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**TYPOLGY OF SIGNED LANGUAGES:
DIFFERENTIATION THROUGH KINSHIP TERMINOLOGY**

BY

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B.A., Language Studies, Wellesley College, 1999
M.A., Linguistics, Gallaudet University, 2001

DISSERTATION

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Doctor of Philosophy
Linguistics**

The University of New Mexico
Albuquerque, New Mexico

August, 2009

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DEDICATION

To my mother

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ABSTRACT

Nearly all such studies have sought to understand the linguistic constraints of spoken languages, while largely neglecting signed languages. Despite the fact that spoken languages can be classified into types, signed languages are generally assumed to be clustered all together in one type which the current study challenges. Exploring the potential for a varied typology among signed languages requires identifying patterns across a sampling of geographically distinct and historically unrelated signed languages to formulate linguistic generalizations. To that end this study adopts Greenberg's 1966 analysis of Universals of Kinship Terminology, it examines the linguistic patterns that emerge from a comparison of kinship terminology in 40 signed languages, specifying what patterns can be seen in visual-gestural languages.

Findings of this study revealed that form-function mappings of specific semantic domains are constructed by different strategies including: iconicity motivated by universal human and cultural-specific traits, arbitrary elements, and linguistic economy

(semantic derivation). Patterns reveal that kin terms are motivated yet contain degrees of arbitrariness, suggesting a continuum of interaction of arbitrariness and iconicity. While iconicity is undeniably pervasive in signed languages, salient properties manifested in signed kinship terminology are not universal, but instead reflect the cultural and cognitive perception experienced by deaf people within their linguistic communities. As a result iconic properties framed by language-specific and cultural specific mappings lend to variations in signs, describing the trend that signed forms' phonological properties are not simply phonemic representations, but instead are phonological properties that inherently signify semantic properties. In turn, iconicity emerges as an undeniable and powerful tool of schematization used to form signs in a visual-spatial modality.

Data showed some kin terms were motivated by patterns of specific semantic-phonological interdependency. These patterns identified occurrences of semantic derivation and semantic extension within language-specific sets of kin terms. Signed kin terms are formed by combinations of initialization, fingerspelling/character writing constructions, and iconic and arbitrary descriptions. However, organization of kin terms by linguistic processes may not parallel what Greenberg found in his study of spoken languages. The nature of modality clearly manifests in different ways of organizing signed languages and spoken languages; illustrated by how markedness manifests differently.

The extent of linguistic phenomenon seen in the domain of kinship terminology underscores the importance of exploring semantics through studies of phonology, morphology, and grammar in signed languages. Typological analyses of signed languages contribute significantly to understanding what linguistic traits appear consistently through

all languages, both spoken and signed, by revealing more about the effects of the modality-independent and modality-dependent behaviors of languages in defining language universals.

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CHAPTER 1: INTRODUCTION

If language is a mirror of human cognition, then the study of language offers a plethora of opportunities to better understand how the mind works. Through comparative, cross-linguistic studies, language typology explores universal characteristics of language that identify cognitive functions independent of language or culture. Patterns that repeat across languages reveal language generalizations that can be analyzed in language typology. Language typology helps discern language universals – a key to unlocking the mysteries of human cognition.

Language is a cognitive function. All humans communicate through language, and languages exist in every human society from high-paced technological societies of the West and Far East to developing cultures to indigenous societies. To understand what is truly universal to all languages requires collecting widely diverse information from the languages from the rainforest in the Amazon to the mountains of Nepal. Such cross-linguistic studies reveal some striking similarities in patterns, suggesting common structure of human cognitive capacities as well as differences that exist among linguistic communities (Comrie, 2002; Croft, 2003; Greenberg, 1966). Properties that emerge as consistently common to all human languages ground the study of language universals (Comrie, 2002). A language universal indicates human language potential—a reflection of the underlying mechanism of human cognition (Comrie, 2002).

According to the practice of language typology, systematic comparisons of spoken languages have been used to classify them into a variety of structural types.

Through a systematic examination of grammatical structures and the relationship between linguistic form and function, languages are classified by type. The range of structural variation illustrated by comparative analyses also reveals constraints on language variation (Croft, 2003). Croft writes of the relationship between language and typology: “... a language is taken to belong to a single type, and a typology of languages is a definition of the types and an enumeration or classification of languages into those types” (Croft, 2003, p. 1) An empirical survey of a large sampling of languages can provide insight into the patterns that systematically emerge from languages. These patterns of constraints, within the range of structural variation, ground typological generalizations that ultimately lead to language universals (Croft, 2003). Typological studies investigate generalizations that predict the universal properties and distribution of the structural types of languages.

Nearly all such studies investigate the linguistic constraints of spoken languages, while largely neglecting signed languages. Research on signed languages continues to be in its infancy compared to the body of research on spoken languages. In light of the focus of language typology on spoken languages, significant concerns are posed by the exclusion of signed languages. By including only spoken languages, descriptions of language generalizations and universals bias toward one modality—vocal-auditory. As spoken languages are typed together by vocal-auditory modality, additional research studies have gone beyond modality to typologically classify spoken languages using formal properties and functions. In contrast, prevailing linguistic wisdom currently explicitly types signed languages together, solely on the basis of visual-gestural modality.

Very few typological studies investigate the variations of formal properties and functions among signed languages. This bias warrants reconsideration using a more inclusive sampling on which to base language generalizations and universals. Sampling all human languages, to include both vocal-auditory and visual-gestural modalities has the potential to discriminate modality-dependent and modality-independent behaviors and contribute new understanding of language universals that span both modalities. Language universals intentionally represent universal traits of all human languages, which by *de facto* definition should refer to modality-independent traits.

Signed language linguistics addresses the unique property of visual-gestural modality manifested in these languages. Signed languages have been generally assumed by the linguistic community to be clustered all together in one type; an underlying assumption that grounds the literature of verbal constructions of signed language linguistics. Arnoff, Meir, Padden, and Sandler (2003) write,

This (verb agreement and classification) presents us with a typological puzzle. All sign languages we know of have this type of verb agreement and verb classification. Yet no spoken language that we know of has the tripartite classification into plain verbs, spatial verbs, and agreement verbs, and none show the particular sort of agreement found in sign languages. (p. 58)

Corroborating this claim, Hoiting and Slobin stated that “...probably all signed languages are verb-framed in their typology” (2001, p. 125). Their assumption about the

typology of signed languages revolves on verbal constructions of signed languages, and if this typological description applies to all signed languages, then the language variation constraint may be modality-dependent instead of modality-independent. However, most signed languages have not yet been well investigated, let alone classified into grammatical categories by signed language. Rather than over-generalizing properties of signed languages based on verbal constructions, investigators need to observe other domains of formal and functional properties in signed languages to determine typology.

The tradition of signed language linguistics borrows its methodologies from the study of spoken language; providing a unique opportunity to explore similarities and differences between signed and spoken languages. The borrowing of methodologies is driven by at least two factors: pressure to validate signed languages as true natural languages using the same criteria defined used for spoken languages, and the paucity of knowledge and established methodology for studying the unique characteristics of signed languages. The portrayal of similarities in structural properties across modalities indicates that signed languages may be considered weak variations of spoken languages from an “assimilationist” perspective. Growing evidence from recent research underscores the acceptance and deep appreciation for certain structural properties unique to signed languages that contribute valuable insights into human language systems inherently reflecting biological, cognitive, and socio-cultural behaviors of the communities who use them (Antinoro Pizzuto, Chiari, & Rossini, 2008b; Cuxac & Sallandre, 2007). In the light of recent signed language analyses of the non-assimilationist view, Pizzuto, Pietrandrea, & Simone (2007) addressed the need to profoundly re-consider the modality-specific bias

inherent in spoken/written language research-- which also applies to the area of language typology.¹

Adhering to the methodological practice of language typology warrants examination of formal and functional properties of historically unrelated signed languages from large sampling of geographically distinct regions before positing generalizations. Typological studies of signed languages provide the opportunity to examine linguistic patterns to determine modality-specific behaviors and language generalizations that may be universal.

If spoken languages can be meaningfully classified into types, does it follow that signed languages, too, might be classified in a similar fashion? The value of the classification of language types poses an opportunity to identify the typology in signed languages. Prevailing wisdom suggests that all signed languages should be considered part of the same language type based on verbal constructions, but this view does not account for the variation in other domains here-to-fore uninvestigated. Exploring the potential for a varied typology among signed languages requires identifying patterns across a large sample of signed languages using a method similar to that used to examine spoken languages to formulate linguistic generalizations. To that end this study examines the linguistic patterns that emerge from a comparison of kinship terminology, specifying

¹ From the non-assimilationist perspective, extensive research has involved mainly with French Sign Language but currently is growing by independent works of other signed languages (Cuxac, 2000; Cuxac & Sallandre, 2007; Pizzuto, 2007; Slobin, 2008; Vermeerbergen, Leeson, & Crasborn, 2007).

what characteristics, relationships, and patterns can be seen in the visual-gestural modality. Typological analyses of signed languages can potentially contribute significantly to understanding what linguistic traits appear consistently through all languages, both spoken and signed, by revealing more about the effects of the modality-independent and modality-dependent behaviors of languages in defining language universals.

Background

The assumption that signed languages are of one type may lie in the fact that the modality of all signed languages is channeled through a visual-gestural system; however, one may argue that the same reasoning could apply to spoken languages and they could be considered of the same type based on modality. On that particular discrimination of formal modality, signed languages are typed together; spoken languages typed together. Modality facilitates different linguistic processes of exploitation to convey linguistic structures, providing enlightenment on language universals of modality-dependent and modality independent typology (Emmorey, 1996; Liddell, 2003; Pizzuto & Volterra, 2000; S. Wilcox, 2004a; Zeshan, 2008).

The approach of language typology depends on how function is encoded in linguistic form with respect to arbitrariness and iconicity. The typological approach incorporates characteristics of both formal and cognitive linguistics. Historically, signed language research has focused on validating signed languages as full-fledged languages by discovering formal linguistic properties comparable to spoken languages without fully

addressing the robustness of iconicity observed in signed languages.² Recent works have adopted a cognitive-functionalist approach to examine motivation in patterns of linguistic and grammatical constructions (Cuxac & Sallandre, 2007; Dudis, 2004, 2007; Liddell, 2003; Taub, 2001; P. Wilcox, 2000; S. Wilcox, 2004a). Conducting typological studies of signed languages could reveal signs' motivation yet identify degrees of arbitrariness, suggesting a continuum of interaction of arbitrariness and iconicity in signed languages.

The architecture of signed languages exploits gestural (body and face) properties expressed in space; representing richly productive linguistic structures. Many of these structures illustrate iconicity as discussed in much of the literature of American and European signed languages. Although iconicity is pervasive in signed languages, it is not necessarily transparent; that is the meaning from a gestural expression is not necessarily evident to those perceiving it. For example, in Italian Sign Language (LIS), the sign *student* is realized with a hand moving into the armpit of the signer. The sign is motivated by the action of holding books inside of an arm, conveying a cultural bounded representation of students in Italy that is not necessarily evident to those who are unfamiliar with the motivation rooted in the sign. In contrast, an expression of tracing a circle with an index finger to represent a circle is considered to be self-evident and

² There is a huge growth in research on motivation and iconicity in spoken languages. An example concerns relative clauses in spoken languages and finds the grammatical construction to be semi-motivated, which is somewhat similar how signs are constructed. However, profound discussion pertaining motivation and iconicity in spoken languages is beyond the scope of the paper. Refer to works of Joan Bybee, William Croft, Talmy Givón, John Haiman, Eve Sweetser, Elizabeth Traugott and others for further readings.

transparent to anyone who shares the cognitive abilities to process culture-independent and language-independent concepts.

Iconicity expresses salient selected features through gestural forms that are conceptually shared among members of a linguistic group. For example to illustrate how salience is determined by its own linguistic community, consider how the form of *train* in three signed languages is conveyed through different iconic features. The American form entails speedy movement on rail tracks; the Italian one conveys movement of metal links attached to train's wheels; the Norwegian shows the path of train on rail tracks. Each representation is understood by its linguistic community. For another example of a person term take *woman* in Afghan Sign Language and Norwegian Sign Language. Afghan Sign Language expresses a metonymic form of *woman* by the depiction of the long hair of a woman (which is typically the hairstyle worn by Afghan women).³ Norwegian Sign Language depicts a woman's breast to denote *woman*. These salient characteristics function as metonymic components, where one feature is chosen to represent the whole concept. Although they are semantically motivated, there is still variation in construing the concept, which is not unlike spoken languages. Iconicity constructs signed lexicon using metaphoric and metonymic mapping from a source domain of physical experience to a target domain, E.g. MORE IS UP – a vertical movement to express the meaning of *older* (also encodes the semantic property of *tall* and *big*) in Italian Sign Language (LIS). Both metonymic and metaphoric components provide a rich array of meaningful

³ An alternative explanation would be a reference to a head scarf donned by Afghan women.

components productive in forming signs, and these components ground the investigation of potential morphological constructions of signs.

To discriminate potential morphological components in signed languages, signed language linguists need to examine classes of signs that contain shared semantic properties and similar phonological structures. Studies show that signs are formed through morphological processes of lexical extension, reduplication (noun-verb pairs), affixation, compounding, and numeral incorporation (Johnston & Schembri, 2007). From a cross-linguistic standpoint, evidence on signed languages reveals grammatical categories of verbs, nouns, and adjectives that experience modification through an exploitation of space and movement (Emmorey, 1996; Engberg-Pedersen, 1993; Johnston & Schembri, 2007; Klima & Bellugi, 1978; Liddell, 2003; Padden, 1988, 1990; Pizzuto & Corazza, 1996; Wilbur, 1987). Morphological components are manifested in signed languages; however, limited knowledge exists about the structural complexity of signed languages in nominal constructions such as kinship terminologies.

Investigating the relationship between phonological structure and semantic properties of signs enables the differentiation of phonological features and morphological components of signed languages. Examination of these relationships has the potential to open up an on-going dialogue in the field of signed language linguistics.

Statement of the Problem

Although interest in conducting typological studies on signed languages and their linguistic structures is growing in a number of recent publications, no known typological study has yet directly investigated the relationship between phonological structure and

semantic domains (linguistic form and function) in samples containing a large set of signed languages. Examining the interaction of formational properties and functions is crucial in search of structural types realized in signed languages.

Undertaking typological studies requires a language sampling of historically unrelated languages. However, in the field of signed language, gathering a completely representative and balanced language sampling becomes an insurmountable challenge due to several factors. First, access to adequate documentation of most signed languages is limited or unavailable for some languages in forms suitable for linguistic analyses. One primary explanation for the limited availability of documentation could be that no known signed languages have autonomously developed a corresponding written form. Another possible explanation could be that most transcriptions of signed language data do not provide a way to recover the forms of the signs; hindering signed language analyses by transcription methodology (Antinoro Pizzuto *et al.*, 2008b; Di Renzo, Lamano, Luciola, Pennacchi, & Ponzio, 2006; Vermeerbergen, 2006; Vermeerbergen *et al.*, 2007.)

Although linguistic descriptions have been documented for a small subset of signed languages, most signed languages' descriptions remain undocumented or unknown. Another limiting factor, most existing linguistic descriptions of signed languages predominately represent developed countries in the West (e.g. North American and Europe), biasing the sample which can lead to potentially misleading assumptions about signed language typology if the sample does not incorporate non-Western signed languages. Yet another factor, insufficient knowledge about historical relationships among signed languages exists in terms of migratory or genetic relationships that

influenced the evolution of different signed languages, challenging any approach toward creating an unbiased, balanced and representative language sampling of signed languages.

Beyond these obstacles inherent in the study of signed languages, very little is documented about the relationship between linguistic form and function, structural types of signed languages, linguistic patterns and generalizations that can be inferred about signed language typology. This paucity of research contrasts starkly to the many such typological studies of spoken languages.

Purpose of the Study

A review of literature suggests that signed languages are typed together because of modality and similar patterns in verbal constructions. This study challenges these assumptions of signed language typology by conducting a cross-linguistic analysis of a large sampling of geographically dispersed signed languages. The domain of kinship terminology provides a shared semantic domain across all languages studied. This study explores kinship terminology construct in language-specific patterns through an analysis of form-function mappings. The semantic domain of kinship lexicon grounds how semantic properties are encoded through form-function mappings in individual signed languages. Screening for patterns across signed languages reveals cross-linguistic tendencies useful in defining language generalizations and universals with respect to signed language typology. The analysis leads to a comparison with Greenberg's descriptions of language universals in kinship terminology of spoken languages. The purpose of this study is to examine a framework of kinship lexicon in search of patterns

to differentiate typology in part to challenge prevailing assumptions about signed language typology.

Significance of the Problem

Since the basis of language universals primarily draws from the type of vocal-acoustic modality of spoken languages, examination of signed languages can add formal properties manifested in the visual-gestural modality to enrich this body of knowledge. Comparing generalizations of these two formal types of modality provides a better understanding about modality-dependent and modality-independent behaviors. Language universals defined on the basis of modality independent generalizations would ground a better basis for language universals, leading to generalizations that can ultimately be incorporated into a language typology inclusive of both spoken and signed languages.

Beyond the field of language typology, the discovery of a typology of signed languages could also enrich other sub-fields of linguistics and signed language research; anthropological linguistics in particular. This study would also contribute to the understanding of the historical linguistics of signed languages; specifically the exploration of the possible genetic relations among signed languages representing language families. Many of the signed languages analyzed in this study have not been previously formally accounted, and this study contributes significant scholarly knowledge to these linguistic communities.

Nature of the Study

To examine whether signed languages can be classified as one language type or more than one language type, this study investigates kinship terminologies' phonological

structures from a large sampling of signed languages. To determine typological classification of signed languages, several steps must be taken.

To discriminate linguistic patterns of kinship terminologies in signed languages, the relationship between form and function within a language-specific set of kin terms must be observed. After compiling inventories of language-specific kinship terminology, these kinship terminologies must be coded by their formational properties, extracting phonological structures of handshape, location, and movement. To analyze the distribution of linguistic patterns, the nature of the relationship between phonological structure and semantics in each language-specific set of kinship terminology must be analyzed. Kinship terminologies must be analyzed according to formational properties and genealogical relations within the kinship system.

As formational properties map to specific semantics, patterns revealing a paradigmatic relationship in each language-specific set of kinship terminology have the potential to emerge. Language-specific kinship terminology is analyzed to determine if terms are descriptive or classificatory. Surveying the distribution of language-specific form-function mappings grounds the understanding of the structural types and language generalizations that emerge, providing a framework for a typological classification of signed languages. Structural coding of signed languages' kinship terms provides a basis for typological classification demonstrated through both qualitative and quantitative analyses. Kin terms categorized by the kin types represent the genealogical relationship of the kinship system. Analyses of language-specific kinship terminologies reveal types of classifications in terms of descriptive and/or classificatory kin terms.

Research Questions

The research questions that scaffold this study frame a search for typological patterns of kinship terminology in signed languages.

- 1) *Research Question #1*: The primary research question to be addressed by this study was, can signed languages be classified as more than one language type? The premise of this study was that a comparative analysis of the phonological structures of kinship terminology could determine this question. The following research questions support the investigation of the primary research question:
- 2) *Research Question #2*: Do linguistic patterns emerge from a comparison of kinship terminology in signed languages of geographically dispersed regions? If linguistic patterns do emerge, the following research questions apply:
- 3) *Research Question #3*: What is the nature of the relationship between phonological structure and semantic domains kinship terminology in signed languages that can inform classification of language type? To gain insights into plausible classifications of language type in signed languages, this study examines the nature of the relationship between phonological structure and semantic domain. The analysis of these patterns provides insight into how these patterns emerge within individual signed languages.
- 4) *Research Question #4*: Are there any phonological structure and semantic relationships that generalize across the geographically-dispersed signed

languages sampled? The goal here is to identify generalizations that cut across signed languages as they may inform typology classification.

- 5) *Research Question #5*: Do identified generalizations match Greenberg's universals of kinship terminology for spoken languages? If generalizations exist, then do they parallel what Greenberg has described about the universals of kinship terminology in spoken languages? If universals between signed and spoken language are parallel, then an argument for supporting the same guidelines for classifying typology in spoken language might be legitimately applied to signed languages.

Hypotheses

The following hypotheses, based on the research questions provide the framework for this study. Findings of this study reflect whether these hypotheses can be refuted or not, to provide more insight into the linguistic behaviors of signed languages.

1. H1₀: Signed languages constitute only one language type.
2. H2₀: Comparison of kinship terminology of geographically dispersed regions does not yield discernable patterns for signed languages.
3. H3₀: There are no apparent relationships between phonological structure and semantic domains in the kinship terminology of signed languages sampled from geographically-dispersed regions.
4. H4₀: No linguistic patterns in the kinship terminology appear to generalize across signed languages sampled from geographically-dispersed regions.

5. H₅₀: No identified generalizations can be drawn from the kinship terminology of signed languages sampled from geographically-dispersed regions that match Greenberg's universals of kinship terminology for spoken languages.
6. To determine if these null hypotheses can be refuted, the methodological design of this study specifies how analytic tools can be systematically employed to study typological patterns in signed languages.

Theoretical Framework

This study adopts a typological-functionalist theoretical framework. This study explores and describes linguistic behaviors of kinship terminologies across signed languages. Based on the Greenbergian model, this empirical study surveys a large sampling of geographically dispersed signed languages, compiling language generalizations identified by a quantitative and qualitative analysis. Since this study includes many signed languages not previously described in formal linguistic analyses (and/or which have not been described in publications written in English), this study provides qualitative descriptions of linguistic patterns emerging in kinship terminology of individual signed languages as well the tendencies that emerge across signed languages. Figure 1 represents the methodological framework of this study.

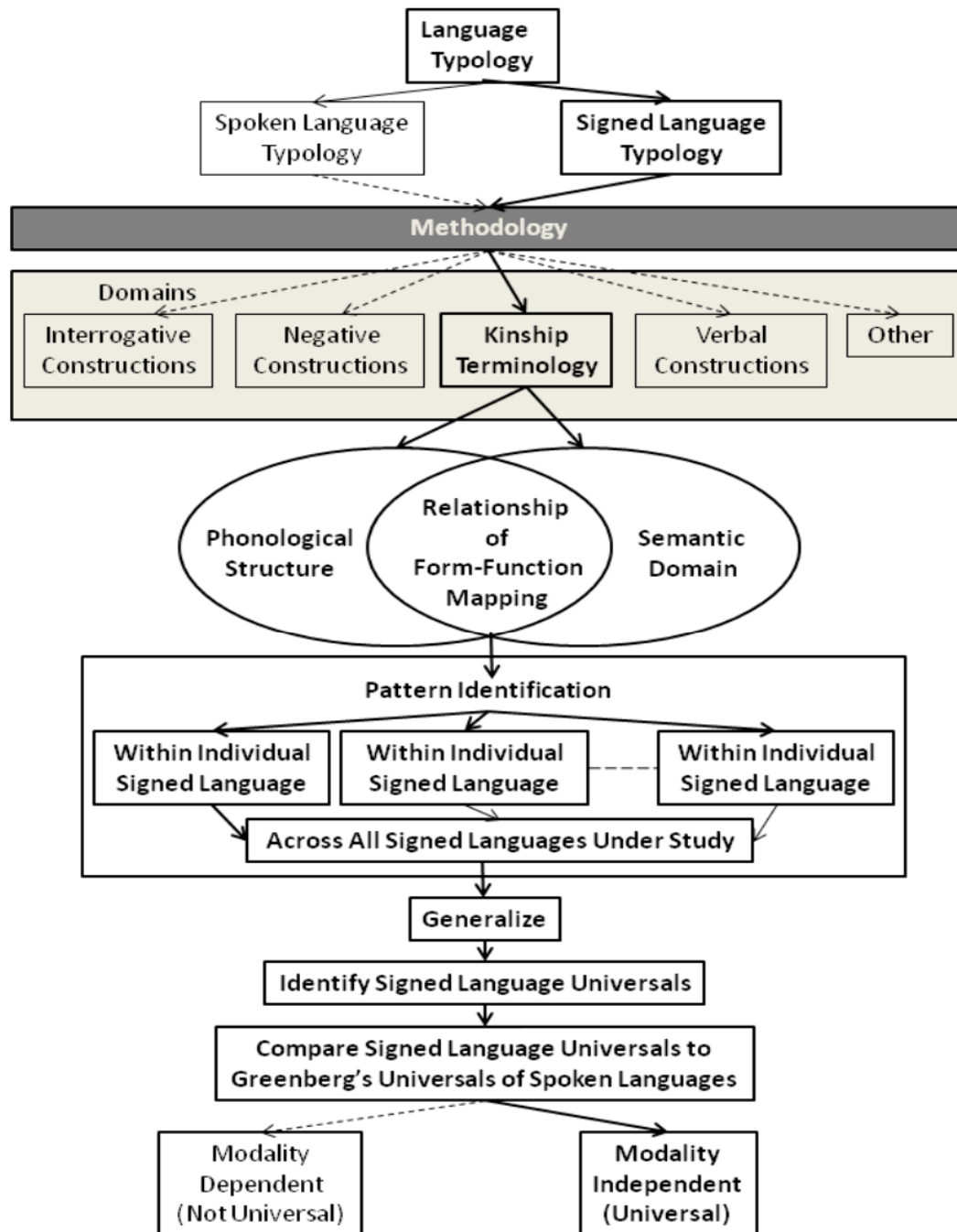


Figure 1: A typological framework modeling the incorporation of signed languages and spoken languages in order to seek language universals. In this study, the domain focuses on kinship terminologies of signed languages.

