north wall mound 1, west half of north wall mound 1, north wall mound 1</td>
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<td>Pasion Region</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Western Region (2 sites, 20 pictorial images)</td>
<td>Bonampak (19 pictorial images)</td>
<td><em>The Linda Schele Photograph Collection</em> (Schele 2005): rooms 1-3</td>
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<td></td>
<td>Palenque (1 pictorial image)</td>
<td><em>Greene Robertson (1985): house E</em></td>
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<tr>
<td>Motagua Region</td>
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Table A.2. Sources and data sampled for pictorial images from murals. Number of pictorial images sampled only includes murals with pictorial images that are still visible and not eroded.

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<th>Media Type</th>
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<th>Sample Items and Sources</th>
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<td>Vases (870 pictorial images)</td>
<td>N/A</td>
<td>N/A (870 pictorial images)</td>
<td><em>The Maya Vase Database</em> (Kerr n.d.): 96, 97, 109, 114, 127, 196, 206, 252, 319, 502, 503, 504, 505, 508, 509, 511, 512, 514, 517, 558, 559, 578, 593, 594, 595, 620, 621, 622, 623, 631, 671, 679, 680, 681, 688, 694, 695, 700, 702, 787, 791, 792, 793, 795, 796, 808, 868, 927, 928, 954, 956, 974, 998, 1001, 1002, 1003, 1004, 1118, 1119, 1221, 1151, 1152, 1162, 1180, 1181, 1182, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1280, 1283, 1285, 1286, 1288, 1299, 1300, 1301, 1303, 1333, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1353, 1354, 1356, 1362, 1364, 1365, 1366, 1367, 1368, 1381, 1382, 1383, 1384, 1386, 1387, 1388, 1389, 1391, 1442, 1446, 1451, 1452, 1453, 1454, 1456, 1463, 1485, 1559, 1560,</td>
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Table A.3. Sources and data sampled for pictorial images on vases. Number of pictorial images sampled only includes vases with pictorial images that are still visible and not eroded. Provenience information is not provided because it is not consistently available for vases.
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<td>• de Rosny (1883): Madrid Codex</td>
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Table A.4. Sources and data sampled for pictorial images on vases. Number of images sampled only includes pages with pictorial images that are still visible and not eroded. Provenience information is not provided because most of the extant codices were not found in situ.