Kinship

Every human society known operates on a kinship system. A kinship system consists of members of a group who share a common language (linguistic community) who co-exist in a similar culture based on individuals' relationships of blood and marriage tied to rights and obligations (Nanda, 1994). Kinship systems all have terminology to classify different kinship roles.⁴ However, different types of cultural kinship systems categorize members into different categories of kin relations. A kin term represents a specific type of kin category expressed as a distinct semantic unit (Parkin 1997). Kinship terminology provides one of the most highly organized lexical sets enabling linguists to systematically analyze language typology in search of language universals. The universals used in this study are based on definitions in Greenberg's 1966 paper "Universals of Kinship Terminology".

In order to examine kinship terminology in signed languages requires a brief introduction about how terminology defines kin relations. These definitions lend insight into how to classify patterns using kinship terminology. Parkin (1997) provides accessible definitions as restated in Table 1:

⁴ In anthropological works, kin roles are not necessarily defined based on biological and/or genetic relations, but typically are defined by social roles within the kinship system.

Table 1

Definitions of kinship terminology in terms of conceptualized representations of kin members as described in kinship systems:

Term	Definition
Ego	Within kinship systems, the individual is conventionally designated as Ego
Nuclear kin	Consists of only parents and children
Generation	Phases in the chronological or vertical dimension of kinship
Ascending kin	Kin in levels above Ego in the direct line of ascent
Descending kin	Kin in level below Ego in the direct line of descent
Lineal kin	Kin linked to Ego in a direct line of descent from parents (siblings: children of his or her own parents are normally counted as lineal kin)
Collateral kin	Kin linked to Ego by branching as defined: further steps which go at least partly in a lateral direction on the conventional diagram (cousins) descended from a common ancestor of Ego
Consanguineal	Relatives related to Ego by descent or filiation (ties between

Term	Definition
(cognate) kin	parent and child) and not by marriage
Affinal kin	Relatives by marriage
Descriptive kin term	Distinctive representation of one type of relationship between two kin members (E.g. English term for female sibling: sister refers to a daughter of the same parent)
Classificatory kin term	Collective representation of many types of relationships (E.g. English term for first collateral descent female kin member: niece may refer to sister's daughter, brother's daughter, husband's sister's daughter, husband's brother's daughter, etc.)

Note: Most definitions of kinship terminology are introduced in pages 28-36, while other terminology are discussed in other sections (Parkin, 1997).

Kinship terminology cannot be assessed without anthropological references to kinship systems. The relationship among kinship terms and their systems type by language and culture; indicating that structure for kinship terms and systems is not universal. The kinship system dictates what terms are expressed as factors in the analysis of the language typology of signed languages, where one system discriminates the kin relationship between mother's brother and father's brother with two descriptive terms while another system defines these kin relations with a single classificatory term (E.g *uncle* in spoken English). Adopting Greenberg's methods of his 1966 study on

“Universals of Kinship Terminology” in reference to anthropological works (Fox, 1967; Parkin, 1997), this study similarly investigates kinship terminology of signed languages for patterns of structural complexity. These clues embody the potential to contribute to the understanding of the language typology of signed languages and ultimately contribute to a broader understanding of language universals that apply to all languages.

Assumptions

For the purpose of this study, dictionaries are assumed to accurately represent the kinship terminology of their signed languages. The lexical set provided in dictionaries are assumed to contain all kin terms conventionally expressed in their linguistic communities. In other words, it is assumed that no kin terms are missing from the set, and that the dictionary contains no extraneous kin terms not used among signers of the lexicon. The illustrations in dictionaries are also assumed to convey accurate phonological descriptions of kin terms. The written translation equivalents of signed kin terms are also assumed. (See chapter 3 for detailed discussion). Written translation equivalences reflect the kinship system of a spoken language, implying that the signed language does share the same cultural framework of kin relations of the spoken language. In summary this study was limited by signed language dictionaries’ degree of authenticity in reflecting signed language.

A review of dictionaries revealed that signed languages are referred to according to their national geo-political boundaries. The reference of a signed language may reflect one signed language used within the nation, beyond national boundaries, or more than one signed language within the nation. For example, the linguistic community in

Germany identifies their signed language as German Sign Language (Deutsche Gebärdensprache), associating their signed language to the nation of Germany. Austrian Sign Language also defines their signed language by their country, calling it Österreichische Gebärdensprache. While there are two separate signed languages in Germany and Austria, the predominant language spoken in these neighboring nations is German, providing linguistic variations of spoken German in different regions of both countries. Two important points are illustrated: First, reference to a signed language typically is correlated to the geo-political boundaries where the signed language is used by the deaf community. The second point is that the language used by the hearing community cannot predict what signed language is used by the deaf community. The trend of identifying signed languages by geo-political borders differs from what is observed in spoken languages. The association of the signed language with their nation implies that there is only one signed language within the geo-political boundaries.

A few known cases describe where more than one signed language exists within national boundaries. For example, Spain has two signed languages tied to specific regions of culturally and politically distinct communities: Spanish Sign Language and Catalan Sign Language (Jarque 2005; Woll, Sutton-Spence, & Elton, 2001). Although there may be one national signed language, there may be dialectal variations. Studies reveal that dialectal variations are observed in the lexicon, defining lexical variation as regional

signs (McKee & Kennedy 2000; Woll *et al.*, 2001).⁵ In turn, the signed language represented in the dictionary assumedly reflects the language used in the entire nation.

A signed language dictionary may represent a particular variety of the signed language in a specific region within the nation. On the other hand, a signed language may extend beyond the borders of a nation. For example, deaf people communicate in American Sign Language in the United States and most of Canada. The signed language variety generally is referred according to the geo-political borders where the signed language exists, but the dangers of reference based on the nationality of the signed language ground misleading beliefs, assuming one and only one signed language for each geo-political region. One possible explanation for referencing signed languages by the geo-political region reflects the socio-political attitude of the signing linguistic community. A similar phenomenon exists in closely related spoken languages of Danish, Norwegian, and Swedish, identifying these languages as separate languages as opposed to dialectal variations of a language.

The question of variation in signed languages also involves atypical conditions of language acquisition and transmission in deaf communities. Most deaf children are born in hearing families who were never previously exposed to signed languages, whose caregivers' lack of familiarity with signed languages hinder deaf children's natural acquisition of a full language system at a young age. Deaf children ultimately acquire

⁵ Beside lexical variation, dialectal variations are poorly understood in other domains of language use in signed languages.

signed language from their deaf peers and non-native adult language models at school and/or in other signing settings. A small percentage of deaf population, the children of deaf signing parents acquire signed language naturally – similar to hearing children in typical developmental stages of language acquisition (Pettito, 2000). The circumstances many deaf children experience is to acquire language in a starkly different way than children who fully acquire language from their caregivers from birth. While the transmission of signed language acquisition is more intermittent due to availability of language models, not continuous like as seen in spoken languages, signed languages have maintained their survival over time. While it is clear that the acquisition and transmission of signed languages is unusual, what is more remarkable is the resilience and persistence of signed languages. This raises an interesting question about dynamic factors involved with this resilience and the impact on the structure of signed languages on its durability. In a sense, signed languages are constantly linguistically endangered as there is no continuous transmission between generations (e.g. parent to child) and non-native signers typically function as language models for many deaf people. However, signed languages maintain their resilience which begs further investigation, and must take into account language learning and transmission conditions unique to signed languages.

Insufficient knowledge regarding the extent of linguistic variation of signed languages currently exists as evidenced by geography and language acquisition and transmission. This study contributes to the continuing discussion about language variation in signed languages.

Limitations

Conducting a cross-linguistic study of signed languages presents various challenges. Many of the world's signed languages have not been documented or studied in detail to the same extent as American and European signed languages due to lack of funding, resources, and linguistic training.⁶ Cross-linguistic studies of signed languages requires extensive time and funding for investigators to maintain international networks and to travel abroad to study these signed languages, and to consult with Deaf signers within countries whose signed languages are under investigation.

To undertake a typological study, linguistic typologists often refer to documentation as a primary source for comparing grammatical structures of languages. Typologists rely on documentation such as reference grammars, which may vary by language in quality of descriptive linguistic properties. Creating potential for asymmetry in comparative linguistic studies, reference grammars provide readily accessible sources of information, often augmented by well described accounts (although they may vary in quality) of spoken languages. This is not true of signed languages. As of this writing, no known reference grammar on any signed language has been published (Zeshan, 2006, 2008). This pushes signed language typologists to rely on different sources of

⁶ Asian signed languages are being studied as well but in a smaller proportion compared to American and European signed languages, as their publications are written in their respective languages and not easily accessible to English readers.

information for their work that may not be equally well-investigated, as detailed, or of as high-quality, as sources used for studies of spoken language.

To overcome the difficulties in undertaking a cross-linguistic study of signed languages, readily available dictionaries were used as the basis for analyzing kinship terms. The availability of dictionaries constrains the specific signed languages that can be included in this study. Also, dictionaries in a book format pose other constraints, as they typically contain photos or drawings of signs and are described in their countries' own written languages. The quality of photos and drawings varies among dictionaries, and at times, these illustrations may be difficult to determine exactly how a sign is formed, especially with respect to movement. Some video based dictionaries (available for some signed languages on CDs, DVDs or the Internet) illustrate signs in motion. This information clarifies how signs are phonologically realized.

Dictionaries are not the best representation of how signs are formed, and may not contain all lexical entries and different forms actually used by signers. Also, dictionaries may mislead readers to assume that lexical entries are natural signs used among Deaf people. Instead dictionaries often become the framing Deaf people use to translate spoken/written lexicon into their signed languages. Glossed translation into English also causes potential ambiguity in discerning the relationship of kinship terminology within other signed languages; another limitation of this study.⁷

⁷ Gloss transcription is a conventional strategy to represent signed forms by word-labels. However, glosses require readers to be familiar with signed languages, and also it does not recover forms of signs

For all language sampling, international collaborators were consulted via email and web cam to clarify how kinship terms are actually used in their respective signed languages and to learn cultural connotations associated with the use of kinship terms. The validity of the kinship terminology in the signed language dictionaries used in this study needed to be substantiated through consultations with Deaf signers to ensure face and content validity and to ensure credibility and fitness for use in this study. Due to challenges inherent in determining signed language typology, the issue of limitations requires more attention, and expanded discussion has been included in Chapter 3. Limitations of this study include:

1. Inclusion of signed language dictionaries that can be publically accessed.
2. Survey of the number of signed language dictionaries within the time available to conduct the study.
3. Variation in the quality of signed language dictionaries available.
4. Potential ambiguity of kinship terminology due to glossed translation equivalences.

Delimitations

This study will confine itself to surveying the kinship terminology of forty signed languages listed in Appendix A Table A1. Adhering to two criteria of the survey, signed

similar to written representations of spoken languages which endangers signed language research by its implicated theoretical-methodological problem of adopting gloss as a primary linguistic representation tool (Pizzuto, Rossini, P, & Russo, 2006; Di Renzo, Lamano, Lucioli, Pennacchi, & Ponzo, 2006).

languages studied were derived from publically accessible signed language dictionaries, and chosen to represent language samplings of each macro-geographical region of the world. The inventories of kinship terminologies studied were limited to the examination of the formational properties of handshape, location, and movement in search of patterns illustrating form-function mappings of language-specific and cross-linguistic patterns in signed languages.

The Organization of the Dissertation

This study's report divides into five chapters. Chapter One describes the main purpose of the study, introducing the theoretical approach for the study along with a description of kinship terminology and kinship systems. Chapter Two discusses the relevant literature grounding the foundation of this investigation including previous research conducted in the areas of language typology particular to kinship terminology and signed languages, iconicity and lexicalization in signed languages. Chapter Three addresses the methodology of the study with a description of the research design, sources of data collection, and procedures for conducting this study. Chapter Four presents findings of data analysis, addressing typological patterns and generalizations that cut across signed languages. Chapter Five concludes with findings, drawing conclusions and recommendations for future research in the field of signed language typology. A brief discussion addresses how this study contributes to the field of linguistics, signed language research, and other disciplines.

Summary

This study explores the relationship between linguistic form and function in the domain of kinship terminology, seeking generalizations and universals in signed languages. Since the Greenbergian model frames language generalizations and universals in terms of spoken languages, the inclusion of signed language research such as this study adds understanding to the body of knowledge of language generalizations and universals with respect to modality-dependent and modality-independent properties.

CHAPTER 2: REVIEW OF THE LITERATURE

To initiate the subfield of signed language typology, adopting the theoretical and methodological approaches used by spoken language typologists to use with signed languages appears to be a rational way to proceed. This chapter discusses the literature of signed language typology, genetic history, signed language research particularly with reference to iconicity, and issues associated with discriminating between phonology and morphology in signed languages. A section pertaining to kinship involves Greenberg's analysis of kinship universals, studies of kinship terminology in signed languages, and Woodward's analysis of Greenberg's kinship universals applied to signed language varieties. These analyses ground the theoretical and methodological framework for this dissertation study.

Documentation

Sources of Signed Language Typology

Until very recently, language typology and signed language research have interacted very little between disciplines. Very few works have directly studied signed language typology (Woodward, 1978a; Zeshan 2004a, 2004b, 2006, 2008).

Literature Review

This cross-linguistic study of a large sampling of genetically and geographically unrelated signed languages depends on a wide range of available documentation of individual signed languages to systematically examine similarities and differences in linguistic patterns. Patterns of language variation define linguistic diversity (Croft, 2003; Greenberg, 1966; Zeshan, 2008). Study of the patterns inherent across signed languages

can lead to a framework of linguistic universals (Zeshan, 2008). Comparing similarities and differences among signed languages requires evaluating their function within linguistic structures as defined by the literature (Zeshan, 2008).

Language Typology

Schematic framework: Language typology and signed language research

Zeshan (2008) discussed the lack of signed language typology, and proposed how signed language typology would benefit both the disciplines of language typology and signed language research. This pioneer introduced the idea of a schematic framework depicting how the overlap between language typology and signed language research could be used to create a signed language typology. In Zeshan's view, signed language typology can draw upon the theories and methods applied to the linguistic typology of spoken languages, and impose the same rigor to accessible signed languages. Conversely, signed language typology draws mostly from exploring similar linguistic properties represented in linguistically-diverse, signed languages studies. Data from studies of individual signed languages could be threaded together to examine emergent patterns across signed languages—this particular methodology grounds a typological perspective on signed languages (Zeshan, 2008).

Comparing signed with spoken languages leads to questions concerning what effects modality imposes on language. Comparing two types of modality effects (modality-dependence and modality-independence) triggers re-examination of the current framework of language universals postulated by language typology. Appreciating linguistic diversity and modality differences among signed and spoken languages can

greatly enrich language universals in typological works (Slobin, 2006, 2008; Zeshan, 2008).

Genetic History of Signed Languages: Issues and Methodology

Typological analysis requires examination of linguistically-diverse traits of a subset of languages that are not genetically related (Croft, 2003). Genetic history provides another important factor to consider in analyzing signed languages. The evolution of each signed language is its history; however, much of this information is either undocumented or inaccessible.

Genetic classification of languages depends on three criteria: genetic history, language contact, and psychological-based behavior. The latter concerns the effects of frequency of changes in phonological forms and semantics; however, very little information about this has been documented (Morford & MacFarlane, 2003; Wilkinson, 2007). The comparison of genetic classification in spoken languages is based on two major strategies: historical reconstruction and sources of written texts. Written texts preserve languages in a static form, representing the language used at a specific time in its history. As for signed languages, text sources must capture the language in visual medium such as film and two-dimensional illustrations.⁸ The relative newness and limits

⁸ The first known film documentation on American Sign Language, entitled “The Preservation of Sign Language” was presented by George Veditz in 1913. In rare cases, there are written accounts of signed languages with no illustrations, for instance, a document described French signs in written French with no illustrations (Bonnal-Verges, 2005).

of access to media technology to signing communities limits the availability of archives of data sources that might have documented genetic history. Except for anecdotal accounts of historical relationships in signed languages, the paucity of documentation of signed languages challenges the investigation of genetic history of signed languages. In turn, it is extremely difficult to form an accurate historical reconstruction of signed languages without a written representation of the forms of the signed languages investigated.

Historical reconstruction requires a linguistic comparison of at least two closely related languages to construct a hypothetical parent form (E.g.: proto form as an earlier form). The comparative-historical method uses diachronic analyses of linguistic structures in daughter languages to construct proto-language. Drawing from exhaustive historical analyses of spoken languages, the comparative method devised principles that account for predictable and systematic diachronic changes. The principles of examining historical linguistics in spoken languages cannot be completely applied to signed languages, as issues associated with signed languages include differences in modality and motivation of sign formation (E.g. iconicity and economy), contact with other languages, and the paucity of historical sources. As Zeshan stated, “not only is the genetic affiliation of most signed languages simply unknown, but the very notion of language families is not at all a well-defined notion in sign language linguistics” (Zeshan, 2006, p. 15). As a result, formulating a comparative-historical method for signed languages remains poorly developed and understood in terms of addressing methodological issues raised by signed languages.

The notion of genetic relationship in signed language continues to be poorly understood, grounding a crucial theoretical dilemma in signed language typology. This is a chicken-and-egg problem. Since conducting a typological analysis is based on a sampling balanced of genetic unrelated languages from different parts of the world, the study of the genetic history of signed languages has been severely limited by the inadequacy of historic data and analyses, and the challenges of methodological issues. Proceeding with comparative research of a small set of signed languages would be likely be biased by the genetically-related signed languages of the West (E.g. French and American) and would likely share similar typological patterns. Expecting to conduct a typological study of a completely randomized and representative set of signed languages would be unrealistic. However to minimize the effects of bias, it would be necessary to collect a representative set of signed languages that are presumably neither genetically nor geographically affiliated.

The history of signed languages is usually anecdotally shared in deaf communities. Although these anecdotal sources are speculative, information may be eventually verified by historical analyses. Some such linguistic histories have been documented in local written languages. A discussion of historical accounts is beyond the scope of this study, but several illustrations of migratory language influence on signed language experience have been described. The documented history of European and American signed languages suggests the genesis of these signed languages was often not isolated, but related to some other signed language.

The foundation of the school for the deaf in Paris by Abbot Michel L'Epee either directly or indirectly influenced the emergence of other European signed languages during the 1800's (Frishberg, 1975; Woodward, 1978b; S. Wilcox, 2004b). In mid-1800's, the import of French deaf education was introduced to Brazil and Mexico by a deaf Frenchman, Eduardo Huet, alluding to potential close historical relationships among French, Brazilian, and Mexican Sign Languages (Guerra Currie, Meier, & Walters, 2002). However, Guerra Currie *et al.* (2002) found a low percentage of lexical similarity between French and Mexican Sign Languages, proposing that Mexican Sign Language was not a direct daughter language of French Sign Language but may be emerged from a variety of French Sign Language and indigenous languages, e.g. Yucatan Sign Language (Johnson, 1991). The rise of Israeli Sign Language sprang from areas near and far: Germany, Eastern Europe, North Africa, and the Mid East, illustrating a rich montage of linguistic influences (Meir & Sandler, 2008). Furthermore, due to a huge influx of deaf Russian Jews immigrating to Israel in mid 1990's, Israeli Sign Language experiences language contact from Russian Sign Language, but it is unknown how much Russian Sign Language has influenced the linguistic structure of Israeli Sign Language as this has not been investigated yet to as this time of writing (Belozovsky, personal communication; Meir & Sandler, 2008).

In East Asia, Sasaki (2007) describes the influence of Japanese Sign Language had on Korean and Taiwanese Sign Languages that occurred as a result of the Japanese occupation in Korea and Taiwan before the World War Two. Dr. Andrew Foster, an American deaf missionary, established 31 schools for the deaf in sub-Saharan Africa

from 1957 to his death in 1987 (Kiyaga & Moore, 2003).⁹ These schools adopted Total Communication, a pedagogical-linguistic method to instruct the deaf through a visual representative system of spoken English, combining signs derived from American Sign Language and English-based signing system along with indigenous signed languages. Due to the efforts of educational, religious, and/or international non-governmental organizations that established and funded schools for the deaf, many signed languages were influenced by another signed language and/or by spoken languages.¹⁰ The problem with the genetic history of signed languages stems from the fact that “distance” in the genetic relationship cannot be based necessarily on geography, but on the import and export of signed languages to different geographic areas. This phenomenon is also seen in spoken languages (Croft, 2003).

Beyond the difficulties that revolve around the genetic and geographic relatedness of signed languages, the relationship between spoken/written and signed languages provides another type of language contact. Spoken and written languages influence signed languages because the majority of the Deaf population has been assimilated into

⁹ Dr. Andrew Foster was the first African-American graduate from Gallaudet University, and Gallaudet University recognized Foster as “Father of deaf education in Africa”.

¹⁰ The school for the Deaf in Jalalabad, Afghanistan is funded by SERVE Hearing Impaired Project (SHIP), a British Christian organization.

highly-literate, hearing societies.¹¹ As a consequence of language policies imposed by educational systems onto the deaf, the influence of written languages also manifests in sign formation (Lane, 1984; Reagen, 2001). Studies reveal that mouthing, fingerspelling, character writing, and borrowed constructions characteristic of spoken and written languages are integral in signed languages of different parts of the world (Green, 2008; Johnston & Schembri, 2007; Padden & Gunsauls, 2003; Youguang, 1980).

Faced with challenges of methodological issues in establishing genetic relationships, researchers devised approaches to determine if signed language varieties studied were distinct languages or dialects of the same language. Although the findings of comparative lexical analyses of signed languages is beyond the scope of this study, methodologies and the framework used in lexical analysis do pertain to this study.¹² Since no conventionalized framework exists to analyze genetic relationship and mutual intelligibility across signed language varieties, studies incorporate different approaches. Genetic analysis compares cognates to determine historical relatedness in signed languages. Intelligibility of current language varieties draws conclusions from comparison of lexical similarity in cognates. These methodologies utilize lexicon elicited from signed language dictionaries, the Swadesh word list, and naturalistic data sources

¹¹ While the rate of literacy is on the rise, it is important to keep in mind that the majority of spoken languages, existed in the past and also at the present, did and also may still do not have a written tradition (Ong, 1982).

¹² For thorough discussion, refer to works of Aldersson and McEntee-Atalianis, 2008; Bickford, 2005; Parkhurst and Parkhurst, 2003; Sasaki, 2007; Woodward, 1978b, 1993.

(Aldersson & McEntee-Atalianis, 2008; Johnston, 2000; McKee & Kennedy, 2000; Sasaki, 2007; Woodward, 1993a, 1993b, 1996, 2000).¹³

To determine degree of lexical similarity, cognates were compared based on the formational properties of handshape, location, and movement. With respect to palm orientation, McKee and Kennedy (2000) coded it as a separate phonological category while Aldersson and McEntee-Atalianis (2008) incorporated palm orientation in the category of handshape. Degree of phonological similarity determined classification of lexical comparisons in the study by McKee and Kennedy. Where cognates overlapped in every phonological feature, they were classified as “identical”. Where cognates shared all features except for one, they were classified as “different but related”.¹⁴ Where two or more features did not overlap, cognates were classified as “different”. In some cases cognates were identical in all phonological parameters except in handedness (one or two-

¹³ Woodward (1978b) conducted a lexical similarity analysis of American and French Sign Languages using the Swadesh list (1955). The study reported the degree of lexical similarity was misleading and too high— due to high iconic properties entailed in references to body parts (E.g. ‘nose’ is realized with a pointing to the nose) and pronouns (index finger pointing to ego: 1st person; index finger pointing to addressee: 2nd person; index finger pointing to space that do not refer to ego or addressee: 3rd person). Within this set, the formal property of pointing functions, known as indexation, referred to body parts and discourse-dependent grammatical persons. As a result, Woodward proposed a modified Swadesh list for signed languages (1978b).

¹⁴ Johnston utilized similar classification as defined by McKee and Kennedy except for the category of “different but related”. Instead, Johnston (2000) classified as “similar”.

handed). While McKee and Kennedy categorized as this as “other”, Johnston classified this as “identical”, arguing that the phonological and semantic properties of the sign remained unchanged when the two-handed sign became one-handed.¹⁵ Corroborating Johnston’s argument, Aldersson and McEntee-Atalianis concurred that asymmetry in handedness did not necessarily affect the semantics of a sign; however, if differences in handedness occurred, then they would be noted in their analysis.

Similar to synchronic studies of lexical similarity, historical relatedness in signed languages has not been extensively studied due to the scarcity of language data. However, a few empirical studies surveyed lexical data to compare signed language variation in Europe, the United States, South and East Asia (Woll, 1984; Woodward, 1978a, 1978b, 1993a, 1993b, 1996, 2000). The languages studied were categorized in to three types: unrelated languages, separate languages but stemmed from a parent language, dialects of a language.

Woodward’s methodology, based on the modified Swadesh word list for signed languages, determined genetic relationship based on the standardized method of lexico-statistics in historical linguistics (Woodward, 2000). Similar to other studies of lexical similarity, classification identified signs as identical, similar, and non-cognates on the basis of the shared resemblance of formational properties. Comparing similarities of the signed lexicon yielded four types categorized with respect to phonological and

¹⁵ This discussion presumably applies to standard “lexicalized” signs, not high iconic signs. If handness does change in a high iconic construction, then semantics is changed to something else.

morphological properties: phonological similar, morphological similar, no phonological similarity, or no morphological similarity. Phonological properties were defined according to the phonological parameters of a lexical unit. In cases of morphologically complex signs, both phonological and morphological properties determined if the signs were similar or not. To be classified as cognates, signs must be related by both phonological and morphological properties.

Findings in Woodward's 1978 study proposed that both American and French Sign Languages were closely related languages from the same language stock; however, the composition of American Sign Language appeared to be a convergence of a variety of indigenous signed languages in the United States and French Sign Language (Woodward, 1978b). Woodward (1993a) concluded that varieties of the sub-continent India (India, Pakistan, and Nepal) were separate but closely related languages, belonging to the same language family. Signed languages from East Asia (Hong Kong and Shanghai) were determined to be two closely related languages belonging to the same language family. While East Asian languages are distinct from the sub-continent of India, Woodward suggested they might originate from the same language stock (1993b). These studies overlap a similar framework comparing lexical data for mutual intelligibility and historical relatedness and similarity of formational and morphological properties of signs.

A unifying theme in studies of lexical similarity points out that similarity is higher in signed lexicon compared to spoken lexicon. Sasaki (2007) proposes the high percentage of similarity rests on Guerra Currie *et al.*'s explanation of *shared symbolism*, indicating "a pair of words happens to share the same motivation, whether iconic or

indexic (Guerra Currie *et al.*, 2002, p. 224)”. This concept of *shared symbolism* derives from Greenberg’s proposal of the emergence of similar words in different languages into four possible explanations: genetic relationship, language borrowing, chance, and symbolism (Greenberg, 1957). While genetic relationship and language borrowing involves historical aspects, chance and symbolism do not, and the challenge of lexical similarity studies is to discriminate which factors influence constructions similarly in signed languages. Since signed languages exploit iconicity as extremely productive constructions, resulting similar forms could possibly emerge independently in different signed languages. Sasaki (2007) and Guerra Currie *et al.* (2002) argued that similarity of forms drives higher degree of lexical similarity, known as *shared symbolism*. In turn, they propose that the higher propensity of lexical similarity correlates to a higher degree of iconicity manifested in signed languages as one of the factors.

Genetic and geographic relatedness in signed languages presents a challenge regarding the definition of language. What criteria sets a language apart from a dialect of a language? Differentiating languages from dialects among spoken languages of close genetic and geographic regions is problematic (Croft, 2003). Croft posits that to calculate a reasonable distribution of languages to sample, the population of languages in the world needs to first be determined (Croft, 2003). This cannot be resolved easily because of the difficulty of discriminating between a language and a dialect of a language (for both spoken and signed). The feasibility of determining genetic affiliation is dependent on the amount and quality of resources and methodological approaches embedded in the theoretical framework. In the area of signed languages, little knowledge about genetic

affiliation exists. Limitations rooted in underdeveloped principles of the comparative-historical study of signed languages affects ability to designate signed languages as members of language families and reconstruct proto-languages. The consequences of a very limited discussion of genetic relationship in signed language profoundly affect the emerging field of signed language typology (Zeshan, 2006).

Signed Language Research in Iconicity

Modality differences between spoken languages and signed languages are obvious. The visual-spatial modality of signed languages is particularly well-suited for exploitation of iconicity, the analogy between the form of a sign and its meaning; (E.g.: the American sign for *milk* realized with a squeezing fist represents the action of a person milking a cow.). Controversy revolves around the definition and the function of iconicity in terms of how it is manifested in signed languages. The history of signed language linguistics has felt intense pressure to verify signed languages as natural languages with all the structural and grammatical complexity encoded in arbitrary forms represented in spoken languages. As a result, past analyses found evidence of arbitrariness in signed languages, suppressing the inherent trait of iconicity of visual languages to justify signed languages to be full-fledged languages defined by the traditional view that languages express linguistic arbitrariness. The view taken by these analyses assumes that iconicity defines realizations that directly represent objects and events in the real world (Wilbur, 1987; S. Wilcox, 2004a). The traditional definition of a full-fledged language (comparable to spoken language) conflicts with the linguistic arbitrariness of signed languages expressed through iconic terms.

Iconicity is a complex, multi-faced property pervasive in all signed and spoken languages (Cuxac & Sallandre, 2007; Croft, 2003; Haiman, 1998; Grote & Linz, 2003; Pizzuto & Volterra, 2000; Russo, Giuranna, & Pizzuto, 2001; Taub, 2001; P. Wilcox, 2000; S. Wilcox, 2004a). Signed languages inherently exploit visual properties, conveying a rich source of meaningful elements that carry substantial information, suggesting they are more transparent in terms of iconicity than spoken languages (Armstrong 1983; Pietrandrea, 2002; Pizzuto & Volterra, 2000; Taub, 2001; P. Wilcox, 2000; S. Wilcox, 2004a; Zeshan, 2000). Morford, Adam, Iverson, Wilkinson, and Waters (in preparation) conducted a study of German and American signers to judge the degree of iconicity in both German and American signs, reporting that signers perceived their native signs as more iconic than translated equivalents of foreign signs. This finding suggests that iconicity is not self-evident, but interpreted on the basis of the language user's perception of the construal between a sign and its cultural referent, indicating a triad relationship (Morford *et al.*, in preparation).

Boyes Braem, Pizzuto, and Volterra (2002) found that signs perceived as cultural-specific may be understood only by some deaf and hearing non-signers, while other signs appear to be transparent to all deaf and hearing non-signers. They proposed that some signs' features are neutral of linguistic and cultural-specific properties, indicating the potential for their iconic-transparent features to be universally understood by human population at large. These studies support the claim Wilcox made that "the view that arbitrariness and iconicity are mutually exclusive derives from the assumption that iconicity requires full predictability: if a form is iconic, some would claim, then we

should be able to predict its form from its meaning, and vice versa (2004a, p. 140)”. As the Morford *et al.* study illustrates, iconic properties in both German and American Sign Languages were not fully predictable; therefore, iconicity and arbitrariness are not mutually exclusive as traditional analyses of signed languages have argued in the past.

Iconicity motivated in terms of conceptual frameworks scaffold interpretations specified by language and culture. The signed lexicon contains a continuum of referential points based on some degree of iconicity and arbitrariness in signed forms (Adam, Iverson, Morford, & Wilkinson, 2007; S. Wilcox, 2004a). The degree of iconicity in the phonological structure is determined by how signers construe the relationship between the phonological and semantic properties of a sign. Wilcox (2004a) describes the representation of a symbolic structure (sign) as the encoding of semantic and phonological properties within a single multi-dimensional conceptual space, driving the perception of the iconic relationship between the form and meaning. Wilcox (2004a) suggests that “the iconic relation is between construals of real-world scenes and construals of form”, proposing ‘*cognitive iconicity*’ as the distance between scaled, mapping relations of construals. Studies suggest that language systems include a referential continuum based on the interaction of iconicity and arbitrariness instead of viewing them as rigidly defined (absolute) exclusive properties of language systems (Adam *et al.*, 2007; Antinoro Pizzuto, Rossini, Sallandre, & Wilkinson, 2008a; Cuxac & Sallandre, 2007; Grote & Linz, 2003; Pizzuto & Volterra, 2000; Russo, Giuranna, & Pizzuto, 2001, Taub, 2001; P. Wilcox, 2000; S. Wilcox, 2004a).

This notion of the continuum of iconicity and arbitrariness is also discussed in an study on 1,944 Italian signs differentiated by handshape and location, finding that half of the data corpus revealed handshape is iconically motivated (Pietrandrea, 2002). Two thirds of signs that were located on the body of the signer are also iconically motivated, suggesting signs do exploit iconicity for rich production of lexicon in Italian Sign Language. Although iconic properties are pervasive in Italian signs, these signs also realize arbitrary properties based on the selection and combination of articulator features to represent different meanings. Pietrandrea found no correlation between semantics and the space rendered in the neutral space, indicating that signs situated in neutral space are less motivated by iconicity. As a result, signs are neither purely iconic nor arbitrary, but demonstrate a continuum through an interface of iconicity and arbitrary properties determined by the Italian lexicon in response to the competition between iconicity and linguistic economy (Pietrandrea, 2002).

These aforementioned analyses scaffold how kinship terminology will be analyzed in this study to account for the possibility that kin terms may encode specific semantic-phonological relationships motivated by iconic properties. Iconic properties of metaphoric and metonymic features convey meaningful components within linguistic form. Productively constructed in signed languages, metaphoric and metonymic forms reveal salient features determined by linguistic members to represent given concepts (Taub, 2001; P. Wilcox, 2000; P. Wilcox, 2005). These iconic properties as well arbitrary properties can be expected to emerge predictably in analyses of signed language kinship terminology.

Discriminating Phonology from Morphology in Signed Languages

Motivation in sign formation differs largely from word formation in spoken languages due to properties of phonology and morphology. Discriminating phonology from morphology in signed languages is more difficult than it is in spoken languages (Frishberg, 1975; Emmorey, 1996; Liddell, 2003; Lucas & Bayley, 2008; Pizzuto & Corazza, 1996; Russo *et al.*, 2001; others). Modality differences shape how spoken and signed languages are constructed phonologically, morphologically, and syntactically (Emmorey, 1996; Liddell, 2003; Lucas & Bayley, 2008). Spoken forms convey phonological features sequentially, while the phonological form of a sign simultaneously embeds articulatory features along a temporally sequenced path of movement. Articulatory features in the phonological form of a sign are traditionally identified according to hand configuration, location where the sign is realized in the signing space, and pattern of movement. Morphological structures in spoken languages are sequentially formed of a combination of a word stem and affixes, whereas morphological components are manifested through an alternation of one (or more) phonological feature¹⁶. Where a phonological feature is alternated into a different phonetic realization, a contrastive meaning is signified. For instance, in spoken German, phonological alternations are

¹⁶ Emmorey (1996) and Lucas and Bayley (2008) claim that “simultaneous affixation processes are rarely observed in spoken languages”; however, Bybee finds that these morphological processes are not that uncommon as traditionally believed. E.g. morphological alternations in English: /t/ vs. /d/ in English past tense [-ed] (Bybee 2001).

manifested in three different conjugated verbs for ‘give’, illustrating contrastive marking of tense: *geben* (infinitive), *gibt* (3p sg present), *gab* (3p sg past). In contrast, morphological processes in signed languages are nonconcatenative, that is not sequential, and a morphologically complex sign is produced with affixes and stems occurring simultaneously in a holistic form (Emmorey, 1996; Lucas & Bayley, 2008).

Cuxac and Sallandre (2007) revealed that even the most imagic forms of iconicity are organized in macro-structures composed of morphemic elements. A unique mechanism devised by the visual-gestural modality constructs compositional morphemic elements by exploiting different parts of the signer’s body as a multi-linear expression defined as highly iconic structures (HIS). While a manual sign is composed of different morphemic units, the multi-linear organization of compositional morphemic elements also involve eye-gaze to specify a referent, along with facial expression and the movements employed by the face and the body. Furthermore, the behavior of eye-gaze differentiates standard signs from highly iconic constructions (Cuxac & Sallandre, 2007; Cuxac & Antinoro Pizzuto, 2007). Antinoro Pizzuto *et al* (2008a) describe the function of eye-gaze as a determinant of the grammatical categorization of signs:

Standard signs are preceded or accompanied by eye gaze directed towards the interlocutor, whereas HIS are marked by gaze patterns directed towards the hands (in the production of two major subtypes of HIS [Highly Iconic Structure] characterized as Transfer of Form [TF] and of Situation [TS]), or via a gaze which mirrors the gaze of the

referent(s) represented, in producing a third major type of
HIS characterized as Transfer of Person (TP). (p. 4)

The role of eye-gaze associated with ‘face-to-face’ communication clearly contributes to greater understanding of linguistic behaviors during signed language discourse, suggesting the function of eye-gaze may be a modality-specific linguistic element. Taking into account the specific role of complex visual-gestural elements with respect to the function of eye gaze, signed languages form words and sentences differently than that observed in spoken languages—grounding a new ‘non-assimilationist’ perspective that appreciates modality-specific signified elements unique contribution to signed languages.

Prior work in morphological analyses focused primarily on verbal constructions of aspect and agreement, nominal forms derived from verbal constructions, and complex sign units that have been characterized as of highly iconic structures¹⁷ (Emmorey, 1996; Klima & Bellugi, 1979; Padden, 1990; Pizzuto, Giuranna, & Gambino 1990; Supalla, 1990; Supalla & Newport, 1978; Wilbur, 1979). Emmorey (1996) describes morphological complexity in signed languages:

In ASL and other signed languages, complex forms are most often created by nesting a sign stem within dynamic movement contours and planes in space. . . . ASL has many verbal inflections that convey temporal information about the action denoted by the verb,

for example, whether the action was habitual, iterative, or continual. Generally, these distinctions are marked by different movement patterns overlaid onto a sign stem...Sign languages' preference for simultaneously producing affixes and stems may have its origin in the visual-manual modality (Emmorey, 1996, p. 173).

If a standard sign depicts phonological alternations in movement, affecting the meaning of the sign, then movement is a morphological structure. Wilcox (2004a) argued that movement in verbal construction is motivated iconically, proposing that movement carries a higher degree of semantics beyond being simply a formal property.

Movement also functions as metaphorical schemas. Taub (2001) describes how a conceptualized framework of time exploits movement, as a single spatial dimension, construed in space in American Sign Language. The sagittal direction of the movement is meaningful in relation to the proximity of the body of the signer whereas the signer functions as a reference point in space. The instantiation of a sign moving forward refers to *future*, depicting *future* as a conceptualization of the person looking ahead. Signs realized behind the signer's reference point construe events that occurred in the *past*. If the sign situates in near proximity to the signer and is expressed with no movement or a slight forward movement, then it denotes *present*. For instance, a citation form of WEEK is realized in a near proximity of the signer with no movement (or a slight forward movement), representing *present*. Mapping the conceptualization of *future* to WEEK

constructs NEXT-WEEK, while LAST-WEEK exploits the movement to move back. This metaphorical schema frames a *time line*, which is seen in other signed languages (Danish: Engberg-Pedersen, 1993; Italian: Pizzuto, Cameracanna, Corazza, & Volterra, 1995). These studies suggest that movement carries a meaningful element; moving beyond the conventional view that movement is a phonological feature but also is likely to encode a meaningful component in a sign.

Wilcox (2000) compares the handshape of a straight index finger and a bent index finger in American Sign Language, finding schematicity in American signs. Proposing a metaphorical schema of IDEAS IN EXISTENCE ARE STRAIGHT and IDEAS NOT FULLY IN EXISTENCE ARE BENT, Wilcox argues that the index finger as a formational property maps to a metaphorical schema specified in cognitive-denoted American signs (e.g. THINK (straight finger) versus THOUGHT-DISAPPEAR (straight becomes bent finger). Comparing two lexical signs, SUSPECT and RED, with the same formational property of a bent finger, Wilcox (2000) notes that SUSPECT is motivated by the schema of IDEAS NOT FULLY IN EXISTENCE ARE BENT where the thought is inconclusive, a feature which is metaphorically encoded through a bent finger. Although RED shares the same bent handshape, it does not exploit the same metaphoric mapping of SUSPECT because RED represents a different meaning of a different, specific domain. This finding is also noted in the semantics evoked by the phonological form of a pinky finger in a set of American signs, suggesting that the exploitation of the pinky finger conveys the diminutive property of smallness for word play or, as Cagle described-- puns with the pinky finger (Cagle, 2004). Examination of semantics in signs determines what formational features

appear to mark specific semantic and morphological properties, either motivated by iconicity, metaphor, and/or arbitrariness.

Frishberg (1975) describes the morphological formation of signs occurring when a class of signs contains similar phonological parameters conveying semantic relatedness. Frishberg discusses a set of American signs that realize male-female distinction by referring to males on the forehead and females on the cheek; constructing a morphological class that preserves similar forms with “phonological parameters potentially carrying meaning” (1975, p. 714). American signs denoting the semantic property of maleness are realized on the forehead; however, other semantically unrelated signs such as COW and KNOW, also realized on the forehead, do not share the same property of maleness expressed in American signs kinship terminology. The signs of COW and KNOW are motivated differently. The sign COW is metonymically represented through an iconic form of *a cow’s horn*, exploiting the location to indicate where the horn is situated through a mapping to the forehead of the signer’s head. As for the sign KNOW, the location is metaphorically construed to the domain of cognition (the brain) in American Sign Language (P. Wilcox, 2000). Studies show that visual-gestural languages exploit iconicity to construct a paradigmatic set of metaphorical constructions (Brennan, 2002; Jarque, 2005; Russo *et al.*, 2001; Taub, 2001; P. Wilcox, 2000).

Wilcox proposed that ASL phonemes and morphemes are isomorphic on the basis that the corresponding form (E.g. handshapes) realized is structurally identical—but the framework of the isomorphic form is determined by the schema, either iconic or metaphorical conceptual relationships (P. Wilcox, 2005). Gee and Kegl (1982) express

the view that the morphological representation of ASL signs is also morphophonemic due to finding that each phoneme functions as a morpheme. They view this property as an isomorphism to function as a mediation between its phonetic and its semantic properties. These aforementioned studies corroborate to Boyes-Braem's (1981) proposal that the formational property of handshape inherently encodes a semantic property, arguing that handshape is not a distinctive feature but instead a significant feature. In turn, the formational properties are not simply phonemic representations but also may embed semantic properties representing iconic schemas. Similar findings are discussed in studies of other signed languages (Pizzuto *et al.*, 1995; Brennan, 1990).¹⁸ Examination of semantics in signs determines what function formational features encode by the markings of specific semantic and morphological properties, either motivated by iconicity and/or arbitrariness.

To determine morphological properties, formal patterns must be observed in a set of signs sharing similar semantics. In contrast, the similar formal morphological properties within a specific set of signs may not function as similar morphological properties in other semantically unrelated signs. Simply said, phonological properties of a sign are formally realized—with no significance beyond the phonological level, but

¹⁸ The study by Pizzuto, Rossini, Russo, and Wilkinson (2005) explored the problems of noun-verb distinctions in Italian Sign Language, when it is marked, when not, and with the broader problem of characterizing complex, highly iconic structures.

sometimes the phonological property could be semantically signified and viewed as morphological. In some cases, the phonological property is rather a morphophonological property that derives meaning motivated by either iconicity and/or arbitrariness. This *sign symbolism* appears to be analogous to *sound symbolism* in spoken languages (Croft, personal communication). What becomes more challenging is when signs are structured with a similar phonological property. The specified formational property may be simply phonological, or the formational property may carry more semantic value analyzed either as a semantic property or as a morphophonological component. This analysis appears to be domain-specific. However, limited knowledge exists about this particular issue. Many questions remain unanswered about phonological patterns with respect to morphology and semantics. For instance, is there any evidence where a specific formational property encodes different semantic and morphological properties? Although very little in this domain has been investigated, this appears to be potentially true according to previous studies (Boyes Braem, 1981; Emmorey, 1996; Klima & Bellugi, 1979; Padden, 1990; Pizzuto & Corazza, 1996; Taub, 2001; P. Wilcox, 2000, 2005). The problem of discriminating phonological features and morphological components in signed languages merits reconsideration. Hope is that further insights will be derived from in-depth explorations of formal properties across different lexical and grammatical domains of signed languages (Boyes Braem, 1981; Emmorey, 1996; Pietrandrea, 2002; Pizzuto & Corazza, 1996; Taub, 2001; P. Wilcox, 2005; S. Wilcox, 2004a).

Greenberg's Universals of Kinship Terminology

The domain of kinship terminology is one of the most enduring parts of the lexicon of all languages (Greenberg, 1990). Greenberg examined 120 spoken languages seeking patterns in kinship terminologies, and positing universals of kinship terminology. The evidence Greenberg found exploring the principles of unmarked and marked categories of kin terms led to a theory of markedness, illustrating universal hierarchies characterized by markedness. Typologies of kinship terminologies were derived from the principles of the markedness theory.

Greenberg examined patterns in kinship terminology that determined the criteria used to define the principles of markedness theory, which differentiates unmarked from marked kin terms. The concept of markedness derives from phonology where marked forms express more complex phonological realizations to qualify meaning than unmarked forms (E.g. spoken Spanish: marked form *bisabuela* 'great-grandmother' compared to unmarked form *abuela* 'grandmother') (Greenberg, 1990).

The term *marked* may be used for two purposes. The first function of *marked* entails the notion that the kin term involves more structural coding of additional phonetic elements, and less categorical distinction. Comparing spoken English terms of *sister-in-law* and *sister*, *sister-in-law* is marked because the term has more structural coding compared to *sister*. Furthermore, *sister-in-law* may refer to Ego's spouse's sister or Ego's brother's wife. In turn, *sister-in-law* encodes a broader category of kin relations (with less distinction) as compared to *sister* which clearly specifies the conceptualized description of Ego's blood-related kin member who share same parents. Secondly, the term *marked*

is employed when a kin term specifies properties such as gender, relative age, and so forth. For instance, Norwegian kin term *mormor* ‘mother’s mother’ is marked for gender and maternal affiliation compared to Italian kin term *nonna* ‘grandmother’ entailing only gender distinction, but does not specify parental affiliation. In turn, the use of the term *marked* may either refer to overt phonetic realization (structural coding) or distinctions such as semantic properties.

Universal hierarchies of kinship terminology categorize markedness according to four types: structural coding, more distinctions in unmarked category than marked category, absence of distinctions in the marked category (defectivation), and text frequency (Greenberg, 1966, 1990). While unmarked kin terms express no overt structural coding, marked terms realize a structural coding with an overt phonetic realization shown in the kin term. In English, the affinal term *sister-in-law* expresses more structural coding by appending to mark the term with the suffix *in-law* as compared to the unmarked, consanguineal term *sister* with no additional phonetic sequences, indicating zero expression of structural coding. Greenberg also found that zero expression of structural coding indicates higher text frequency occurrences of unmarked kin terms, alluding to Zipf’s (1929) analysis that more frequent terms are reduced to phonetically short forms compared to less frequent terms. In contrast, marked kin terms are typically less frequent and correlate with expressions of overt structural coding as compared to unmarked terms with fewer (or no) overt structural coding (Greenberg, 1966, 1990).

An asymmetric pattern of kin terms illustrates a paradigm of unmarked terms expressing more distinctions than marked terms. For example, all lineal terms in English

encode distinction in gender, e.g. *daughter* and *son*, characterizing English lineal terms as unmarked. The collateral term *cousin* collectively refers to both male and female kin, illustrating neutralization of gender reference compared to unmarked lineal terms in English, illustrating the asymmetry of this kin term paradigm expressing more distinctions in the unmarked category than in the marked category. The marked category may also shows an absence of distinctions (Greenberg calls this defectivation) in the paradigm where an intersecting category (E.g. gender) is not formally encoded, unlike what happens in unmarked terms (Greenberg, 1966, 1990). For instance, an English kin term such as *cousin* has no distinction in gender, in contrast to other English kin terms such as *aunt* and *uncle* where distinction of gender is seen. The marked terms involve less distinctions and overt structural coding while unmarked terms have more behavioral potential (Croft 2003) by containing more distinctions and zero expression in structural coding.

Examination of kin terms of equal generational distance with reference to Ego demonstrates a difference in marking with respect to the hierarchy of generational category. Ascending kin terms are unmarked as opposed to marked descending kin terms. In Logoli, a Kenyan community of Bantu speakers expresses gender distinction in second ascending lineal terms such as *guga* ‘grandfather’ and *guku* ‘grandmother’, while the second descending lineal term of *omwitjuxulu* ‘grandchild’ is not discriminated by gender. Along with gender distinction, the seniority of generation as another factor is evident in sibling terms where relative age with a reference to Ego functions as a distinction in older siblings, which are unmarked, while younger siblings lack distinction

regarding gender and relative age—indicating a marked category. For instance, Malay differentiates by gender and relative age in older sibling terms as designated: *abang* ‘older brother’, *kakak* ‘older sister’, while the designated term for younger sibling term express neutralization of gender: *adik* ‘younger sibling of either gender’.

Kin types of generational kin terms are evaluated based on the remoteness of distance to Ego. The more remote the distance to Ego, the more marked are kin terms, in contrast to less remote distance kin terms that remain unmarked. For instance, in English, the marked term of the second ascending lineal term *grandmother* is expressed with structural coding of an overt phonetic realization of *grand* seen with the unmarked first ascending term *mother*. Greenberg describes the hierarchy of generation in kinship terminology by markedness as follows (Greenberg: 1966: 77):

First ascending > Ego’s generation, first descending > second
ascending > second descending > third ascending > third descending

First ascending kin terms are always less marked than other hierarchies. The Ego’s generation (siblings) is the next least marked category, yet may be more marked than parental terms. The category of third descending kin terms (e.g. great-grand-child) is most likely to be marked by expressing more complex linguistic elements than all other generational kin terms. Greenberg found patterns of complexity in linguistic elements corresponding to the hierarchy of generational kin terms across spoken languages; leading to the development of kin types that stem from this analysis of generational kin terms.

Greenberg's (1966) posited universals of hierarchies illustrate marked and unmarked categories as follows (Table 2):

Table 2

Greenberg's markedness theory and hierarchies of categories

Unmarked		Marked
Consanguineal	>	Affinal
Ascending (G+*)	>	Descending (G-*)
Lineal	>	Collateral
Less remote generation	>	More remote generation

Greenberg argued that all languages' kinship terminology express more or less in the line of generation discriminating by remoteness and equal distance, and differentiating between consanguineal and affinal relations. These categories are organized by hierarchy observed in unmarked and marked kin terms. Analysis of markedness theory reveals evidence of linguistic regularities in constructing kinship terminology, lending credence to this notion in typologies of kinship terminology (Greenberg, 1966, 1990).

Greenberg proposes three types of typological markedness of kinship terminology, arguing that the classification of kinship terminology is revealed in hierarchies' categories of marked and unmarked kin terms. The first typology involves parental terms. The second concerns parental and parents' sibling terms, and the third

concerns the typology of grandparental terms. These typologies are defined along with Greenberg's findings regarding which types appear to be more commonplace.

The first analogous typology introduced a simple set of kin terms for *father* and *mother*. Greenberg presented two kin types, as illustrated in Table 3 (1966, p. 84):

Table 3

Greenberg's description of kin types of parental terms

	A	B
Type 1	father	mother
Type 2	father, mother	

6)

7) *Type 1*: Two separate terms to denote father and mother

8) *Type 2*: One term to denote father and mother

Greenberg found that all languages (by which he meant spoken languages) belong to Type 1, because all languages have two separate terms for *father* and *mother*. Based on this finding, Greenberg posited that the discrimination of gender of parents is universal.

The second typology concerns kinship systems classified by parental and parents' sibling terms. Greenberg discussed four types of kinship terminology for a set of males of the first ascending generation: *father*, *father's brother*, and *mother's brother*. These four relationships were categorized according to generational, lineal, bifurcate collateral, and

bifurcate merging types (pp. 83-84). Each type defined by Greenberg in Table 4 as follows

Table 4

Greenberg's kin types of kin terms of father, father's brother, and mother's brother

	A	B	C	Type
Type 1	Fa, FaBr, MoBr			Generational
Type 2	Fa	FaBr, MoBr		Lineal
Type 3	Fa	FaBr	MoBr	Bifurcate collateral
Type 4	Fa, FaBr	MoBr		Bifurcate merging
Type 5	Fa, MoBr	FaBr		Unknown

9)

10) *Type 1 (generational type)*. All three of these relatives are referred to by the same terms.

11) *Type 2 (lineal type)*. The father is distinguished from the two collateral relatives, which are merged in a single uncle term.

12) *Type 3 (bifurcate collateral type)*. All three terms are designated by separate terms.

13) *Type 4 (bifurcate merging type)*. The paternal line relatives, father and father's brother, share the same term, while a second term is used for the mother's brother.

14) *Type 5 (unknown)*. The father and mother's brother are designated by the same kin term, while the father's brother is given a separate kin term.

Although there are four types observed in spoken languages, Greenberg incorporated another type, Type 5, which was the logical possibility of having a designated kin term for the father and mother's brother and a separate kin term for father's brother. Greenberg found no evidence of any languages that fit in Type 5; therefore the type is identified as unknown or in other words, unattested.

The third typology involved classificatory systems of grandparental terms, categorizing into 15 logically possible types. These 15 types are based on four kin relations in the second ascending lineal terms: *father's father*, *father's mother*, *mother's father*, and *mother's mother*. These types were examined by the set of 120 languages Greenberg collected to determine which type was attested or unattested. Attested types were categorized either as common or occurs (reflecting not as common but is attested). In Table 5, each type is described as follows:

Table 5

Greenberg's kinship typology of grandparental terms in 120 spoken languages

	A	B	C	D	Greenberg's judgment
Type 1:	FaFa, FaMo, MoFa, MoMo				common
Type 2:	FaFa, FaMo	MoFa, MoMo			occurs
Type 3:	FaFa, MoFa	FaMo, MoMo			common
Type 4:	FaFa, MoMo	FaMo, MoFa			not found
Type 5:	FaFa	FaMo, MoFa, MoMo			not found
Type 6:	FaMo	FaFa, MoFa, MoMo			not found
Type 7:	MoFa	FaFa, FaMo, MoMo			not found
Type 8:	MoMo	FaFa, FaMo, MoFa			occurs

Type 9:	FaFa, FaMo	MoFa	MoMo		occurs
Type 10:	FaFa, MoFa	FaMo	MoMo		occurs
Type 11:	FaFa, MoMo	FaMo	MaFo		not found
Type 12:	FaMo, MoFa	FaFa	MoMo		occurs
Type 13:	FaMo, MoMo, FaFa		MoFa		not found
Type 14:	MoFa, MoMo	FaFa	FaMo		not found
Type 15:	FaFa	FaMo	MoFa	MoMo	common

Note: The definitions of abbreviations with reference to grandparental terms are given: FaFa: father's father; FaMo: father's mother; MoFa: mother's father; MoMo: mother's mother

Greenberg concluded that out of 15 possible types, only three types were common (Type 1, Type 3, and Type 15) and other five types were also attested in kinship terminology (Type 2, Type 8, Type 9, Type 10, and Type 12). The interesting insight about this analysis is that only eight types are attested out of fifteen logically possible types, suggesting constraints of what kin terms may collectively refer to kin relations.

Analyses of typologies of kinship terminology revealed that there exist hierarchies within categories with respect to structural coding and distinctions of consanguineal and affinal, lineal and collateral, and generation by remoteness and equal distance. Greenberg's postulated theory of markedness and typologies of kinship terminology

represent the prevailing wisdom of linguistic typology and serve as a preeminent model for this study.

Studies of Kinship Terminology in Signed Languages

Although studies of signed languages have grown in recent years, linguistic descriptions of signed kinship terminologies remain largely neglected in signed language research except for a small sub-set of signed languages. Descriptions of kinship terminologies have been examined in American Sign Language (Frishberg, 1975), Adamorobe Sign Language (Nyst, 2007), Argentinean Sign Language (Massone & Johnson, 1991), and Japanese Sign Language (Peng, 1974; Sasaki, 2007). Analyses present two similar findings. Kinship terminology studied was systematically constructed and categorized in either descriptive or classificatory terms. Also, signed kinship terminology was found to be not completely congruent with the kinship terminology of the surrounding spoken language despite the fact both deaf and hearing members co-exist in a shared kinship system. Peng (1974) observed that deaf Japanese express *father* and *father-in-law* with two different signed constructions while both kin relations are addressed by the same term of *otosan* ‘father’ in spoken Japanese. Nyst (2007) stated that signed languages generally employ kin terms as only referentials but not vocative terms. Vocative terms function when signers use kin terms to address their family members (E.g. a child signs to his mother: “Mom, I want a cookie”). This was also noted in Japanese Sign Language that kin terms are not used when deaf Japanese address to their kin members but instead call attention to initiate conversation by tapping on shoulder, indicating Japanese deaf do not use kin terms in a vocative function (Peng, 1974).

In studies discussing constructions of kin terms and their patterns within language-specific systems, Nyst (2007) described nine kin terms of Adamorobe Sign Language: *mother*, *father*, *grandparent*, *child*, *younger sibling*, *birth*, *marry*, *same* and *family*. All terms extend semantically from more general terms except for *younger sibling*. The person term of *woman* may function as a kin term of *mother*, and this principle applied to *father* with *man*, illustrating paternal terms were semantically extended from person terms. The expression of *white-hair* (*white* is mouthed while signing *hair*) encodes the meaning of an old person, which extends metaphorically to represent *grandparent*. The term *child* may mean either a youngster or someone's offspring.¹⁹ The form of *birth* refers to the event of giving birth and also semantically extends to *offspring*.²⁰ *Spouse* is conveyed through the form of *marry*. To refer to *siblings*, *cousins*, and *friends*, these collateral and non-familial relations all cluster together by incorporating the form of *same*. Adamorobe kin terms demonstrate an interesting pattern of discourse-dependent, semantic extensions.

Except for the spousal term, Adamorobe kin terms express consanguineal relations, where lineal kin discriminate three tiers of generations of children, parents, and

¹⁹ The form of *child* is represented with an arm and a closed fist situated in the neutral space, representing the child's head and body. The form may be modified to denote plural and a child's physical growth depicting an increase in height (Nyst 2007). To indicate the relative age of the child, either modifying terms of elder or younger would follow the term *child*.

²⁰ It is unclear how the function of *child* and *birth* represents offspring except that *birth* seems to encode one's own offspring while *child* appears to be a generic representation of anyone's offspring.

grandparents. Parental and lineal term categories are expressed as unmarked, and parental terms are discriminated by gender, paralleling Greenberg's discovery that gender distinction is universal in parental terms and unmarked compared to other kin categories. Of all terms, the kin term of *younger sibling* was the only kin term that conveyed a specific relation as a collateral term encoding age relative to Ego. This finding countered Greenberg's claim that collateral terms are more marked compared to lineal terms. The term *younger sibling* appeared to be unmarked as opposed to unspecified Adamorobe lineal kin. Also, this counters to the markedness hierarchy with respect to the seniority of age in sibling terms where a distinction of relative age is indicated in younger siblings, not in older siblings. Nyst compared Adamorobe kin terms with spoken Akan kin terms, finding Adamorobe kin terms did not express matrilineal affiliation such as descriptive terms for paternal aunt, maternal uncle, and their off-springs seen in spoken Akan kin terms. Differences in kinship terminologies show incongruence, although Adamorobe signers and Akan speakers co-exist in the same kinship system (Nyst, 2007).

In Argentinean Sign Language, kin terms organize according to a lineal system, discriminating kin relations on the direct generation line by Ego as a reference point. References to grandparents and grandchildren use a similar kin term, denoting a reciprocal function by referring to each other by the same kin term.²¹ This reciprocal

²¹ Massone and Johnson (1991) mentioned that the kin terms for grandparents and grandchildren are similar but that forms demonstrate a slight modification, differentiating between two kin terms. Although the description of the modification was not given, it raises an important question regarding the

function was also observed in kin terms of *uncle* and *nephew*. The presence of reciprocity in kinship terminology suggests an emerging cross-generational reciprocal system in Argentinean Sign Language (Massone & Johnson, 1991).

Except for two kin terms referring to first ascending and first descending kin members, all collateral and close affinal relatives are expressed with one classificatory term without reference to gender or generation. The classificatory term of *collateral relative* appears to motivate the constructions of first ascending and first descending collateral terms (E.g. *uncle*, *aunt*, *niece*, *nephew*), undergoing a derivational process. It was possible that Argentinean signers could convey a specific relation. For instance, the concept of *sister-in-law* may be expressed in a descriptive construction of four signs: [*my sibling his spouse*]. This type of referential construction occurs infrequently in discourse compared to the use of the classificatory term (Massone & Johnson, 1991).

Massone and Johnson's study (1991) discussed linguistic influence from Spanish orthographic representations in Argentinean kinship terminology, motivating two linguistic processes. The first process concerned lexical borrowing by fingerspelling kin terms of TIO 'uncle' and NIETO 'grandchild'; however, it remained unclear how these fingerspelled forms function in discourse compared to other non-fingerspelled forms. The second process involved morphological borrowing of Spanish gender marking by realizations of initialized forms. Although not an obligatory function in Argentinean

assumption that the modification refers to formational properties, leaving unresolved what property is responsible for lexical differences between grandparents and grandchildren.

kinship terminology, gender marking may occur in the final position of a construction by realizing either initialized handshapes of ‘A’ or ‘O’ for female and male kin referents. The function of initialized gender marking was only seen in the domain of kinship terms, and not in other nominal constructions of Argentinean Sign Language. This behavior illustrates a pattern not seen in spoken Spanish where gender marking is obligatory in nominal constructions.²² Gender marking gender specific to the domain of kinship terminology have also been noted in American Sign Language, where location functions as gender marking.

Peng’s 1974 study found Japanese Sign Language construct kinship terminology into two sets: basic signs and derivative signs. The first set involved only lineal and nuclear kin terms discriminated by gender, age, generation, and consanguinity. Handshape marked gender in Japanese kin terms. The thumb marked first and second ascending male kin, and the pinky finger denoted first and second ascending female kin, a pattern that also applies to spousal terms. Grandparental terms differed from parental terms by a bent finger and a circular movement. Siblings contained two types of markings: gender and age. Siblings were discriminated by gender of a middle finger referring to male siblings and a ring finger for female siblings. Sibling kin terms marked the age of referent with respect to the Ego as a reference point. Older siblings conveyed an upward movement while a downward movement referred to younger siblings. Except

²² Other domains of nominal constructions would express gender terms with signs of *female* and *male* in Argentinean Sign Language (Massone & Johnson, 1991).

for offspring and spousal terms, all kin terms construct with *blood relation* in the initial position of two-componential constructions, denoting consanguineal relation. Peng argued that lineal and nuclear kin terms function as classificatory terms because these kin terms convey through basic signs. Peng's definitions contradict Parkin's (1997) definitions with respect to descriptive and classificatory terms, potentially confusing interpretations of Peng's analysis of Japanese kin terms.

Descriptive terms manifest in derivative Japanese Signed Language collateral and affinal kin terms. Peng described a derivative sign as two or more basic signs combined into one construction. For instance, *father's younger brother* is represented with two basic signs of *father* and *younger brother*. While older deaf Japanese retain the full realization of both forms, the younger deaf Japanese drops the consanguineal component in both forms in the derivative construction. The absence of the consanguineal component semantically depicts [*male*] [*young* + *male-sibling*] in the construction of *father's younger brother*. Derivative signs combine multiple basic signs totaling 36 different constructions as compared to 11 basic signs. Peng argued that the relationship between of a basic and derivative sign corresponds to the relationship between a classificatory and descriptive term.

Comparing the inventory of kin terms of Japanese Sign Language to spoken Japanese kin terms results in unmatched terms. In spoken Japanese, six classificatory terms are not represented in Japanese basic signs, including *ojisan* 'uncle', *obasan* 'aunt', *oi* 'nephew', *mei* 'niece', *itoko* 'cousin', and *mago* 'grandchild'. This illustrates how two

different linguistic groups who share a similar cultural system do not necessarily express similar representations of kin terms (Peng, 1974).

Studies of Adamorobe, American, Argentinean, and Japanese Sign Language reveal several important trends in signed language kinship terminology. Signed languages construct kin terms based on systematic patterns, demonstrating a range of structural variation. While signed and spoken languages typically co-exist in similar cultural systems, studies illustrate how signed language kinship terminology is not entirely congruent to the system of kinship terminology of surrounding spoken languages.

Woodward's Revisit of Greenberg's Language Universals of Kinship Terminology

Woodward (1978a) examined the distribution of kinship terminologies in twenty signed languages to compare his analysis with Greenberg's to examine the implications of language universals of spoken language kinship terminology on signed languages. Woodward concurred with all implications Greenberg proposed except for three generalizations as defined in Woodward's analysis. Since this paper is the only known study of signed languages that has directly addressed the language universals of kinship terminology postulated by Greenberg, this paper merits detailed discussion.

The methodological approach Woodward employed resulted in findings that were not persuasive and inconclusive. Woodward's analysis of twenty signed language containing monomorphemic or polymorphemic lexicon denoting consanguineal relations; identifying them as *native basic kin terms*. While there were no definitions of monomorphemic and polymorphemic constructions in the paper, the study disregarded any kin terms that were constructed of more than one lexical unit. For instance, the

Russian collateral term *cousin* was excluded, because its construction includes two lexical units that translate as *second sibling*. Woodward excluded all kin terms that demonstrate evidence of external linguistic influences borrowed from the surrounding spoken language such as initialization and mouthing components, characterized as *foreign kin terms*. Elicitation of data of kinship terminology was not addressed in this paper—so it is unknown whether data was collected through written languages or pictorial representation of kin members and/or kinship relationships. Rather than incorporating all kin terms expressed in the language, Woodward based his methodology on linguistic effects, seriously limiting the generalizability of this study by imposing arbitrary selection criteria, and not fully analyzing the kinship terminology in signed languages.

Another crucial issue concerns sources of signed languages. Woodward hypothesized linguistic relationships among twenty signed language varieties, categorizing them into six sets. Ten signed languages were typologically Western.²³ As for other five sets, three varieties were categorized as Asian²⁴, two South American²⁵, two

²³ The set of Western signed languages included Old American, Modern American, Formal Australian, Informal Australian, British, Danish, Old French, Modern French, Old Catholic Scottish, and Modern Scottish.

²⁴ The set of Asian signed languages included Japanese, Taiwanese, and Hong Kong.

²⁵ The set of South American signed languages included Colombian and Costa Rican.

Indigenous²⁶, and three as unknown affiliations.²⁷ Woodward mentioned that the set of unknown affiliation languages experienced contact with other signed languages by importing language influences from America and Europe, suggesting potential unspecified linguistic relationships between unknown affiliations and Western varieties. In the set of Asian signed languages, the relationship between Japanese and Taiwanese Sign Languages was noted as closely related. Analysis included formal and informal registers of Western signed languages, justified by the continuum of diglossic use, illustrating a variety of realizations of kinship lexicon with respect to the types of interaction with interlocutors (E.g. contact with hearing people and educational settings where spoken languages were primarily experienced). However, formal and informal registers were included to take into consideration the differences in register reflecting what had been preserved of older formal forms while conveying newer informal forms. Although Woodward recognized some signed languages were closely related, he argued that systems of kinship terminology differed to some extent in these related languages. This language sampling does not appear to be representative of a large sampling of genetically related signed languages; especially since linguistic relationships were hypothesized (Woodward, 1978a).

²⁶ The set of Indigenous signed languages included Adamorobe in Ghana and Providence Island in the Caribbean.

²⁷ The set of unknown affiliations included Egyptian, Indian, and Malaysian.

Although Woodward's study did not inform the token count of basic native kin terms, the token count could be drawn from the kinship term data map, totaling to 114 kin terms for twenty signed language varieties (p. 128). The number of kin terms selected from these signed language varieties ranged from three to twelve. The highest reported number of kin terms in a given signed language variety was Japanese and Taiwanese Sign Languages with twelve kin terms each. The smallest reported kinship terminology was shown in both Modern French Sign Language and formal Australian Sign Language with three kin terms. The token count of basic native kin terms is unsurprisingly low due to the selective methodology adopted that excluded terms with external linguistic influences and kin terms composed of multiple lexical units. This was noted in Nyst's (2007) analysis of Adamorobe kin terms, contesting Woodward's count of four terms where Nyst identified nine kin terms.

Woodward's findings showed signed languages contained terms representing kin relations. This collection of basic native kin terms revealed that nearly all signed languages had a small set of kin terms primarily representing nuclear relations: *offspring*, *father*, *mother*, and *sibling*. Formal Australian, British, and Modern Scottish Sign Languages expressed no lineal kin terms denoting parents and grandparents. All signed languages contained a sign denoting an offspring; however, none of the offspring terms were differentiated by gender. Within the category of non-lineal terms referring to siblings and second ascending kin terms (E.g. grandparents), signed languages demonstrated variation in gender and age of referent. Correlation between the distance of kin relations and tokens of basic native kin terms were drawn. For instance, no kin terms

for *grandparent*, *grandfather*, and *grandmother* appeared in approximately half of the signed language varieties. A similar void was also observed in collateral kin terms (E.g. *aunt*, *uncle*, and *cousin*) with fewer tokens compared to second ascending lineal terms. Only in Colombian Sign Language, one token of a first descending collateral term with no gender distinction (*niece/nephew*) was included. The data revealed that consanguineal kin terms contained a range of variation with respect to gender, age, generation, and lineality in signed languages.

With respect to the analysis of basic native kin terms, Woodward outlined sixteen generalizations of kinship terminology in signed languages, grounding a comparison with Greenberg's universals of kin terms in spoken languages. Table 6 illustrates the reference and definition for these sixteen generalizations and implications for kin terms (1978a, pp. 130-131)²⁸:

²⁸ Although Woodward did not provide implications of kinship terminology based on his proposed generalizations, I devised a condensed description of the implications using symbols for enhanced accessibility and clarity (Note: → denotes imply; = refers to existence; ≠ indicates nonexistent).

Table 6

Woodward's generalizations of kinship terminology in signed languages

Reference of Generalization	Definition of Generalization	Implications for Signed Kin Terms
Generalization 1	All signed languages have terms for lineal relatives.	Signed language = terms for lineal
Generalization 2	No signed language has a term for nonlineal relatives, unless it also has terms for lineal relatives.	Nonlineals → Lineal
Generalization 3	All signed languages have a term for offspring.	Signed language = 1 term for first descending lineal
Generalization 4	No signed language distinguishes offspring by sex or age.	First descending lineal ≠ gender or age
Generalization 5	Terms for grandparents imply terms for parents which imply terms for (or a term for) offspring.	Second ascending lineal → First ascending lineal → First descending lineal
Generalization 6	If a signed language has a basic term for father, it will also have	First ascending male lineal → First ascending female lineal

one for mother, but not
conversely.

Generalization 7	Sex distinction cannot be made for grandparents unless they also made for parents.	Second ascending lineal (gender) → First ascending lineal (gender)
Generalization 8	The existence of an ablineal (cousin) term implies at least one colineal term, but not conversely.	1 Collateral (cousin) → 1 Colineal (sibling)
Generalization 9	The existence of a term for parental (uncle/aunt) generation (or niece/nephew) implies term for sibling.	First ascending collateral (or first descending collateral) → Siblings
Generalization 10	Sex distinction does not occur for ablineals (cousins) or for offspring generation colineals (niece/nephew).	Collateral (cousin); first descending collaterals ≠ Gender
Generalization 11	If sex is distinguished for parental generation colineals (uncle/aunt), there will be a sex distinction for siblings.	First ascending collaterals (gender) → Siblings (gender)

Generalization 12	All signed languages (except Indian) distinguish sex of parents.	Signed language → first ascending lineal (gender)
Generalization 13	All signed languages (ex. Modern French) have at least one term for nonlineals.	Signed language → 1 nonlinear term
Generalization 14	No signed language (ex. Egyptian) has a term that can refer to both lineal and nonlinear relatives.	Signed language ≠ 1 term for [lineal + nonlinear]
Generalization 15	No signed language (ex. Colombian) has a term for offspring generation colineals (niece/nephew).	Signed language ≠ 1 term for first descending collateral
Generalization 16	No signed language (ex. Danish) has terms for great grandfather and great grandmother.	Signed language ≠ terms for third ascending lineal

Note: Woodward uses the term of *ablineal* to refer to non-lineal, collateral kin members. The use of the term of *colineal* bases on the horizontal generation between the reference point and kin members (E.g. *colineal* relationships may refer to *Ego: siblings; parental: aunt/uncle; offspring: niece/nephew*). While Woodward employs the term *sex*, the function of *sex* is similar to the term of *gender*.

Woodward's study found thirteen out of sixteen generalizations defined for signed languages to hold mostly true for spoken languages (Generalizations 1, 2, 3, 5, 7, 8, 9, 10,

11). Generalizations 1 and 2 corresponded to what Greenberg described about relative markedness in kinship terminology. Nonlineal terms are marked while lineal terms are unmarked in signed languages, paralleling Greenberg's discovery. A specific hierarchy of kinship terminology illustrated that lineal (unmarked) vs. collateral (marked), consanguineal (unmarked) vs. affinal (marked) are very common in attested languages (Greenberg, 1966). Nyst (2007) found one collateral kin term, *younger sibling*, in Adamorobe Sign Language where the term is specified by age compared to unspecified lineal kin, suggesting that *younger sibling* is more unmarked than other kin terms seen in Adamorobe Sign Language. Nyst viewed this finding as a counter-claim to what Greenberg posited about collateral terms being more marked than lineal terms along with the seniority in sibling terms where older sibling terms are unmarked as against marked terms for younger siblings.

However, three other generalizations (4, 6, and 12) regarding parental terms countered what Greenberg defined. Woodward partly refuted Greenberg's universal: "for the first ascending as against the first descending generation it is fairly common to find systems in which the marked character of the latter is evidenced by neutralization for sex reference, whereas, as has been seen, the distinction of father and mother is universal" (Greenberg, 1966, p. 76). Woodward considered this claim unfounded as no distinction of gender and age were apparent in offspring terms, proposing that Greenberg's universal should be redefined without referring to the set of offspring terms with respect to parental terms.

Generalization 12 described that gender is differentiated in parental terms in all kinship terminologies. However, Woodward found that the semantic concept of *father* and *mother* is expressed with only one term in Indian Sign Language, illustrating no gender distinction differentiates between male and female parent. This finding countered Greenberg's claim that all language systems discriminate the gender of parents with two separate terms (1966). Woodward proposed a universal to be stated as "if sex distinctions are made in a kinship system, then sex distinctions must be made for parents" (1978a, p. 132). Woodward argued this would include Indian Sign Language as it does not discriminate in gender in all kin terms and thus operate as a universal. This revised universal contradicts Greenberg's claim that "all systems make some use of generation, consanguineal vs. affinal distinctions, and sex of relative" (Greenberg, 1966, p. 81). Woodward suggested a modification to this universal by excluding 'sex of relative' to present a gender-independent universal description of kinship terminology in all languages, including spoken and signed languages.

Regarding to Greenberg's claim about parental terms being differentiated based on gender, Woodward found no basic kin term for *father* and *mother* in Formal Australian, British, and Modern Scottish Sign Languages, because these kin terms were realized with an initialized form (E.g. 'M' for *mother* and 'F' for *father*). As for Informal Australian and Old Catholic Scottish Sign Languages, they contained a basic kin term for *mother* but not for *father*. Therefore, Woodward argued that if a language contains a kin term for *father*, then it is implied that the language also has the term for *mother*—describing Generalization 6. Woodward argued that not all languages have basic kin

terms for *mother* and *father*, refuting Greenberg's universal of gender distinction in parental terms.

Due to the study's restrictive methodology, Woodward's conclusions may have presented misleading arguments and conclusions concerning the distribution of kinship terminologies, resulting in few counter-claims to the universals defined by Greenberg. As much as Woodward attempted to design this study to represent signed language typology well so to compare it with the universals postulated by Greenberg, his typological analysis departed from methodological and theoretical frameworks of language typology and other analyses of kinship terminologies.

Summary

Many signed languages remain yet to be documented and have their histories described. This challenge has been illustrated by recent studies of lexical similarity in signed languages that speculates that to determine the potential comparative relationship of one signed language requires contact by other signed languages. Rather than speculate about possible genetic relationships of signed languages based on geography and spoken/written languages, an analysis of the history, although relevant, will be considered outside the scope of this investigation to be addressed by future research of historical experts.

Motivation of sign construction is largely rooted in iconicity; presenting the opportunity to examine the interface of phonological and morphological components of signs on a referential continuum of iconic and arbitrary properties. A discussion reviews the challenges in discriminating formal properties of morphology and phonology in

signed languages, demonstrating how formational properties carry more semantic weight—largely due to iconicity, metaphoric and metonymic schemas in signed languages than seen in spoken languages. A review of previous studies illustrates how kinship terminology has been analyzed including a detailed discussion of Woodward’s comparison of kinship terminology in signed languages to Greenberg’s universals of kinship terminology in spoken languages. These studies revealed how kinship terminologies have been used to categorize signed language using methodology similar to spoken languages except for few differences that appear not to fit the principles of markedness theory and universals presented by Greenberg.

Conclusion

Chapter Two discussed the theoretical framework of spoken language typology, incorporating the limited literature of signed language typological studies. Relevant works addressing iconicity, phonology and morphology in signed languages illustrated theoretical and methodological challenges in signed language research. Chapter Three addresses the methodology of this study with a description of the research design, sources of data collection, and procedures used to conduct the study.

CHAPTER 3: METHODOLOGY

The research design for this study borrows its methods from typological studies of spoken languages. This chapter outlines the research design, limitations of research design and data sources, procedures of the study, and coding criteria used to analyze kinship terminology of signed languages, as well as establish the validity and reliability of the study. These methods provide the foundation for the data analysis of kinship terminologies of signed languages discussed in Chapter Four.

Research Design

This study examines typological patterns of kinship terminology in signed languages. Data collected from a convenience sample of forty signed languages dictionaries representing approximately three signed languages from each geographic macro-region (see Appendix C Table C1).

To undertake standard typological research, Croft (2003) outlines three strategies:

- 1) Determine the particular semantic (-pragmatic) structure or situation type that one is interested in studying.
- 2) Examine the morphosyntactic construction(s) or strategies used to encode that situation type.
- 3) Search for dependencies between construction(s) used for that situation and other linguistic factors: other structural features, other external functions expressed by the construction in question, or both. (p. 14)

Adhering to Croft's typological research strategies as guidelines for this study:

- 1) The category of kinship terminology was examined in dictionaries to establish a consistent semantic domain across signed languages.
- 2) Constructions of kinship terminology signs' phonological features were analyzed (in lieu of morphosyntactic features of spoken languages, per discussion of the problematic issues regarding distinguishing phonology and morphology in signed languages in Chapter 2)

The relationship between phonological structure and semantic domain were examined to determine if any dependencies existed between linguistic form and function. Conducting typological analyses requires logically independent feature dimensions correspond to semantic components, and these relationships may emerge as linguistic patterns (Greenberg, 1966, 1990). Greenberg (1990) described a typological analysis as consisting of dimensions assigned with values based on a matrix of logically possible combinations. Languages defined by the combinations of values they possess can then be typologically classified. Modeling Greenberg's approach to typological analyses, this study investigates the way in which the encoding of kinship terminology in signed languages provides evidence of linguistic patterns that can serve as a potential key to understanding signed language typology classification.

Appropriateness of Design

According to the practice of language typology in the field of linguistics, spoken languages are systematically compared and classified into a variety of structural types. Although the design of this study is based on spoken language typological studies, few studies of signed languages examine form-function mappings of signed forms to extract

patterns. Studies of signed language varieties have been primarily concerned with lexical similarity (Aldersson & McEntee-Atalianis, 2008; McKee & Kennedy, 2000; Parkhurst & Parkhurst, 2003; Sasaki, 2007; Woodward, 1993a, 1993b, 1996, 2000). These studies compare the lexicons of two or more signed languages by examining formational properties of similar lexicon to determine the degree of lexical similarity, serving to seek potential genetic relationship and iconic motivation among signed languages. Their analyses focus on formational properties of signed forms, coding phonological parameters of handshape, location, movement, and for some, palm orientation. Cross-linguistic analyses of signed languages illustrate the degree of similarity in lexicon based on phonological structures. As a result, this research design parallels other studies in terms of examining the formational properties that investigate form-function mappings of kinship terminology. This study of kinship terminology seeks to determine what values and combinations of structural types encoded in signed languages can be used to define a typological classification of the signed languages.

Signed Language Dictionaries as Data Sources

Conducting a typological analysis of signed languages requires access to large corpora of data; however, in reality, most living signed languages have not yet been documented, described or analyzed. Some signed languages are documented and accessible as either dictionaries or media-based language learning materials. In order to build a data corpus of kinship terminology in signed languages, dictionaries provided the best reference opportunity for conducting a large cross-linguistic study. Since reference grammars of signed languages are not available, sources of signed language terminology

are primarily limited to dictionaries. Even so, acquiring an international set of signed language dictionaries required an exhaustive search of libraries, bookstores, and personal contacts. Sources consist of signed language dictionaries in a variety of formats including books, CDs, DVDs, and the Internet. The signed language dictionaries collected for this study were published from 1979 to 2008, with the older dictionaries primarily in book form and more recent publications in video clips accessible by CDs, DVDs, or the Internet. Accessibility to signed language dictionaries became the constraint determining which signed languages could be examined in this study. The format of dictionaries further influenced how signs under study could be perceived, and their subsequent categorization, and illustrations were characteristically intended to provide readers a tool for learning each signed language. The structure of signed language dictionaries typically serves people who are competent in their native written language, but not to function as an equally balanced bi-lingual dictionary. Whereas in a bilingual dictionary of two spoken languages, one may look up a lexical entry in either language to find the meaning of an unfamiliar word. Spoken bilingual dictionaries divide into two sections; each section devoted to one language's lexical entries and their translation. Spoken bilingual dictionaries function as an organized system, providing information about lexical entries' meanings, grammatical functions, synonyms and/or antonyms. In some cases, examples of phrases containing the lexical entry are given, illustrating the use of the lexical entry in the language.

Unlike spoken bilingual dictionaries, signed language dictionaries typically do not contain two sections enabling search for a lexical entry in either language. Instead, signed

language dictionaries are organized according to the alphabetic ordering of forms of the native written language.²⁹ One has to search for lexical entries by spoken translated gloss to find the corresponding lexical entry of a sign. Correlated with its written form, the signed form is depicted by a photo or a video clip. Some, but not all signed lexical entries include formational descriptions of phonological parameters (E.g. handshape, location, movement, and palm orientation). The authenticity of the signed form depends on the clarity of the illustration's depiction of phonological descriptions, which is another limitation requiring verification in some cases by language consultants proficient in the signed languages under study.

Signed entries are often not defined in a consistent manner according to meaning, function within the signed language, and the context of how the sign is used in discourse. Each dictionary assumes its readers are familiar with its written language which must be used to decode the meaning and function of the sign. People familiar with signed languages recognize that a written translation equivalent does not always accurately reflect the actual meaning or use of a sign in signed discourse. The gloss of a sign is *de*

²⁹ A few dictionaries adopt a different strategy to categorize signed lexical entries based on phonological parameters of the signed form. The recent development of on-line dictionaries often categorizes signed forms according to handshape and location and written translation equivalents, (E.g. The American Sign Language Handshape Dictionary, 1998 (book format), The Dictionary of Danish Sign Language, 2008 (on-line format)). Dictionaries that are at least in part organized by handshape ordering include the British Sign Language (Brien, 1992), and the Italian Sign Language (Radutzky & Torossi, 1992).

facto a word-label to specify a sign as the gloss does not permit recoverability of the signed form. In this study, glosses will be preserved to ensure the ability to identify signs in dictionaries rather than rely on translated meanings—for the purpose of identification to replicate the study using same dictionary sources. Therefore, written translation equivalence itself poses an overarching limitation of this study, as semantics encoded in the signed form must be translated, then assumed. This limitation is discussed again in context of the conventionalized transcription of signed languages.

A sign in the dictionary functions as an idealized representation of the sign's formation. Signed language dictionaries may not include all signs, either lexical or phonological variants, known in their languages.³⁰ In contrast, dictionaries may contain lexical entries that may not be actually used by signers of their language communities, but rather represent an obligation to translate written/spoken lexicon into signed forms. Follow-up interviews with language consultants provided insights on how kin relations are actually conveyed in their respective signed language discourse.³¹

³⁰ Signed language dictionaries typically do not contain signed forms of highly iconic structures produced by complex signed constructions composed of complex signified elements. However, the frequency of these highly iconic structures is extremely high in signed discourse; yet signed dictionaries exclude these constructions by taking the position that these constructions are “non-standardized” or “productive” lexicon (Pizzuto *et al.*, 2006).

³¹ Woodward described the two linguistic communities of Providence Island Sign Language in the Caribbean and Adamorobe Sign Language as not typically expressing kin terms in signed discourse, but instead refer to kin members and other people by their signed names. This unique phenomenon reflects

The variety of the quality of photos or drawings in the signed language dictionaries used in this study range from high to poor in terms of the clarity of the illustrations. This continuum of illustration quality poses challenges in determining how a sign is formed, especially where a phonological description was not given. The quality of decoding phonological parameters was more restricted in the book format, constraining deciphering phonological structure when the quality of the illustration in a photo or a drawing was poor—especially with respect to movement and palm orientation. In contrast, good quality video clips clearly convey how phonological parameters are realized in a sign. The quality of signed illustrations in any format varied among signed language dictionaries and must be recognized as a constraint of this study.

Dictionaries designed for economy of publication typically present as many lexical entries as possible in as little space as possible. Because of this need for economy, dictionary entries are rarely shown as two separate illustrations of one sign needed to depict the specifics of the implementation and execution of that sign (as opposed into formal linguistic publications which may have a greater need to illustrate details of a sign). Finally, one of the primary functions of signed language dictionaries is to provide documentation representing the language to respective national governments in order to retain official recognition of local signed languages and obtain funding for signed

feasibility due to small populations and close proximity in their community habitation, where everyone knew everyone and already had the knowledge about the types of relationships they had (1978a, p.137).

language research, social services, and support for the education of the deaf.³² Although dictionaries constrain the type and amount of information of signed lexical entries, they serve as a reasonable and available source of signed language data for this typological study.

Conventionalized Transcription of Signed Languages

Signed forms are conventionally transcribed in glosses which merit discussion. Generally speaking, signed languages have not yet adopted conventionalized writing systems similar to many spoken languages for several reasons. Signed languages behave as oral/visual traditions, passing language from older to younger signers. The modality of signed language itself poses challenges of translating a four-dimensional package into the flat surface of two-dimensional encodings. Signed languages mark grammar on the face and exploit space to convey meaningful information.³³ These factors contribute to the tendency of not conventionalizing written representations of signed languages to document and preserve these languages. However, in recent times, sophisticated technology transforms the ability to document all the dimensions of signed languages using economical but superior quality video as compared to drawings or static photographic images.

³² In the foreword of many signed language dictionaries, it is often mentioned that the purpose of the publication of their signed language dictionary is to obtain recognition and funding from the national government in order to support and improve the quality of the deaf (Afghan, Mongolian, etc).

³³ Wilcox proposed that non-manual signals experience grammaticalization on the basis of studies of established signed languages describe grammar encoded on the face (unpublished).

References to specific forms and grammar of signed languages are conventionally glossed in written representations of the correlating spoken language. This assumes and requires the reader be familiar with the written language to figure out the meaning of the gloss. Another drawback is that glosses do not enable the recovery of forms of signs comparable to spoken languages and their written representations (Pizzuto *et al.*, 2006, Di Renzo *et al.*, 2006).³⁴ A glossed transcription of signs loses transparency of its form, meaning, and function, which creates a limitation of the study due to the potential ambiguity in determining the kin relation based on forms of translations. For example, there are three lexical varieties of PAPA ‘father’ in Argentinean Sign Language. The gloss cannot explicitly refer to a specific lexical form due to differences in handshape and location of these three lexical varieties; therefore, the ability to recover specific forms is severely impeded by gloss transcription. In turn, the function of gloss transcription is a merely representative label to specify a sign and/or signs of similar semantic encodings. Furthermore, the written glosses exemplify more on written translation’s semantic properties and functions rather than what is encoded in the sign itself and its function in the signed language. To minimize dependency on glossed representations, the analysis of this study uses the encoding of phonological structure of signed terms as its basis.

In signed language literature, the conventional way to transcribe signs is organized by capitalized glosses of alphabetic letters. All dictionaries of signed languages

³⁴ To retain transparency of signed forms, SignWriting, as pictorial-glyph transcription, permits readers to recover the form (Sutton, www.signwriting.org).

adopt a gloss system using their official written language; however some also include English glosses. Dictionaries used in this study that contain English glosses are: Afghan, Australian, British, Chinese, Hong Kong, Indo-Pakistan-Bangalore, Indo-Pakistan-Karachi, Irish, Israeli, Ho Chi Minh City, Italian, Kenyan, Korean, Mexican, Mongolian, Namibian, Nepali, New Zealand, Persian, Russian, Tanzanian, Tibetan, Turkish and Ugandan Sign Languages. Although these dictionaries are glossed in English, some of them are also glossed in their official spoken languages (E.g. Afghan, Chinese, Hong Kong, IPSL-Bangalore, IPSL-Karachi, Israeli, Italian, Korean, Mexican, Mongolian, Namibian, Nepali, Persian, Russian, Tanzanian, Tibetan, Thai, Turkish). Dictionaries glossed in written languages other than English (i.e.: Croatian, Dutch, and Spanish), were translated into English for this study using written dictionaries. Signed dictionaries that required the researcher to translate into English without the benefit of written dictionaries include: Argentinean, Brazilian, Bulgarian, Croatian, Danish, Dutch, Finnish, French, German, Japanese, Norwegian, Panamanian, Quebec, Swedish, Thai. For those written languages for which an English translation dictionary was not available, speakers of the written languages translated the kinship terminology of their signed language dictionaries (i.e.: Bulgarian and Japanese) into English.³⁵

³⁵ I deeply thank Richard Cokart, Juan Druetta, Thierry Haesanne, Sung-Eun Hong, Simone Kollien, Deniz Ilkbasaran, Berna Marthinussen, Susan Metheny, Ana Medina Murillo, Janne Boye Niemelä, Peter Niemelä, Dan Parvaz, Justin Powers, Evgenia Prozorova, Ido Roll, Paolo Rossini, Logan Sutton, Agnes Villwock, and Yumi Watanabe for their time to help with translations.

In this dissertation, lexical entries were clarified by using English translation equivalents expressed in italics to maintain easier readability (E.g. *father's brother's wife*). The purpose of employing English translation equivalents was to maintain consistency in conveying conceptualized representations of kin terms across multiple signed languages. Few incidences of gloss entries include non-English translations along with English translation within singular quotes to inform the reader of potential linguistic influences of written forms on signed forms (E.g. Tanzanian, BINAMU 'cousin'. The signed form overlaps with the handshape of 'B'; driven by the orthographic representation of the first letter in the written form). Although a gloss transcription cannot express the full transparency of the phonological shape of a sign's meaning and function, glosses used this study as reference to each sign to aid examination of the relationship between the phonological structure and the semantic domain of signed kinship terminology.

The challenges of using signed language dictionaries mainly center on inconsistent methods of glossing as a primary representation tool and the quality of sign images. In most cases, meaning must be discerned from the gloss and coded phonological parameters of a static image of a sign. Despite the constraints dictionaries impose on analyzing signed languages, dictionaries provide researchers invaluable access to a large sampling of signed languages enabling cross-linguistic study of signed language typology.

Population

The population of this study is the signed languages of the world as represented by signed language dictionaries. Signed language dictionaries reflect languages used by signing communities.

Informed Consent

All data was collected from published sources. Human subjects were not used as data sources, except as expert language consultants when needed for validation to clarify signed language reference materials.

Language Sampling

The convenience sample of forty signed language dictionaries of geographically dispersed regions in the world examined in the study represent the available signed language documentation representing the signing communities. To explore the language typology of these signed languages, the data corpora required a large sampling of geographically and genetically unrelated signed languages. Ideally, to conduct a language typological study, one would analyze a randomized language sampling balanced on distinctions of geography and genetics. However as Zeshan (2008) has also noted, to devise a truly representative and balanced language sampling of signed languages is currently impossible at the time of this writing. Most signed languages have not yet been fully described and codified. Many have not been documented in preserved formats at all. This makes it difficult to identify which signed languages belong in particular language families. Identifying genetically unrelated signed languages is even more problematic. Sources other than American and European signed languages lack formal historical and

linguistic accounts of many signed languages. Much of the knowledge of signed languages remains undiscovered.

Typological analyses should be based on the preferred sampling of genetically unrelated languages where it is possible to adequately determine. Although there are few documents describing the history of signed languages, those that do exist mostly refer to European signed languages and their historical influences on other signed languages (E.g. African and Asian signed languages experienced language influences from Scandinavian signed languages (Woll *et al.*, 2001); the presence of Irish Catholic schools for the deaf influenced signed languages of Australia and South Africa to incorporate Irish lexicon (Johnston & Schembri, 2007). Other genetic relationships among signed languages remain unknown. The scarcity of descriptions of historical migratory relationships of signed languages poses a problematic dilemma for conducting typological analyses of signed languages. One strategy to mitigate these effects to the extent possible is to randomly choose signed languages from distinct geographical areas.

The large sampling of signed languages selected for this study was chosen from a variety of macro-geographic regions. A macro-geographic region reflects geo-political boundaries, and each region has at least one signed language represented. Language sampling was restricted to two criteria. The first criteria concerned the accessibility of signed language dictionaries. To ensure broader representation, the second criteria strived to sample at least three signed languages from each specific macro-geographic region of the world. Except for Central America, Southeast Asia and the Middle East, there are at least three signed languages represented in each macro-geographic region (Africa, North

America, South America, Central Asia, Far East Asia, and Europe). Although these two criteria may not guarantee a balanced language sampling, they did at least provide a relatively large sampling from geographically dispersed regions useful for investigating the typological patterns and genetic relationships of signed languages.

Data Collection

This section addresses data collection procedures. Details of phonological structures and semantic properties of signed kinship terminology was coded and stored in three separate databases: phonological coding, semantic coding and kin relation within the kinship system. For each database, coding criteria was defined by specific variables based on phonological parameters, semantic derivation of lineal terms from person terms, and encoding kin term based on kinship system (Appendix E, Table E1, Table E2, Table E3).

Procedure for Conducting the Study

Each signed language dictionary studied includes a set of kinship terminology; providing the total data corpora for forty signed languages. The identification of a kin term initiates a series of coding and input procedures describing the term into a database management system. The custom-made database allowed for encoding detailed descriptions of the formational properties of signed kin terms (Appendix E, Table E1: “Schema for phonological coding of a kin term”). The output of the data coding included various sorted and filtered reports defined to reveal specific patterns of the phonological structure of signed language individually and cross-linguistically.

Signed forms must be translated and coded in a consistent manner in preparation for data analysis. The extraction of kin terms from signed language dictionaries includes several steps. First, one has to observe the organization of the signed lexicon in each dictionary. Nearly all signed language dictionaries adopt the organization based on written translation equivalents of signed lexical entries. A list of kin terms must be compiled into a language the researcher is familiar with (E.g. English), as some dictionaries require translation from one written language to another (E.g. Spanish to English). Once a list of translated kin terms in English is developed and gathered, the search for signed kin terms begins.

The structure of a signed language dictionary typically categorizes lexical entries based on one of two strategies. The first, more common strategy observed in signed language dictionaries, orders signs by the orthographic representation of translation equivalences of their written language (E.g. alphabet; character). The second strategy uses the centralization of themes (E.g. kinship; food; religion; etc) to structure the dictionary.³⁶ A few dictionaries cluster all kinship terms along with person terms and pronouns and/or occupations (E.g. Afghan, Mongolian). After determining the organization of the dictionary, the set of kin terms is identified and extracted for data entry. The set of kin terms may be either indexed in the appendix and/or require manually leafing through the entire dictionary to identify and include all kin terms. A word of

³⁶ Video-based dictionaries appear more thematic-oriented by having more systematic options for the user to decide which search strategy best fit the user's need.

caution, appendices were not always complete or accurate. In some cases kin terms appeared in the dictionary, but not in the appendix. Searching through the dictionary page by page was also employed to inspect for possibly overlooked, misspelled or mistranslated kin terms.³⁷ Incorrect translations were either verified according to spoken bilingual dictionaries and/or fluent bilingual speakers.

The second step involved data entry of all kin terms identified in the signed language dictionary. The database functioned as a mechanism to identify and code phonological forms of signed kin terms. Kin terms were coded and stored in the software of FileMaker Pro 9, a database management system. The software enabled the ability to record and manage detailed information such as phonological coding and semantic relations with respect to each kin term. Also, the database enabled the storage of images of signed terms, ensuring preservation of signs at hand rather than requiring constantly referring back to different signed language dictionaries.

Databases for Storing and Coding Kinship Terminology

Data was managed in three separate databases. The first database encoded the phonological structure of each kin term. The second database documented the phonological relationship between parental terms and person terms to track whether

³⁷ Mistranslated glosses may occur when a mistranslated and/or mislabeled “gloss” is enlisted in the appendix even while there is an entry of a kin term within the dictionary (E.g. In Afghan Sign Language dictionary, there was a mislabeled/mistranslated entry ‘limbs’ for ‘in-laws’. Along with English translations, the lexical entries were also identified by numeral representations in the appendix. A proficient Dari-English speaker caught this mistranslated word-label [“gloss”].)

parental terms were motivated by person terms. The third database included kinship analysis of the term. The coding enabled differentiation of the formational properties of a kin term in detail. Examining the phonological shape of each kin term provided insight into how kinship terminology is constructed in individual signed languages. All three databases maintained detailed information about kinship terminology of forty signed languages (Appendix E, Table E1, Table E2, Table E3).

Database for Phonological Coding of Kinship Terminology

The first database stored phonological coding of kin terms collected in signed languages studied. The database provided access to sort and filter the data in various ways in search of any patterns encoded in formational properties of signed kin terms. The form of a kin term conveys structural coding, including both simultaneous and sequential encodings; therefore, the ordering of components of the kin term description had to be explicit in the database. Each kin term was encoded based on twenty-four variables defined in Appendix E Table E1. Also, in order to preserve illustrations of signed kin terms, photos or video clips of kin terms were scanned or downloaded from the CD or DVD and attached to the kin term record in the database. After downloads and scans were completed, images of all kin terms were transferred into the database.

The phonological database includes classifications of the formational properties of each kin term. To encode formational properties, each phonological parameter (handshape, location, movement) was coded according to a legend of assigned variables.

Variables and Coding Criteria: Phonological Coding of Kinship Terminology

Prior to Stokoe's 1960 groundbreaking analysis of the internal structure of American signed forms, signs were considered to be simply holistic where signs were not analyzed into smaller lexical units. Stokoe argued that three major components of handshape, location, and movement form signs. While the human hands shapes signs using its inherent physical capabilities in different possible contours (selected fingers and digital joints) qualified can be systematically organized by a codified set of types of handshape, location, and movement. These major phonological components in turn are described to create an inventory of finite gestural components specified by signed language to mirror to the spoken language phonology that Stokoe argued for in 1960.

While handshape, location, and movement are widely accepted as signified elements in signed language phonology, other aspects of sign formation, whether or not they are phonologically contrastive, continue to be debated (Johnston & Schembri, 2007). The aspects that may potentially convey contrastive features involve palm orientation and non-manual signals. Battison found palm orientation to function as a contrastive feature in signs where the orientation of the palm is directed in the space (Battison, 1978). In contrast, Brentari (1998) argued that palm orientation is not a major phonological component, but is instead a redundant feature inherent in sign formation that does not contribute additional information. Many analyses of signed languages (E.g. lexical similarity) do include palm orientation as one of four fundamental phonological features; reflecting the view that palm orientation is integral in sign formation (Johnston & Schembri, 2007; Sasaki, 2007).

Description of signs typically focuses on manual formation rather than its non-manual aspects. Non-manual signals (or non-manual markers) realize signified elements of gestural movements encoded on the face, eyes, mouth, and the body. As non-manual signals are constantly employed during signed discourse, non-manual signals appear to have a wide range of functions; including grammatical functions including: negation, adverbial and adjectival modification, etc. Non-manual signals are rarely used alone as a signed form, nor are non-manual signals produced in an obligatory manner with all manual signs with a few exceptions (Johnston & Schembri, 2007). Non-manual signals are not found to be phonologically contrastive similar to manual phonological components, illustrating that non-manual signals are not considered an essential component contributing to the foundation of sign formation, but instead signify grammatical and emotive purposes in signed discourse.

A signed form simultaneously bundles phonological components within a sequence, signifying a transitional change in location and movement (Liddell & Johnson, 1989). The sequence of a form was coded according to the initial and final positions. For this study, the formational properties of signs' handshape, location, and movement were explored to determine motivation of linguistic structure. The three phonological components of a sign are described as follows:

Handshape

Handshape codifies the configuration of the hand and selection of fingers. Adopting Brentari's (1990, 1998) phonological description, the configuration of the handshape is identified and categorized to determine phonological structure:

- 15) The count of hands: Refers to either one or two manual-signs
- 16) Dominance of hands: Refers to which hand is dominant or non-dominant to minimize the potential hazards posed in confusing with signer's preferred hand dominance (right-handed versus left-handed). Identifying the hand dominance maintains a consistent platform to compare with other signed constructions; avoiding potential confusion posed in dictionaries consisted of more than one signing model. Signers choose their hand dominance as either right-handed or left-handed; therefore, it is more consistent to code either dominant and/or non-dominant hand, avoiding potential confusion with right and left hands.
- 17) Selected fingers: Identifies which fingers are selected: thumb, index, middle, ring, and pinky
- 18) Shape of finger joint: Categorizes according to the configuration of the selected fingers by the definition of straight, bent, and closed
- 19) Shape of the hand: Categorizes according to the configuration of the hand by the definition of open, flat, spread, stacked, closed, and fist
- 20) Initialized handshape: Conveys an orthographic representation of a letter or character

In some cases, kinship terminology uses initialized handshapes realized through a visually codified alphabet or characters influenced by written languages. For example the American sign, *aunt*, is expressed with a handshape of 'A' overlapped to a form situated

on the jaw area that refers to female kin members. According to works in signed language phonology initialized handshapes mark signs; an important factor to consider when analyzing phonological structures in signed languages' kin terms (Brentari, 1990, 1998).

Location

Location (aka. place of articulation) refers to where signs are situated in space: near the forehead, eye, ear, nose, face, chin, chest, or a neutral position situated in front of the signer. For instance, if a sign is located in the forehead space, then it is produced either on the forehead or in the area near the forehead. A sign situated in the space in front of the signer is labeled as neutral space.

Within the coding procedure, location was identified and categorized according to:

- 21) Location: Where the sign is situated in space
- 22) Contact of the sign: Does the sign contact at the given location or not
- 23) Lateral orientation: Where is the sign situated with respect to the lateralization of the signer: ipsilateral, contralateral, and center
- 24) Sequential position of the sign: Identifies either initial or final position of the sign realized
- 25) The directionality of the sign's proximity to neutral space: near the signer or away from the signer (signifying the relationship between location and movement)

Movement

A sign may contain movement. Movement is coded to reflect how it is produced with respect to location, manner, and internal movement. One type of movement depicts a starting and an end point on a path. Manner illustrates how the movement's path is realized in three major categories: stative (no explicit path), straight path, and circular path. Another type of movement concerns internal movement of the fingers and/or wrist co-occurring on the path of the movement, such as fingers wriggling or wrist flicking, etc. These movements, coded separately, clarify path movement. Some signs contain only path movement or only internal movement, but both movements may be produced simultaneously. The movement of signs codifies into three major categories: stative, straight line, or circular, with two subcategories of points of location and internal movement. Movement is coded according to:

- 26) Shape of movement: stative, straight, arc, circular (a full circle opposed to an arc which is viewed as an half circle)
- 27) Internal movement of selected fingers and wrist: (finger wriggle, finger open, finger close, finger open-close, tap, trilled, wrist flick, wrist twist)
- 28) Count of movement: (one, two, three)

The internal structure of a sign is demonstrated by four phonological parameters: handshape, location, movement, and palm orientation, and these simultaneously articulated bundles are organized within a sequence of initial and final positions. Palm orientation indicates where the palm is orientated in signing space. Although palm

orientation was coded for the study, palm orientation and non-manual signals were not analyzed for this study to minimize potential speculation. Static photos of signs do not clearly convey the orientation of the palm, especially when they are realized sequentially. Whether non-manual signals (i.e.: mouthing) are defined as a phonological parameter is controversial, as non-manual signals are not necessarily consistently expressed in a specific manner when a sign is realized, except for a few signs such as the American form PAH ‘finally’ with abrupt opening with lips (Valli & Lucas, 1992). Mouthing also serves an adverbial function to construe the mood of a verbal event, which is accounted for in some signed languages (Liddell, 2003). Recent studies describe how mouthing is integral to European signed languages (Boyes Braem & Sutton-Spence, 2001).

Coded phonological features were examined for typological markedness of the semantic domain of kinship terms to determine if and how linguistic patterns emerged among the signed languages studied.

Count of Kin Terms: Complexity of Lexical Units

A dictionary entry of a kin term may be realized by one holistic form or more than one form, and this poses a challenge in determining if these forms contain more than one lexical units and/or morphemic units. Kin terms in this study were categorized by how many units were observed in their lexical structures. The measurement of lexical units was determined by how the lexical entry was shown in the dictionary. For instance if there was one lexical unit for a kin term, then one photo, drawing, or video clip showed a holistic phonological form to represent it. To convey a kin term as a lexical unit with more than one morphemic unit, an English gloss was written with a hyphen between the

two glosses, E.g. ELDER-BROTHER for Japanese Sign Language's ANI 'elder brother'.³⁸ When two or more lexical units express a kin term, they were illustrated with two or more photos and/or drawings of the kin term. Some kin terms experience a compounding process, illustrated through a construction with a form of '+' in between the English glosses. For example, a compounded construction of French Sign Language *grandmother* is represented by [*woman* + *old*]. To convey a kin term with two or more lexical units, a constructed representation shows brackets around each word to mark distinct signed forms, E.g. Three signs of [*woman*] [*affinal*] [*same*] denote *sister-in-law* in Afghan Sign Language. Each kin term was encoded with one, two, three, or four lexical units, and examined to determine patterns of construction (Appendix G).

Within one photo or drawing, some lexical entries may display a series of sign illustrations with numeral indications marking the order of each sign. This process may indicate several possibilities. The first possibility reflects two or more separate lexical units. The second possibility represents a combination of two or more lexical and/or morphemic units, suggesting the given sign experiences a process of compounding. Other possible processes of lexicalization may be incorporation, fusion, or nominal modification (Johnston & Schembri, 2007). Numeral incorporation in established signed language are expressed where the handshape encodes a numeral value in to a stem sign and retain all other phonological properties (E.g. American Sign Language: THREE-

³⁸ Glosses representing signed forms are conventionally capitalized in publications on signed languages. The italicized version of a word denotes its equivalent translation in English.

DAY ‘three days’) (Johnston & Schembri, 2007; Liddell, 1996). Fusion takes place when two signs each contribute partial structural coding to a newly combined sign. Zeshan illustrates fusion in Indo-Pakistan Sign Language with: SA: TH+JA:NA ‘together-go’. The fused sign depicts a merge of the handshape of a stative form of SA:TH ‘together’ and the directional movement and location of JA:NA ‘go’ (Zeshan, 2000, p. 79).³⁹ However, fusion seems to be an infrequent morphological process in signed language (Zeshan, 2000). Nominal modification results from a process where the nominal sign experiences modification. One type of nominal modification encodes plurality through reduplication of movement (Johnston & Schembri, 2007). The fourth possibility includes other linguistic processes that may not yet have been identified in signed languages. In cases where lexical entries show numeral ordering in a drawing and/or photo, determining if these components contain two or more lexical and/or morphemic units required an analysis within the individual signed language. For example, consider the Pakistani sign for *sister*. The lexical entry is first expressed by pointing at the nose, then

39 Although Zeshan argues the form SA:TH+JA:NA ‘together-go’ experiences fusion, the form appears to be potentially analyzable from elements of these two signs of SA:TH and JA:NA. Hopper and Traugott describe fusion as “a stage in which the phonological substance of an affix (or of the subordinate part of a compound) and the stem start to become indistinguishable from one another” (2003, p. 158). Although the process of fusion may be gradient depending on the erosion of phonological residue in original forms, the construction of a fusion cannot be analyzed into smaller discrete morphemes but instead has to be re-analyzed as a special form in the language (Croft 2003, p. 39). In turn, it is possible that the form SA:TH+JA:NA ‘together-go’ is experiencing a gradual process of fusion.

secondly, the pointing changes to a two-handed form of index fingers, situated in neutral space where both hands moves horizontally from contralateral to center in a linear manner. Based on the analysis of Pakistani kinship lexicon, the pointing at the nose appears to function as a gender marking, indicating feminine. The example of Indo-Pakistan sign *sister* is combined of two signs, AURAT ‘woman’ and SIBLING ‘sibling,’ suggesting the form *sister* has experienced lexicalization (Zeshan, 2000). Zeshan argues that the lexicalization process for *sister* is compositional not compounding, because the form *woman* along with other lexical forms paradigmatically constructs many Indo-Pakistan Sign Language female kin terms (Zeshan, 2000). Within the scope of kinship lexicon, if patterns emerge to identify specific phonological structures with specific semantic domains, then corresponding coding determination for these lexical entries consist of ordinal numbering for one, two, or more than two lexical units.

Data collection included the kinship terminology of forty signed languages, in search of typological patterns. To discover them, kinship terminology was identified and coded to derive and record semantic properties in relation to phonological properties.

Database for Semantic Derivation of Lineal Kin Terms from Person Terms

The second database captured the encoding of parental, grandparental, and offspring terms semantically derived from person terms (Appendix E Table E2). For each signed language, the database was used to store identified lineal kin terms of *father*, *mother*, *grandfather*, *grandmother*, *son*, and *daughter* to enable the determination of whether or not they were derived from person terms of *man*, *woman*, *boy*, and *girl*.

Each pair of parental terms of *father* and *man* and *mother* and *woman*, were compared on phonological parameters of handshape, location, and movement as described in Appendix E Table E2. If the parental form illustrated the same phonological parameter seen in the corresponding person term (E.g. in American Sign Language, the handshape of *father* is the same as the handshape of *man*), then semantic derivation from person term was coded as ‘yes’. But if the phonological parameter of a parental term examined was not the same as the person term, then it is coded as ‘no’ (E.g. the location of *father* differs from the location of *man* in Chinese Sign Language). If any formational properties of parental terms overlap with person terms, this suggests the behavior could be semantically related.

Both parental and person terms were also coded based on the motivation of sign formation. If the term appeared to be motivated by either physical attribution or cultural attribution, then they were coded as such and described. Coding for physical attribution reflects two types of descriptions: a male’s mustache motivates the sign for *father* in Argentinean Sign Language, and denoting the shape of breasts motivates its sign for *mother* in Ugandan Sign Language. Cultural attribution can be illustrated by the nose piercing that denotes female in Nepali Sign Language, which is not conceived in a similar way to represent femaleness in the cultural framework of European societies, for example. Comparison of the phonological structures of both parental and person terms

- 3) Gender of kin term: Differentiating gender by denoting male, female or neutral
- 4) Gender of linking relative: Specifying gender of the lineage in relation to the kin term. (E.g. maternal uncle: the lineage is through the female kin member. Elder brother's wife: the lineage is through the male kin member)
- 5) Lineality: If the kin term is lineal, then which type of descent is this relation (E.g. great-grandmother: ascending)
- 6) Collaterality: If the kin term is collateral, then which type of descent is this relation (E.g. nephew: descending)
- 7) Consanguineal / Affinal kin: The reference to the kin relation based on blood or marriage (E.g. brother-in-law: affinal-in-law)
- 8) Nuclear / Non-nuclear: Does the kin term refer to nuclear member or not

- 9) Social status hierarchy: Does the kin term reflect social status hierarchy
- 10) Relative age: Does the kin term reflect age in relation to Ego?
- 11) Degree of separation: What is the degree of separation between the kin member to Ego
- 12) Number status: Does the kin term reflect singular, dual, or plural

To examine the relationship a kin term specifies, its relationship within the language-specific kinship system must be determined based on these principles of kinship classification. The database provides information about the types of kinship terminologies classified in these signed languages under study.

Verifying Data

The final step entailed reviewing all databases a second time to identify and correct any potential key entry errors. Follow-up interviews with language consultants provided insights on how kin relations are actually conveyed in their respective signed language discourse. Consultations took place via webcam for easier communication to review all collected kinship terms. Consultants added more kin terms in some cases, and offered modifications of signed expressions of kin terms that were not well-represented in

the dictionary. In every case the function of kin terms in their signed languages was also discussed.

The data of these three databases were imported into Access 2007 database management system to enable the generation of sorted reports and pivot tables to examine phonological and semantic features by signed language, by term, and by feature. Patterns were described qualitatively and quantitatively in the database. The qualitative description recorded how individual signed languages encode semantic concepts through particular phonological structures. The quantitative aspect enabled patterns that cut across signed languages to be revealed. The data provided more clues about cross-linguistic and language-specific behaviors of signed languages and their typological classifications.

Validity and Reliability

Signed language dictionaries provide the validity of the databases (refer to Appendix A for the list of signed language dictionaries). Moreover, a review of kinship terminology in each signed language is verified through consultations with signers of their respective signed languages allow the data to ensure validity of the study.

Summary

The methodology used to conduct this typological analysis was premised on the theoretical framework of spoken language typology, in search of emergent patterns in signed languages individually and cross-linguistically that can be used to differentiate typology. Signed language dictionaries constrain research due to problematic inconsistencies in availability and quality; however they do provide a reasonable data

source contributing rich information of a large sampling of forty signed languages from geographically diverse regions of the world. Chapter Three addressed the methodology of this study with a description of the research design, sources of data collection, and procedures used in conducting this study.

CHAPTER 4: FINDINGS

Chapter Four focuses on findings drawn from the data corpora of kinship terminology for forty signed languages. Data analysis reveals the complexity of encoding semantic properties through a range of phonological structures within individual signed languages and cross-linguistically as well.

Data Analysis

Examining the classificatory system of kinship and its terminology of signed languages entailed a series of analyses. First, language sampling identified how many and what person and kin terms were found in each signed language dictionary and included a discussion about the distribution of person and kin terms. The image schemas in person terms for *man* and *woman* were also examined. Second, analysis of phonological parameters compared to semantic domains provided evidence of emerging patterns of semantic extension and semantic derivation in lineal kin terms. Third, classification of signed languages determined language type similar to Greenberg's 1966 analysis of kin types of spoken languages.

Counts and Image Schemas

Count of Person Terms: Analyzing Patterns in the Domain of Person Terms

The first analysis counted tokens of person terms in each signed language dictionary. In some cases, a person term may be semantically extended to a kin term, and these kin terms were identified as person terms. For instance, Namibian terms for *man* and *woman* extended to *father*, *husband* and *mother*, *wife*. These two lexical entries were

coded as person terms. Appendix F Table F1 provides an overview the distribution of count of person terms reported in signed language dictionaries.

The distribution of person terms in these signed languages ranged from two to eight. Of 21 of the 40 signed languages under study, 21 contained four person terms including: *man*, *woman*, *boy*, and *girl*. Argentinean, Israeli, and Thai Sign Languages reported three person terms. While there were two lexical variants of *man* and one lexical variant of *woman* in Israeli Sign Language, there were two lexical variants of *woman* and one lexical variant of *man* in Argentinean Sign Language. Thai Sign Language reported lexical entries for *man*, *woman*, and *girl*, but did not include a lexical entry for *boy*.

Some signed languages contained more than one lexical variant for *man*, *woman*, *boy*, and/or *girl*; leading to a higher count of person terms than four terms. The highest reported person terms in a given signed language dictionary was Australian Sign Language with eight kin terms. New Zealand Sign Language contained the second highest set of seven person terms. German and Nepali reported six person terms, while five person terms were identified in Brazilian, British, and Namibian Sign Languages. In contrast, the lowest reported person terms were *man* and *woman*; reported in eight signed languages including: Croatian, Ho Chi Minh City, Hong Kong, Italian, Mongolian, Quebec, Swedish, and Tibetan.

The distribution of lexical units in the set of person terms showed that most person terms were expressed as one lexical unit. Out of 44 forms for *man*, 42 forms were produced as one lexical unit while two forms in Nepali and Russian were constructed of

two lexical units. Similar to *man*, 43 forms for *woman* depicted a strong bias in its expression as one lexical unit, while four forms were constructed of two lexical signs. These four terms for *woman* produced with two lexical units were reported in Croatian, Nepali (two lexical variants), and Russian. Based on the distribution of *man* and *woman* a strong preference was indicated for formation as one lexical unit.

Similar to forms of *man* and *woman*, the forms for *boy* and *girl* demonstrated a similar preference for one lexical form with 77% of the set of *boy* terms (with 24 tokens) and 69% of the set of *girl* terms (with 22 tokens). 23% of *boy* terms and 31% of *girl* terms consist of two lexical units. The distribution indicates a higher proportion of forms consisting of two lexical units in the signs for *boy* (seven tokens) and *girl* (ten tokens) compared to *man* (two tokens) and *woman* (four tokens). Comparison of this distribution suggests that constructions of two lexical units were more likely to denote *boy* and *girl* than *man* and *woman* within the domain of person terms. The cross-linguistic patterns of offspring and parental terms in signed languages reflects similarity to Greenberg's finding that ascending kin terms are unmarked compared to marked kin terms seen in descending generations in spoken languages.

Comparison of the phonological structures of *boy* and *girl* with forms of *man* and *woman* inform how signed languages construct *boy* and *girl*. The first set involved forms of *boy* and *girl* that were expressed by one lexical unit; leading to two subsets defined by phonological formation of *boy* and *girl*. The first subset concerned forms of *boy* and *girl* that were produced distinctly from *man* and *woman*; illustrating no phonological overlap between *boy* and *man* and *girl* and *woman*. The second subset included forms that

depicted phonological overlap between *boy* and *man* and *girl* and *woman*. The second set encompassed constructions of *boy* and *girl* with two lexical units.

Analysis of the phonological structures of *boy* and *girl* with *man* and *woman* provide insights discerned from the emerging patterns of semantic derivation of the person terms of signed languages. The first set involved distinct forms of *boy* and *girl* that illustrate no phonological overlap with *man* and *woman* as described in Appendix F Table F2.

Ten signed languages reported distinct forms for *boy* or *girl*; indicating no phonological overlap with the person terms of *man* and *woman*. Six signed languages expressed forms of *boy* distinct from *man* as reported by French, Irish, Nepali, New Zealand, Persian, and Ugandan. Nine signed languages produced forms for *girl* distinct from *woman*. Four signed languages contained distinct forms for *boy* and *girl*; including Irish, New Zealand, Persian, and Ugandan. The evidence of no phonological overlap in *boy* and *man* and *girl* and *woman* illustrated that terms of *boy* and *girl* were not semantically derived from terms of *man* and *woman*.

The second subset contained forms for *boy* and *girl* that showed phonological overlap with the forms for *man* and *woman*. The evidence of phonological overlap indicated *boy* and *girl* were semantically derived from *man* and *woman*. Appendix F Table F3 examines phonological overlap observed in forms for *boy* and *man*.

The distribution of phonological overlap of *boy* and *man* revealed that 15 signed languages that exploited the location of *man* to form *boy*. Three signed languages, Dutch, ISPL-Bangalore, and Korean, overlapped in handshape. Furthermore, Dutch and IPSL-

Bangalore forms of *boy* overlapped in both handshape and location of *man*. Location and movement of *man* were exploited to produce *boy* in Brazilian, Finnish, Kenyan, and Tanzanian signed languages. Data showed no evidence of phonological overlap of internal movement in *boy*. The derivation of location indicated a pervasive motivation in constructing *boy*; suggesting location denotes a semantic property of *male*.

The forms of *girl* contained phonological overlap with *woman* and their patterns are described in Appendix F Table F4. Patterns of phonological overlap of *girl* and *woman* were revealed by signed languages that exploited location of *woman* to produce *girl*. The German form of *girl* overlaps in location and handshape with the German form of *woman*. Overlapping only in handshape was reported in Korean Sign Language. The French form for *girl* exploited both location and path movement of *woman*. One lexical variant of the Nepali term for *girl* overlapped in handshape, location, and path movement with *woman*.⁴¹ No evidence of a phonological overlap of internal movement was found for the term *boy*. Similar to findings for *boy*, the distribution of phonological overlap in *girl* reveals that location is the most pervasive phonological property exploited from *woman*; indicating location motivates the semantic property of *female*.

Forms of *boy* and *girl* demonstrate overlap by phonological features seen in terms of *man* and *woman* in some signed languages. The evidence of phonological overlap

⁴¹ The comparison of the phonological structures of *girl* and *woman* in Nepali Sign Language showed illustrates an identical form except that *woman* was is formed by two components of *female* and *human* as *girl* had is constructed of a simple form of *female*.

indicates that the forms of *man* and *woman* motivate forms of *boy* and *girl*, and that semantic derivation took place. Cross-linguistic examination of the formal properties of *boy* and *girl* with *man* and *woman* reveal that location was most likely to be exploited to construct *boy* and *girl* as compared to other phonological features.

Some signed languages produce *boy* and *girl* with two lexical units; realized with person terms of *man* or *woman*. Expressions of *boy* and *girl* that are sequentially constructed from *man* and *woman* and another sign are described in Appendix F Table F5.

Nine signed languages produce *boy* and *girl* sequentially from two lexical signs. The forms of *boy* and *girl* express person terms for *man* or *woman* and another lexical unit mapped to the conceptual domain of *child*. The realization of *child* depicts the conceptualized physically short height of a young child. While nine signed languages sequentially constructed *man* and *child* to denote *boy*, eight signed languages form *girl* with a juxtaposition of *woman* and *child*. The conceptual domain of *child* cuts across different geographical regions; suggesting that the description of *child* reflects a physical relationship relative to the physical height of a mature adult as compared to a young child. As the description of *child* mirrors the physical description of a child's short height, it appears to draw from the universal physiobiological experience of all humans.

The range in number of person terms indicates variation among these languages. Most signed languages formally express *man* and *woman* by one lexical unit while *boy* and *girl* constructs from either one or two lexical signs. The forms of *boy* and *girl* are realized by different formal expressions. Some forms are produced distinctly from *man*

and *woman*, depicting no phonological overlap. Some terms of *boy* and *girl* derived from *man* and *woman* as these forms contain phonological overlap and semantic derivation. Some constructions of *boy* and *girl* juxtapose two lexical signs of *man* or *woman* with a form of *child*. Cross-linguistic examination revealed that 40 signed languages produced person terms in a range of different types of formal expression.

Analysis of person terms revealed that all signed languages differentiated gender of person terms as construed by two separate forms of *man* and *woman*. Evidence of distinction of gender in person terms affirms the inherent and universal property of biological sex of the human population is reflected in language. While some signed languages discriminate gender only in person terms as expressed in *man* and *woman*, some signed languages encode both gender and relative age in person terms as illustrated in terms for *boy* and *girl* compared to *man* and *woman*. The property of relative age in person terms is not encoded in all signed languages' person terms; indicating that overt coding of relative age of person terms is not universal. Relative age is instead a language-specific grammatical property, whether its language encodes the semantic distinction or not.

Image Schemas of Man and Woman

Data shows that image schemas of *man* and *woman* are framed by salient semantic properties that cut across signed languages. The analysis of the formal expressions of *man* and *woman* uncovered formal image schemas motivated by properties. Image schemas in *man* and *woman* revealed interesting patterns that merit further description.

Examination of formal properties encoded in *man* informs us how image schemas were constructed in 40 signed languages. Patterns revealed that the schematization of *man* was framed by physiological and cultural-specific iconic properties; illustrated in Appendix F Table F6.

Image schemas for *man* distributed across iconic types used to encode *man*. The most pervasive schema rested on the male physique of either *beard* or *mustache* or a more generic physical description of *hair* observed in 25 signed languages. Among these 25 signed languages, these forms of *man* clearly demonstrated a schematization that exploits physical characteristics of male human population. In contrast, nine signed languages produced *man* on the forehead, which may be attributed to a folk etymology of *tipping men's hat*. The remaining 7 signed languages expressed *man* by different formal properties; mapping to different conceptual domains. The schematized forms are illustrated in Figures 2-5:



Figure 2: Afghan beard



Figure 3: Persian mustache



Figure 4: Chinese hair



Figure 5: Dutch tipping-men's hat

Eleven signed languages form *man* on the chin area, motivated by the metonymic concept of *beard* to represent *man*. While eleven forms were found to have exploited the chin area to mark the semantic property of *man*, their formal properties of handshape and movement varied. Similar to *beard*, another image schema of male physique metonymically maps to the iconic description of a mustache in eleven signed languages. The location of the upper lips and the side of cheek motivate the form of *man*; mapping to the conceptualized property of a *mustache*. Three signed languages draw on the salient property of *hair* to denote *man*. Although *hair* is a general physical description that is not unique to male human population, the property of *hair* metonymically maps to the schema of a physical description similar to *beard* and *mustache*. In total, 25 signed languages were found to exploit the metonymic concepts of male physique to encode *man*, illustrating a robust schematization across signed languages.

Another image schema for *man* involves the folk etymology of *tipping men's hat*. The formal description of *tipping men's hat* depicted in all variants locates on the

forehead. Some variants show with a straight movement from the forehead to neutral space while some variants express no path movement. Most variants overlap with an open hand in the initial position then close into a flat closed hand in the final position. Nine signed languages prevalent in North Europe, the US, and Canada produce lexical variants of *tipping men's hat*.

The metonymic representation of *tipping men's hat* is best described as folk etymology as no written account of its origin exists, but rather that the form of *man* was derived from the schema of *tipping men's hat* is anecdotal. Deaf people typically explain the form of *man* origination by the cultural characteristic of men wearing hats and tip the hat when men greet other people. As historical accounts of signed language descriptions are scarce, it is extremely difficult to trace the actual origin of the motivation for the form of *tipping men's hat*.

Cross-linguistic examination of the formal properties of *man* showed pervasive patterns of iconic properties schematized in these forms. Iconic properties illustrate two possible frames of image schemas motivated by human physiobiological properties and cultural-specific properties. Within the domain of *man*, 22 signed languages were found to frame *man* by the physiological description of a *beard* and a *mustache*. The physiological characteristics of man's beard and man's mustache underscore a characteristic unique to male human population; motivating the semantic property of *male* prevalent in signed languages. Another semantic domain of *man* was found to be framed by a cultural-specific schema of *tipping men's hat* in nine signed languages predominantly of North Europe, the United States, and Canada. While the form for

tipping men's hat is manifested in a specific set of signed languages, they share a common geographic region. This suggests that geographic proximity specifies the cultural framework, while potential factors of historical relationship and/or language borrowing may account for other signed languages.

Patterns of formal properties encoded in *woman* informed the types of image schemas by physical and cultural-specific characteristics attributed to women. The distribution of image schemas of *woman* is described in Table F7.

The image schemas for *woman* distributed across a range of schema types to encode *woman*. The most pervasive schema found rests on the female physique with *breast* or a more generic physical description of *hair* observed in 15 signed languages. Among these 15 signed languages, these forms of *woman* clearly found to demonstrate a schematization by exploiting physical characteristics of the female human population. In contrast, 10 signed languages produce *woman* by cultural specific descriptions of *earring*, *nose piercing*, and *hijab*. A folk etymology for *bonnet strings*, *woman's soft cheek*, and *hair curls on woman's cheek* used to represent *woman* may be accounted for in 15 signed languages (Kyle & Woll, 1985). The remaining three signed languages express *woman* in different forms motivated by different semantic domains. The schematized forms for *woman* are provided in the following Figures 6-11:

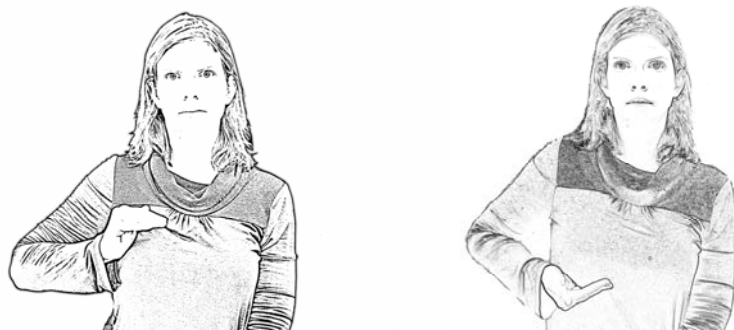


Figure 6: Danish breast



Figure 7: Afghan hair



Figure 8: Chinese earring



*Figure 9: IPSL-Karachi
nose piercing*



Figure 10: Persian hijab



Figure 11: French folk-etymology

Fifteen signed languages were found to produce *woman* by mapping to physical attributions associated to women. Thirteen signed languages of Africa and North Europe form *woman* on the breast area; mapping onto the framework of female's physique (*breast*).⁴² The form of *breast* metonymically represents a female human as the physical description of *breast* is exploited to specify the female. Afghan and Tibetan map to the

⁴² While British, Australian, and New Zealand produced *woman* on the ipsilateral chest area, this form does not explicitly depict the shape of *breast*. Two possible explanations for this phenomena may be accounted by: 1) historically motivated by *breast* but experienced extensive degeneration of an iconic form leading to an opaque form, 2) mapped to a different image schema than the schema of *breast*.

iconic property of the *hair* length (or possibly *headdress*) representing the concept of *woman* with a full hand moving from the top of the head to the shoulder. The schemas of physical description attributed to women drove the form of *woman* in 15 signed languages, indicating a robust schematization across signed languages.

The distribution of *woman* revealed different types of schematizations motivated by cultural-dependent frameworks. As there were variations in schemas, forms for *woman* express salient, iconic properties of *woman* that are determined by their cultural frameworks. Signed languages were found to form *woman* by mapping to metonymic representations of a concrete item or behavioral traits that are attributed to women. Ten signed languages formed *woman* by mapping to concrete descriptions of *earring*, *nose piercing*, and *hijab*.

Seven signed languages exploited the metonymic concept of *earring* to produce *woman*. The form for *woman* conveyed the iconic description of a woman's earring; expressed with a closed thumb and index finger located on the ipsilateral ear. The representation of *earring* for *woman* was noted in geographic regions of Far East Asia, Central America, Europe, and the Mid East.

Two signed languages of IPSL-Karachi and Nepali formed *woman* by the metonymic form of *nose piercing*. The form *nose piercing* realizes with an index finger pointing at the ipsilateral side of the nose; representing the cultural framework associated to Pakistani and Nepali women. Persian Sign Language denotes *woman* by mapping a metonymic form of *hijab*. The iconic form for *hijab* clearly depicts a headscarf worn by Iranian women, indicating a mapping by the cultural-specific framework in the Persian

culture. Argentinean Sign Language maps to the metonymic form of *lipstick* to form *woman*. The motivation of *lipstick* exemplifies the characteristic behavior of Argentinean women putting lipstick on their lips (Druetta, personal communication). The form of *woman* appears to be motivated by a culturally specific, iconic description framed by each cultural framework that may not always be transparent to different cultures.

Among 15 signed languages that produced *woman* on the ipsilateral cheek, most variants overlapped with an index finger brushing on the cheek. While a few variants differed in handshape or movement, all forms were located on the ipsilateral cheek. Kyle and Woll (1985) described the British form etymologized by three possible motivations: *bonnet strings*, *woman's soft cheek*, and *hair curls on woman's cheek*. The British description of folk etymology may apply to all signed languages of the same phonological form as the folk etymology of *bonnet strings* has been noted in the form *woman* in American Sign Language (Frishberg, 1975; Swisher, 1988). While British and American used the folk etymology of *bonnet strings* to account for the form for *woman*, both signed languages are not genetically related. The form of *woman* located on the cheek was noted in all geographic regions except for Africa and Far East Asia.

The limited variability of image schemas found for *man* and *woman* reinforce the notion that signed languages do exploit salient iconic properties that undergo schematization to form signs. The few variations manifested in image schemas of *man* and *woman* could be accounted for by the visual-spatial modality. Signed languages are visually orientated, and the visual orientation itself drives the selection and schematization of characteristics associated to objects, referents, and etc. Out of 40

signed languages, 25 signed languages encoded *man* by physical appearance while 15 signed languages formed *woman* by physical descriptions. In contrast, forms framed by cultural-dependent descriptions were found in nine signed languages for *man* and 26 for *woman*. This finding revealed that most signed languages use distinctive properties of *man* and *woman* on the face.

Count of Kin Terms

Data included all terms that specified kin relations including: *mother*, *father*, *grandson* (E.g. *daughter's son*), *sister-in-law* (e.g. *husband's sister*). Data also contained terms for *family*, *extended family*, *relatives*, *in-laws*, and *parents*. Terms for *fiancé*, *fiancée*, *adult*, *child*, and *person* were excluded from the data collection.

Each kin term was coded by how many sign forms were realized in a specific kin term. If a kin term contained two distinct forms, then the kin term was coded as two lexical units. In some cases, counting lexical units in a kin term posed challenges. Beyond the potential downfall that signed language dictionaries may misrepresent kin terms, one problematic issue concerned kin terms constructed by compounding (E.g. the Norwegian form for *daughter* was constructed with two components of [*girl* + *child*]). Compounded forms were categorized as one lexical unit based on phonological structure and semantic change encoded in the form compared to a term constructed of two distinct signs.⁴³

⁴³ When compounding takes place, the form experiences internal changes in phonological structure. Compounding process drives the juxtaposition of two distinct forms to undergo internal changes.

Data included all kin terms and also coded all lexical variants of kin terms found in signed language dictionary sources. For instance, Australian reported three variants of *aunt*, and these three lexical variants were counted separately. The count of lexical entries contained all lexical variants of kin terms as shown in Appendix F Table F8.

The number of kinship terms in the signed languages studied ranged from 6 to 58. The highest reported number of kin terms in a given signed language dictionary was Nepali Sign Language with 58 kin terms. Mexican Sign Language contained the second highest set with 46 kin terms. The smallest reported kinship terminology was shown in Croatian Sign Language with 6 kin terms. The second least kin terms was evidenced by 8 terms in Persian Sign Language. The range in number of kin terms clearly demonstrated variation among languages.

Investigating the count of lexical units in kin terms demonstrated that most kin terms were constructed of either one or two signs. The largest set of kin terms produced with one lexical unit as evidenced by 55.7% or 521 kin terms out of 936 kin terms. The kin terms with two lexical units produced the second largest set with 39.5% or 370 of 936 kin terms. In contrast, the kin terms with three lexical units constructed only 4.2% or 39 of 936 kin terms. The kin terms with four lexical units formed only 0.6% or 6 of 936 kin terms. No evidence that five or more lexical units were used to construct kin terms was discovered.

Semantic Derivation and Extension in Signed Kinship Terminology

Semantic Derivation of Parental, Grandparental, and Offspring Terms from Person Terms

An analysis of the semantic derivation of kin terms requires comparing the phonological structures of person terms in terms of how signed languages construct parental, grandparental, and offspring terms. If parental, grandparental, and offspring terms demonstrate overlapping phonological structures with those seen in person terms, then these shared phonological features suggest semantic derivation has taken place. In contrast, kin terms that contain no phonological overlap indicate that they have not been semantically derived from person terms. Comparing the phonological structures of parental, grandparental, and offspring terms with the structures of person terms, provides insights based on the emerging patterns of semantic derivation discovered in signed kin terms.

Comparison of the phonological structure of person terms with parental, grandparental, and offspring terms identified three sets of phonological formation: *holistic*, *phonological overlap*, and *no phonological overlap*. Appendix F Table F9 summarizes the distribution of phonological formation of 40 signed languages.

This distribution by semantic derivation of person terms reveals patterns. Holistic forms indicate that a person term was semantically extended to a kin term. For instance, a Kenyan term for *man* extended to *father*; preserving the holistic phonological form of *man* identically in *father*. This distribution of holistic forms illustrates person terms were exploited to construct paternal, grandparental, and offspring terms.

Offspring terms contained the highest incidence of person terms employed as compared to parental and grandparental terms. Out of 35 male offspring terms, 15 expressed male person terms of *boy* and *man*; totaling to 42.9% of all male offspring terms. Out of 37 female offspring terms, 15 contained person terms of either *girl* or *woman*. 40.5% of female offspring terms were constructed with a person term; indicating a similar pattern between male and female offspring terms. According to the distributive analysis in this study, semantic extension of person terms robustly produced offspring terms.

The lowest reported count of holistic forms was in the set of three *grandfather* terms; totaling 5.8% of the set of 52 terms for *grandfather*. The female counterpart *grandmother* contained five out of 53 terms constructed with a holistic form of female person term; totaling 9.4% of *grandmother* terms. Only six of 54 male parental terms conveyed semantic extension of a male person term. Only 11.1% of *man* semantically extended to *father*; similar to the female counterpart of *woman* and *mother*. Due to the low reported count in the distributional analysis, semantic extension of person terms does not productively construct parental and grandparental terms.⁴⁴

The kin terms that contained phonological overlap included terms that conveyed, at minimum, one phonological feature that was also seen in the person term. However, this set excluded all kin terms that were semantically extended by person terms. The

⁴⁴ It is unknown if the signed languages' pattern of {offspring terms < person terms, but ascending terms do not derive from person terms} are also found in spoken languages.

highest reported count of phonological overlap was observed in *father* terms motivated by *man*. Out of 54 terms for *father*, phonological overlap of the person term *man* motivated 44.4% (24 terms) of the forms for *father*, indicating of high degree of phonological overlap. This finding suggests that some signed languages exploit at least one phonological feature of *man* to form *father*; illustrating semantic derivation took place.

Female offspring terms demonstrated the lowest reported count of phonological overlap with only four terms overlapping with at least one phonological feature of the person term of *girl*. While 10.8% of female offspring terms showed phonological overlap with the person term, the male offspring terms conveyed the second lowest reported count of five out of 35 terms or 14.3% containing phonological overlap with the male person terms. The low count of phonological overlap observed in offspring terms suggests that different semantic domains motivate offspring terms. (but the low percentage of phonological overlap must be put in context of the high percentage of holistic terms)

The third category encompassed parental, grandparental, and offspring terms that did not demonstrate any phonological overlap with person terms. The highest reported count of no phonological overlap was observed in the set of terms for *grandmother* as these 38 forms or 71.1% for *grandmother* were not motivated by the female person term, suggesting that semantic domains other than person term motivated these 53 terms across the 40 signed languages studied. Similar to *grandmother*, 52 terms of *grandfather* contained 36 terms or 64.8% that did not express phonological overlap with the male

person term *man*. Both sets of grandparental terms contained the highest percentage without phonological overlap with person terms, indicating that domains other than person terms are used to construct grandparental terms.⁴⁵

Male offspring terms contained the lowest reported count terms without phonological overlap. Out of 35 male offspring terms, 15 or 42.9% did not overlap with the person terms for *man* or *boy*. Female offspring terms with 18 terms or 48.6% of the 35 female offspring terms constructed without phonological overlap with a female person term. This category reflects a range of 42.9% to 71.7% of parental, grandparental, and offspring terms that were not phonologically overlapped with person terms; suggesting semantic domains other than person terms were used in their construction. Cross-linguistic patterns illustrate that offspring terms are either holistic or unrelated, and rarely derived from person terms.

The patterns of phonological structures revealed in parental, grandparental, and offspring terms demonstrate the distribution of holistic forms, phonologically overlapped forms, and forms with no phonological overlap. The holistic form indicates the percentage of designated person terms semantically extended to designated kin terms. Kin terms that could not be considered holistic, but contained some phonological overlap

⁴⁵ While other domains have not yet been examined in grandparental terms, one possibility would be constructed with the term of *old*, as spoken languages construct grandparental terms with the term of *old*. The analysis of grandparental terms constructed with other semantic domains merits further investigation in signed languages.

of some phonological features similar to the corresponding person term; illustrating these kin terms were semantically derived from person terms. Some kin terms displayed no phonological overlap with person terms; signifying that these kin terms were not motivated by person terms, but instead constructed using different semantic domains.

Patterns of semantic derivation explored address two points of interest. Identifying which kin terms contain phonological overlap was the first goal, while determining which phonological feature motivated semantic derivation of person term across each signed language was the second goal. These investigations of semantic extension and semantic derivation provide more clues regarding the interaction between semantic domains with phonological properties in signed languages' kinship terminology.

Semantic extension of Person Terms to Parental, Grandparental, and Offspring Terms

The first analyses concerned patterns observed within the domain of parental, grandparental, and offspring terms; counting how many kin terms were semantically extended from person terms across 40 signed languages. This count included the number of person term forms that were preserved holistically in kin terms without modification to the phonological structure of the person term. The semantic extension of person terms used to construct parental, grandparental, and offspring terms from person terms is shown in Table F10.

Table F10

Distribution of semantic extension of person terms used to construct kin terms

	<i>Man/Male</i>	<i>Woman/Female</i>	<i>Boy</i>	<i>Girl</i>
<i>Father</i>	6			
<i>Mother</i>		6		
<i>Grandfather</i>	3			
<i>Grandmother</i>		5		
<i>Son</i>	12		3	
<i>Daughter</i>		12		3

Within the set of terms for *father*, six signed languages semantically extended *man* to construct *father*. These six signed languages were Brazilian, Kenyan, Namibian, Nepali, Tanzanian, and Turkish. Similar to *father*, six signed languages mapped the person term of *woman* to construct *mother*. These six languages were consisted of Brazilian, IPSL-Karachi, Kenyan, Namibian, Nepali, and Ugandan as described in Table F11.

Table F11

Distribution of constructing parental terms by semantic extension of person term (holistic form)

Parental Term	<i>father</i>	<i>mother</i>
	<i>man</i>	<i>woman</i>
<i>parent</i>	Brazilian	Brazilian
	Nepali	Nepali
<i>giving-birth</i>	(Ugandan*)	Ugandan
compositional form		IPSL-Karachi
freestanding (polysemous) form	Namibian	Namibian
	Kenyan	Kenyan
	Tanzanian	
	Turkish	

Note: While the term of *father* in Ugandan Sign Language appears to originate as a semantic extension of *man*, its form illustrates a slight change in handshape from *father* as compared to *man*.

Brazilian and Nepali Sign Languages realized semantic extension in both parental terms for *father* and *mother*; constructed of person term adjacent to another lexical unit of *parent*. Ugandan formed *mother* by a juxtaposed construction of *giving-birth* following *woman*. Similar to the construction of Ugandan's term for *mother*, *father* formed with

two terms of *man* and *giving-birth*. Although the Ugandan term for *father* contains the form of *man*, the handshape of *man* has been modified. Due to this phonological change in handshape of *man*, the Ugandan *father* term does not demonstrate phonological retention of the holistic form of *man*; causing *father* to be categorized in another category where only some phonological overlap exists between person and parental terms.

The IPSL-Karachi form for *mother* derives from the female person term, where the componential form of *mother* is constructed of two components of a lexicalized sign. The first component of *mother* overlaps with the form of *woman*, while the second component of *mother* appears not to be motivated by any semantic domain (Zeshan 2000). Cross-linguistic examination reveals that the form of *mother*, composed using a person term, has been fused with another component only observed in IPSL-Karachi.

The other five languages demonstrating semantic extension of person terms to construct *father* by a freestanding form include: Brazilian, Namibian, Kenyan, Tanzanian, and Turkish. The Namibian form for *man* was identical to the form for *father*; illustrating polysemy in the form of *man* semantically extended to *father* and *husband*. The Namibian pattern of holistic formation also applies to *woman* and *mother*. Other examples of polysemy was observed in Tanzanian terms for *man*, *father*, and *paternal uncle*. Tanzanian displays a holistic gestural form with phonological similarities between *man* and *father* (and *paternal uncle*); demonstrating possible polysemous qualities.

Asymmetry emerged in patterns forming parental terms from person terms in IPSL-Karachi, Tanzanian, and Turkish; indicating varied motivation for formation other than person terms. The forms for *woman* and *mother* in Tanzanian and Turkish contain

no phonological overlap; suggesting the term *mother* is motivated by a different semantic domain. In IPSL-Karachi, no evidence of phonological overlap exists between the form for *man* and *father*. While Ugandan’s term for *father* constructs similar to *mother*, the form of *man* in *father* experiences phonological modification to its handshape. Due to this change in the handshape, the Ugandan term for *father* was categorized with those kin terms that contain only some phonological overlap but do not retain the holistic form of *man* in its construction.

Patterns in grandparental terms reveal the exploitation of person terms constructed in other sign languages. The three languages of Kenyan, Namibian, and Nepali all realize *man* in the construction of *grandfather*. The five signed languages that map the form of *woman* to constructions of *grandmother* include: IPSL-Karachi, Kenyan, Namibian, Nepali, and Ugandan, described in Table F12.

Table F12

Distribution of semantic extension of person terms in grandparental terms

	<i>man</i>	<i>woman</i>
<i>old</i>		Ugandan
<i>holding-a-stick</i>	Kenyan	Kenyan IPSL-Karachi
<i>depiction-of-an-old-crooked-body</i>	Nepali	Nepali
<i>free-standing form</i>	Namibian	Namibian

According to this paradigm, person terms motivate grandparental terms in five signed languages. Except for Namibian, these signed languages exploit the semantic domain of *old* by different forms; using person terms to sequentially construct grandparental terms. Ugandan grandparental terms express a person term and the lexical unit of *old*. Kenyan produces parental terms with an iconic depiction of *holding-a-stick*. The metonymic form of *holding-a-stick* alludes to an image of an elderly person walking with a stick for support. Nepali maps grandparental terms to the iconic form of *old-person* suggested by a curved index finger representing an old, crooked body; to evoke a semantic property of *old-person* and indicate semantic extension took place.⁴⁶ As different metaphorical variations evoked the property of *old*, these forms may either be lexicalized and/or depictive properties of individual signed languages.

In contrast, Namibian realized *grandfather* and *grandmother* as one lexical unit. Namibian's grandparental terms form with a non-dominant hand wrapped over the dominant hand. While the dominant hand marks parental terms, the non-dominant hand specifies second ascending lineal kin relations through the lateralization of the chest marked gender. The function of the non-dominant hand suggests a morphological property marking grandparental relations. As evidenced, some grandparental terms map person terms of *man* and *woman* to construct *grandfather* and *grandmother*.

⁴⁶ Green (2008) proposed two possible explanations for grandparental terms. The first explanation involved phonological reduction by no formal expression of *parents* while the second explanation concerned the semantic extension of *old person* to *grandparents*.

Findings illustrate that the first set of grandparental terms are constructed by juxtaposing person terms with the form mapping to the property of *old*. Another set of grandparental terms are formed by retaining the person term, but are realized with additional morphological features to mark *grandfather* and *grandmother* as in Namibian Sign Language. Grandparental terms exploited person term to mark gender.

In the domain of offspring terms, patterns show offspring terms mapped with person terms of *man*, *boy*, *woman*, and *girl* (refer to Table F13). Except for Tanzanian, all languages construct offspring terms with both person terms and another lexical unit. Tanzanian's term for *girl* semantically extends to *daughter*. Person terms productively use both *son* and *daughter*.

The term *son* divides into two sets involved in mapping both *boy* and *man*. Three languages (Danish, Kenyan, and Ugandan) realize *son* by constructing it from *boy*. In contrast, 12 languages constructed *son* using the term of *man*. Languages that form *son* from *man* along with another sign include: Afghan, Bulgarian, Chinese, Croatian, Ho Chi Minh, Hong Kong, IPSL-Bangalore, IPSL-Karachi, Mongolian, Nepali, Quebec, and Turkish. The person term *man* robustly produces *son* in 12 languages compared to 3 languages that exploit the term *boy*.

Both person terms *girl* and *woman* are used to construct *daughter*. While Tanzanian semantically extends *girl* to denote *daughter*, Kenyan and Ugandan signed language construct *daughter* from the form of *girl* and another lexical unit. Similarly constructed with another lexical unit, the term of *woman* robustly produces daughter in 12 other languages consisting of Afghan, Bulgarian, Chinese, Ho Chi Minh, Hong Kong,

Mongolian, Nepali-1, Nepali-2, Quebec, and Turkish.⁴⁷ *Woman* is productively used in the construction of *daughter* in 12 languages as compared to only three languages that form *daughter* using *girl*.

Patterns reveal the exploitation of person terms in the formation of offspring terms. Except for the term for *daughter* in Tanzanian, all offspring terms also construct using another lexical unit in addition to a person term. Cross-linguistic patterns reveal that the second lexical unit in these offspring terms are motivated by several different semantic domains described in Appendix F Table F13.

The paradigm illustrated by patterns of person terms constructed with another lexical unit appears across 15 signed languages. Formed with person terms, the semantic domains of *baby*, *giving-birth*, and *child* productively construct offspring terms. Iconic properties motivate the forms for *baby*, *birth*, and *child* as these inherent properties draw from perceived universally-human cognitive experiences.

The domain of *baby* is conceptualized iconically by the act of cradling a baby in the hands and/or arms. This depiction also reflects the property of the small size of the conceptualized baby. In turn, inherent properties of the concept of *baby* motivate the formational properties for the form of *baby*. The term *baby* juxtaposes either the female or male person term to express offspring terms in IPSL-Karachi, Mongolian, and Nepali.

⁴⁷ The Nepali Sign Language dictionary reported two lexical variants of *daughter* as these two variants were formed by two lexical variants of *woman*.

The form for *giving-birth* derives from an iconic representation of the act of giving birth. Two distinct variations of *giving-birth* exist. The first variant is produced using hands moving from the belly area to neutral space. Framed by the perspective of a conceptualized mother giving birth to a baby, this variant depicts the universal human event of giving birth. Construed by a different frame of reference, the second variant of *giving-birth* depicts the birth event without reference to the actor (signer). For instance, Hong Kong conveys *giving birth* using the dominant hand representing the person term moving out of the non-dominant fist depicting a body cavity. The juxtaposition of *giving-birth* and either *man* or *woman* constructs offspring terms in Bulgarian, Hong Kong, ISPL-Bangalore, and Israeli. Instead of *man* or *woman*, Ugandan uses either *boy* or *girl* to form *son* and *daughter*.

The form for *child* maps to a conceptualized, metonymic form reflecting the property of the short height associated with young children. The inherent properties construed in the concept of *child* involve age and height relative to adult humans. There appears to be a linear correspondence between relative age and height, as a child's younger age also reflected the child's shorter height. The form of *child* reflects *a person whose height is short* mapped to young age as traits of a child. The mapping of this form across various signed languages underscores the universal cognitive human perspective that children's height is typically shorter than adults.

Based on the correlation between young age and the diminutive property of height attributed to children, the conceptualized representation of *child* exemplifies the metonymic form of the short height of a *child* in five signed languages. Kenyan

juxtaposes the form of *child* with a person term of *boy* or *girl*, while Danish contains one lexical variant of *son* that expressed *boy* with the form of *child*. Chinese, Ho Chi Minh, and Turkish produce offspring terms using *man* or *woman*. Both the term of *child* and person term productively form offspring terms.

Two other sets of offspring terms involve terms of *offspring* and the 1st person possessive pronoun in Croatian and Afghan Sign Languages respectively. While Croatian offspring terms juxtapose two lexemes of *offspring* and person term, the word order differs between *son* and *daughter*. The Croatian term for *son* realizes its person term following *offspring*. In contrast, the Croatian term for *daughter* reverses the order so that the person term precedes *offspring*. Person terms function to discriminate between the genders of offspring referents in Croatian Signed Language.

Afghan offspring terms are produced using a person term and a grammatical sign of a first-person singular possessive pronoun; constructing *son* from: [*man*] [*1.p-poss-pronoun*]; and *daughter* from: [*woman*] [*1.p-poss-pronoun*]. Not only in signed languages, extension of person terms to kin terms is also observed in English spoken language. Person term constructions with possessive morphemes construe kin relations as illustrated in spoken English: *my man*, *my woman*, *my girl*, and *my boy* (Croft, personal communication). Offspring terms constructed with 1st person possessive pronouns was only found in Afghan Sign Language.

Person terms robustly produce the domain of offspring terms. The holistic form of person term retention in phonological forms of *boy*, *girl*, *man*, and *woman* express adjacent to another lexical unit referencing another domain. Patterns involving the second

lexical unit reveal prevalent semantic domains including *baby*, *giving-birth*, and *child* in offspring terms. These semantic domains illustrate salient, iconic schemas juxtaposed with person terms.

Patterns exemplify person terms semantically extended to construct parental, grandparental, and offspring terms. The function of a person term in these kin terms differentiates the genders of kin referents. However, not all languages examined demonstrate the same pattern of construction in kin terms. While there were corresponding gender terms in most signed languages, some languages produced not only one kin term, but not two (E.g. Turkish *father*, but not *mother* as the Turkish form for *mother* overlapped to a semantic domain other than person term). The distribution of semantic extension of person terms emerged across signed languages of different geographic macro-regions.

Semantic Derivation: Distribution of Phonological Overlap by Person Term in Parental, Grandparental, and Offspring Terms

This analysis examined the distribution of phonological overlap of person terms with parental, grandparental, and offspring terms. Within the set of lineal kin terms containing phonological overlap, the degree ranged from one minimal, shared, phonological overlap to one phonological overlap less than the holistic form of the person term. The set of kin terms studied with phonological overlap excluded terms that holistically represent person terms and kin terms contain no phonological overlap. Comparing phonological structures of parental, grandparental, and offspring terms with

person terms informed the relationship between two domains as shown in Appendix F Table F14.

Patterns illustrate which phonological features of person terms were preserved in lineal kin terms. The distribution revealed that phonological overlap predominately involves location and to a lesser degree, handshape. 75% of derived lineal kin terms preserve location in person terms. This finding indicates that location is the most prevalent phonological feature to mark semantic derivation. The overlap of handshape was seen in 46% of derived lineal kin terms, demonstrating that handshape also marks a semantic property manifested by person terms. Only 10% of derived lineal kin terms overlapped by path movement, and this probabilistic pattern suggests that semantic derivation does not exploit movement. There was no evidence of any internal movement utilized for semantic derivation. 24 signed languages illustrated at minimum one shared phonological feature that overlaps between parental and person terms. Analysis of the phonological structures of signed languages revealed emerging patterns in kinship terminology. The degree of phonological overlap compared one or more, but not all, phonological features between person term and kin terms. As evidenced, some parental, grandparental, and offspring terms were derived from person terms.

Patterns revealed that lineal kin terms were constructed by semantic extension and semantic derivation of person terms. Some signed languages extend person terms to construct kin terms by realizing the same form, indicating polysemy. Some kin terms juxtapose person term with another lexical unit to specify kin referents. Some kin terms derive from person terms as manifested by phonological overlap. The phonological

overlap in kin terms specifies semantic domains, leading to an organization of semantic classes within kin terms. Some kin terms demonstrate no phonological overlap with person terms, indicating these kin terms are constructed using different semantic domains than person terms. This study found that the interaction between phonological properties and semantic domains is prevalent in signed kinship terminology. Signed kinship terminologies are organized by formal and semantic properties, informed by possible morphological markings drawn from the domain of kinship terminologies in signed languages.

Initialization, Fingerspelling, and Character Representation in Signed Kinship

Terminology

Initialization in Kin Terms

Initialization productively forms a relatively large number of kin terms across the signed languages under study. Initialization is an invented system to represent the first letter of the written equivalent form in the respective surrounding spoken language. Due to close interaction with spoken/written languages, signed languages have devised strategies to represent written forms in a visual mode—and one such strategy is presented by initialization.

The formal expression of an initialized handshape appears in different types of formations. Brentari and Padden (2001) described two types of initialized signs. The first type depicts an initialized handshape overlapped to a basic sign. The second type involves signs overlapped with initialized handshapes, but without basic counterparts. This study revealed another type of initialization where the initialized handshape is

realized in the neutral space with no path movement and the location itself is not semantically motivated.

An initialized sign manifests a manual representation of a letter that corresponds to the first letter of a written translation.⁴⁸ The French form for FRERE ‘brother’ overlaps with an initialized handshape of ‘F’ by an alphabetic manual system prescribed by LSF alphabet. Nepali term for *husband’s sister* conveys an initialized handshape of ‘DA’; motivated by the written Nepali term *dewaraani*. Chinese expresses a pinyin representation of ‘S’ to denote SUNZI ‘grandson’. These signed languages’ manual systems are not identical in form or not refer to the same written letter representation, but instead refer to language-specific manual systems.

Some kin terms are discriminated by an initialized handshape as these forms share a similar semantic domain. The American set of collateral terms overlap with an initialized handshape. For example, the American sign for *aunt* overlaps with an ‘A’ handshape, while *niece* overlaps with a ‘N’ handshape. There is no basic form that expresses the semantic property of *female collateral relations* as there is no lexical entry of a non-initialized form reported in the American Sign Language dictionary. It is possible that some initialized kin terms may be derived from a generic (base-level) signed

⁴⁸ Signed languages represent a letter of the written form in different types of manual systems: alphabetic, Cyrillic, Devanagari, Pinyin, and others. The manual representations of initialized handshapes are not identical across signed languages as they are language-specific. It is still unknown if all signed languages contain a manual system to visually represent written forms.

form, but understanding this would require more in-depth investigation into the sign formation of the lexicon of individual signed languages than can be accomplished in the scope of this study.

Some initialized forms express two-lexeme constructions; including one form that is an initialized handshape. For example, the set of American affinal terms is constructed of two lexical signs. In the affinal construction, the first lexical sign is a nuclear kin term while the second sign realizes *law* that overlaps with an initialized handshape of ‘L’. For instance, the American term of *brother-in-law* produces as [brother] [law].⁴⁹ Evidence found in this study demonstrates that the presence of the initialized handshape in kin terms indicates motivation by manually representing the first letter of the written form of their surrounding linguistic communities.

Data includes all kin terms expressed by an initialized handshape. Appendix F Table F15 described the distribution of initialization manifested in kin terms across 40 signed languages.

The distribution of initialization manifested in kin terms revealed that 25 signed languages exploited initialized handshapes to construct kin terms. The percentage of initialization in kin terms ranged from 0% to 93.8%. The highest reported set of

⁴⁹ The American construction reveals a possible motivation by the written English morphosyntactic construction of *brother-in-law*. The morphosyntactic analysis is beyond the scope of this current study but merits more investigation into the patterns of morphosyntactic constructions in signed kin terms.

initialization was Irish Sign Language with 93.8% of its kin terms. Sets of kin terms overlapped with initialized handshapes for at least 50% were identified in nine signed languages. These nine signed languages include: Irish, Mexican, Australian, Chinese, New Zealand, Thai, Ugandan, French, and Panamanian (ranked by highest to lowest by percentage). These signed languages demonstrate that the overlap of initialized handshape robustly produces kin terms.

The remaining 16 signed languages demonstrated an overlap with initialization ranging from 4.3% to 46.7% of kin terms. Out of 40 signed languages, 15 signed languages contained no overlap with initialized handshape in kin terms. Sets with no overlap of initialized handshape included: Afghan, Croatian, Finnish, Ho Chi Minh City, Hong Kong, IPSL-Bangalore, IPSL-Karachi, Israeli, Japanese, Korean, Persian, Namibian, Russian, Swedish, and Tibetan. Evidence in this study indicates that some signed languages utilize initialized handshapes to construct kin terms, while other signed languages show no evidence of overlap with initialized handshapes. It is unknown if signed languages that do not overlap with initialized handshapes avoid initialization in general. To determine avoidance seen in languages that do not use initialized handshape will require observation of formational patterns in their signed lexicon beyond the domain of kinship terminology. The range in percentage of initialization manifested in kin terms indicated variation across signed languages under study.

Evidence of pervasive exploitation of initialization in kin terms prompted a question regarding the role of initialized handshapes in kin terms. To further explore the distribution of initialized kin terms, these initialized terms were categorized by lineal,

collateral, and affinal kin relations. Excluded from the data are terms for *family*, *extended family*, and *relatives*.⁵⁰ The distribution exemplifies patterns of initialization in kin terms as shown in Appendix F Table F16.

The expression of initialized handshape appears to be motivated by the written translation equivalences from surrounding spoken/written linguistic communities. The mechanism of initialization in signed kin terms is designated to discriminate between kin referents. The distribution of initialized handshapes suggests language-specific patterns instead of cross-linguistic patterns. The distribution of initialization as a productive word-formation process cannot be generalized to all signed languages as 15 signed languages reported no initialized handshapes.

Kin Terms Realized by Fingerspelling and Character Representation

Signed languages showed that they construct kin terms by fingerspelling and character representation. The production of fingerspelling may be either expressed by one or two manual alphabetic systems, Danish's 'hand-mouth' system, or written character representations. The function of fingerspelling and character representation is to represent written forms in visual forms. Appendix F Table F17 illustrates the distribution of types of fingerspelling and character representations observed in signed kin terms.

Six of the signed languages under study produced kin terms by fingerspelling and character representation. Using one manual alphabetic system, American expresses terms

⁵⁰ Terms for *family*, *extended family*, and *relatives* total to 23 tokens in the whole data set of initialized handshape.

for *great grandfather* and *great grandmother* by fingerspelling G-R-E-A-T preceding the sign for *grandfather* or *grandmother*. While Brazilian fingerspells *grandfather* with one manual alphabetic system, Brazilian expresses *father* with a two componential construction of [*mustache*] [P-A-I ‘father’]. Australian employs the two manual alphabetic system to fingerspell *son*. Chinese forms two affinal terms of *husband’s father* and *elder sister’s husband* by written Chinese characters. Korean represents *uncle* and *cousin* by written Korean characters.

Danish expresses *father’s sister*, *nephew*, *niece*, and *brother-in-law* by a ‘mouth-hand’ system that synchronizes mouth movements with disambiguating handshapes (Brentari & Padden, 2001). Danish organizes kin terms into interesting types of word-formations. Danish constructs collateral and affinal terms by ‘hand-mouth’ fingerspelling while also using an overlap of one-manual alphabetic initialized handshapes to produce collateral terms for *aunt*, *uncle*, and *cousin-masculine*. The formal properties of the collateral kin terms created by initialization and ‘hand-mouth’ fingerspelling suggests a potential semantic organization specified by kin relations. A related issue involves the use of the ‘hand-mouth’ system and one-manual alphabetic systems in terms of markedness—are both systems equally marked or one is more marked than another? Examining the use of these systems in discourse would shed more light on their function in Danish Sign Language and better inform the potential competition between these two types of manual fingerspelling systems.

All fingerspelled terms do not refer to nuclear kin but instead refer to consanguineal, collateral, and affinal relations except for Australian’s term for *son*. A

small set of kin terms formed by fingerspelling and character representation provide evidence that suggests the use of fingerspelling and character representation denotes a marked category in signed kinship terminology.

Kin Types: Comparing Greenberg 1966's Universals of Kinship Terminology with Signed Data

Examination of kin types of signed languages requires revisiting the methodology of Greenberg's 1966 proposal of universals of spoken language kinship terminology. Consistent with Greenberg's methodology, the first analysis of this study involves types of parental kin terms, while the second analysis drills down to examine the variations of kin term types of the first generation ascending male terms: *father*, *father's brother*, and *mother's brother* in 40 signed languages. This examination of kin types of signed languages mirrored Greenberg's hypothesis of kin types of spoken/written languages. If Greenberg's hypothesis held true for signed language kin types, then the hypothesis of universality would be supported by this demonstration of modality-independence. In contrast, if analyses of signed kin types showed to be incongruent with Greenberg's hypothesis, then Greenberg's proposal was defined by modality-specific principles of spoken languages and not universal with respect to other modalities such as signed language.

Kin Types of Father and Mother in Signed Languages

The first typological analysis in this study involved the set of parental terms of *mother* and *father*. As Greenberg has found in his analysis, all spoken/written languages

contained two separate terms for *mother* and *father*; affirming classification as Type 1. The types defined by Greenberg (1966) included:

Type 1: Two separate terms to denote father and mother

Type 2: One term to denote father and mother

Signed forms of mother and father across 40 signed languages were examined by their phonological structure. Phonological structure of parental terms determined if the language-specific parental terms express mother and father by either one term or by distinct forms. Testing Greenberg's hypothesis that all signed languages under investigation satisfy the criteria for Type 1, and whether signed languages expressed mother and father by separate terms or one term is reflected in Appendix F Table F18.

Except for IPSL-Bangalore, all signed languages meet the Type 1 criteria, supporting Greenberg's hypothesis that all languages (spoken and signed) expressed two separate forms for *father* and *mother*. IPSL-Bangalore was typed as *unknown* as there was no lexical entry for *father*; and not known if the omission of this term in the signed language book accurately reflects the use of a father term in practice. Therefore, determining what type IPSL-Bangalore is remains inconclusive at this time. This finding supports Greenberg's claim that all other languages studied use two separate forms for *father* and *mother*. Furthermore, the evidence of two separate forms for parental terms in the current data counter Woodward's 1973 analysis; finding that six out of twenty language varieties did not express two separate forms for parental terms.

How signed languages realize *parents* were examined for emerging patterns that posed some interest. Out of 40 signed languages, 22 expressed *parents* with both terms of

father and *mother*. Combining parental terms to form *parents* were motivated by two sets of constructions: juxtaposition and compounding.

The first type of construction involved juxtaposition by expressing two lexemes adjacent to each other. Neither lexeme showed any modification by morphological attachments or alternations. The juxtaposed construction of *parents* may order parental terms either as [*father*] [*mother*] or [*mother*] [*father*]; preserving the phonological form of both constituents of *father* and *mother*. Four signed languages that form *parents* by juxtaposition included IPSL-Karachi, Mexican, and one lexical variant of Dutch, where the order is prescribed as *father* preceding *mother* as [*father*][*mother*]. Bulgarian sequentially constructs *parents* with three lexical forms of [*father*] [*mother*] [*giving-birth*].

As demonstrated, juxtaposition was one strategy used to construct kin terms in a few signed languages. The underlying motivation of juxtaposed word order for *parents* may be determined by language-specific syntactic patterns. In some cases discourse factors affect phonological processing by assimilation and/or anticipation of the signs that precede and/or follow the term for *parents*. Closer examination of real-time naturalistic data would be required to determine how these constructions of *parents* were phonologically realized.

14 signed languages realize *parents* as a compound of both constituents of *father* and *mother*; preserving some formal elements of *father* and *mother*. Seven signed languages position *mother* initially in the construction followed by *father* in the final position. These languages include: Afghan, American, Australian, Danish, Italian, New

Zealand, and Norwegian. In contrast, the word order of *father* preceding *mother* was seen in seven languages including: Dutch, Finnish, Hong Kong, Irish, Israeli, Quebec, and Swedish. Some of these compounds for *parents* demonstrate phonological reduction in movement between both forms while preserving handshape and location; and shortening movements of citation in forms of *father* and *mother*. One of the limitations of this study is that while phonological reduction of movement could be clearly seen in video-based dictionary entries where movement was shortened between two lexical forms of *father* and *mother*, this relationship could not be seen in print-based dictionary entries that did not clearly convey potential internal changes of compounding processes.

In signed languages that compound terms for *father* and *mother* to form *parents*, the signs undergo internal changes and convey different formal properties. The most prevalent formational changes in compound forms of *parents* can be characterized as: movement reduction of citation forms of *father* and *mother*, transitional movement in between both parental terms, and monosyllabic. For instance, the French compound of *parents* illustrates reduction in movement, but also a change in initial handshape position in the term for *father*. This compound form clearly experienced lexicalization by reducing a disyllabic movement to monosyllabic forms.⁵¹ One lexical variant of *parents*

⁵¹ In French, the formal property of handshape in *father* is produced with bent index and thumb by intervals of contacts between index finger and thumb. As for *parents*, the handshape was a closed fist and was not phonologically assimilated by the handshape of an index finger in *mother*. The motivation of handshape change in the initial position of *parents* may be due to phonological economy—to become more convenient in terms of ease and fluidity.

in Dutch overlaps only by handshape and location in the initial position of the first constituent of *father*, then realized the full form for *mother* in the second component of the monosyllabic compound construction. These types of phonological changes in the compounded form of *parents* corroborate the descriptions of the compounding process in signed languages (Klima & Bellugi, 1979; Johnston & Schembri, 2007).

British, Australian, and New Zealand Sign Languages combine two-manual alphabetic representations of ‘M’ and ‘F’ to produce *parents*. In the form for *parents*, movements of the manual alphabetic representation were reduced from two to one, and a transitional movement in between ‘M’ and ‘F’ was added—a phonological process known as *movement epenthesis* (Johnston & Schembri, 2007).

Within the set of compounds, forms illustrate handshape change by assimilation and/or anticipation of handshape of the second sign from the first sign. These compounded forms demonstrate that movement was the most likely phonological feature to experience internal change. Handshape is the next phonological feature to undergo internal change. While handshape and movement transform into compounded forms of *parents*, location is retained in older forms of *father* and *mother*, a phenomena observed across all signed languages under study.

Japanese and Korean signs for *father* and *mother* form by combining two units into a lexicalized unit: [*blood relation* + gender marking]. These signs are produced with either the thumb to mark masculine or the pinky finger to mark feminine. Similar to the construction of parental terms, Japanese and Korean signs construct *parents* with the selected fingers of thumb and pinky finger; encompassing both masculine and feminine

markings as [*blood relation* + male and female markings]. This compounding process encompasses both masculine and feminine markings into a lexicalized form modifying handshake in the final position of construction. This compounded form preserves the initial form of *blood relation* in Japanese and Korean Sign Languages.

The Namibian sign for *parents* overlaps in handshake and movement with both *father* and *mother*; but is differentiated by location. With a stative movement, *father* situates on the ipsilateral chest, while *mother* locates on the contralateral chest with the dominant hand wrapping over the non-dominant's fist. The location of *parents* realizes centrally on the chest with no movement. The motivation of the central location conveys an equilibrium that neutralizes the locations of both parental terms. The Namibian example differs from other signed languages examined in this study where compounds typically were produced from two distinct forms that underwent formational changes. Based on signed language data studied, compounding is a very productive morphological process in forming *parent* terms.

Instead of constructing *parents* by either juxtaposition or compounding, six signed languages produced a distinct form of *parents* with no phonological overlap with parental terms. Argentinean and Tanzanian signed languages construct *parents* with an initialized handshake; motivated by structural mapping of the first letter of orthographic forms by the written languages of their communities. The German sign for *parents* appears to be semantically overlapped with the sign of *marry* as the German's term of *parents* is identical to the form for *marry*. The Russian term for *parents* does not derive from either forms of *father* and *mother*, but instead expresses *parents* as a distinct form of

two index fingers alternatively striking each other in neutral space. The distinct form of Russian *parents* maps to a different semantic domain. These findings show that signed languages construct *parents* by different semantic domains other than the juxtapositioning and compounding of *father* and *mother*.

The prevalent strategy expressing the semantic concept of *parents* is formed by combining terms in signed languages. Compounding is the most productive strategy in constructing *parents* in signed languages, while juxtaposition is another strategy that is realized by the order of adjacency of both parental forms and preserves full formal properties of parental terms. Juxtaposition of *father* and *mother* may lead to a compound form as both parental terms may undergo lexicalization by internal changes of movement reduction and possibly handshape change.

Kin Types of Father, Father's Brother, and Mother's Brother in Signed Languages

The second typology under study concerns kinship systems classified by parental and parents' sibling terms. Greenberg described four types of kinship terminology for the set of first ascending generation males as: *father*, *father's brother*, and *mother's brother*. These four relationships can be categorized as generational, lineal, bifurcate collateral, and bifurcate merging types (1966, pp. 83-84). Each type defined by Greenberg:

Type 1 (generational type): All three of these relatives are referred to by the same term.

Type 2 (lineal type): The father is distinguished from the two collateral relatives, which are merged in a single uncle term.

Type 3 (bifurcate collateral type): All three terms are designated by separate terms.

Type 4 (bifurcate merging type): The paternal line relatives, father and father's brother, share the same term, while a second term is used for the mother's brother.

Type 5 (unknown): The father and mother's brother are designated by the same kin term, while the father's brother is given a separate kin term.

For 40 signed languages in the study, kinship typology of first generation ascending males yielded a variety of type classifications. See Appendix F Table F19.

Language sampling revealed that signed languages construct terms of *father*, *father's brother*, and *father's brother* by different types. Of the 40 signed languages studied, 25 predominantly located in European and Americas regions can be categorized as lineal. The 9 signed languages of predominately Central Asian and the Middle East categorize as a bifurcate collateral type (Type 3), while Tanzanian Signed Language is the only one example in this study of bifurcate merging (Type 4). No signed languages in this study could be typed as generational (Type 1). Due to insufficient data for collateral terms for *uncle*, five signed languages had to be classified as unknown. Even with a small language sampling of 40 signed languages, the pattern of kin types of *father*, *father's brother*, and *mother's brother* demonstrates typological variation among signed languages as discussed in the following descriptions.

Type 1: generational. No signed language under study used only one term for father, father's brother, and mother's brother. No signed languages in the small language sampling under study could be typed as generational, and the viability of the generational type could not be established.

Type 2: lineal. The lineal type emerged as the predominant type of all signed languages studied. Languages included: all Americas (North, Central, and South), European (except for Swedish), Austronesian (Australian and New Zealand), Kenyan, Ugandan, and Japanese. These languages produce father as a distinct form compared to conceptual representations of father's brother and which conflate into one kin term denoting uncle by no specific relationship to paternal or maternal lineage.

Except for Kenyan and one lexical variant of Japanese, other languages express the collateral term for *uncle* as a holistic form with no differentiation with respect to other relations except for collateral relation. Kenyan constructs *uncle* with a lexical unit for *father* and another term referring to collateral relation, as observed in *aunt*. Japanese also realize *uncle* with masculine marking following the form for *relatives*. In contrast 7 out of 25 languages lexically extend the kin term of *uncle* to *aunt*; indicating no distinction in gender along with patrilineal or matrilineal relations in ascending collateral terms.

Lineal type dominates all languages from Europe and the Americas along with the signed languages of Kenya, Uganda, and Japan.

Type 3: bifurcate collateral. Nine signed languages produced distinct forms for all three kin referents of father, father's brother, and mother's brother. These languages include: Afghan, Chinese, Ho Chi Minh City, IPSL-Karachi, Nepali, Turkish, Thai; all

languages that originated in Asia. The only non-Asian language typed as bifurcate collateral was Swedish.

While most languages express distinct forms of the three kin referents, IPSL-Karachi, Nepali, and Chinese produced male ascending collateral terms by two lexical units. IPSL-Karachi and Nepali map to *man* constructed with another form that specifies not only paternal and maternal relations, but also consanguineal and affinal relations. Furthermore, relative age was also differentiated in Nepali; illustrating more distinctions with respect to male ascending collateral terms. Similar to Nepali in terms of distinctions in male ascending collateral terms, Chinese discriminates by paternal and maternal relations, consanguineal and affinal relations, and specified relative age in paternal male ascending collateral kin terms. Instead of using *man*, Chinese expresses the constituent of *father* to form male ascending collateral terms.

Unlike other languages typed as bifurcate collateral, Swedish did not contain a distinct term for *mother's brother*. Swedish produces one kin term denoting *father's brother* along with another gender-neutral term that refers to ascending collateral kin (*father's brother, father's sister, mother's brother, mother's sister*). While Swedish contains a kin term specifying *father's brother*, there is no distinct form referring to *mother's brother*, which may disqualify it from being classified as a purely bifurcate collateral type.

The bifurcate collateral type predominately classifies the signed languages of Central Asia, South East Asia, along with China and Turkey.

Type 4: bifurcate merging. Tanzanian was the only signed language categorized as bifurcate merging type (Type 4). Tanzanian forms construct parental uncle identically to father with a sequential component of younger or older preceding the component of father. The form for father also expresses man; indicating semantic extension of man to father, and as well for paternal uncle. Maternal uncle does not share overlapping phonological aspects with paternal uncle and/or man. Tanzanian is categorized typologically as bifurcate merging with respect to parents and parents' siblings terms.

Signed languages under study classify as more than one language type in the domain of first generation ascending male kin types of *father*, *father's brother*, and *mother's brother*. Greenberg observed similar differentiation in female counterparts for *mother*, *mother's sister*, and *father's sister* (1966). However, analysis of first generation ascending female terms have not been undertaken with the current data (Greenberg, 1966). Attested types were *lineal*, *bifurcate collateral*, and *bifurcate merging*, while *generational* remained unattested in the classificatory systems of signed languages' kinship terminology in this study.

This typological study of 40 signed languages demonstrate salient linguistic structures that reflect their culturally-bounded kinship systems. All but one signed language was found to have distinct parental terms for *mother* and *father*.⁵² While no generational types of first generation ascending male kin were evident in this study, lineal type was the predominant classification of the signed languages of Europe and the

⁵² IPSL-Bangalore was typed as unknown as there was no lexical entry for *father*.

Americas along with the signed languages of Kenya, Uganda, and Japan. The bifurcate collateral type predominately classifies the signed languages of Central Asia, South East Asia, China, and Turkey. Only Tanzanian could be categorized as a bifurcate emerging type.

Summary

Typological studies of signed languages introduce a different perspective to signed language linguistics. This study investigates underlying assumptions of the classification of language types in signed languages by exploring the relationship between linguistic form and function in kinship terminology. This study compares a large sampling of geographically diverse signed languages in search of linguistic patterns that cut across signed languages. Signed language typology provides rational for how linguistic processes are exploited based on the properties of modality-dependent, modality-independent, and language-specific domains.

Exploring structural complexity in kin terms reveals how the interaction of iconicity and arbitrariness motivates linguistic patterns, and contributes to understanding differentiating phonology and morphology in signed lexicon. Examining the nature of the relationship between phonological structure and semantic domains grounds the opportunity to seek generalizations that emerge from individual signed languages and cross-linguistically. The scaffolding of identified language generalizations provides insight into how the classification of language in signed languages maybe interpreted as language types; the patterns identified are consistent with the definitions proposed by Greenberg's universals of kinship terminology.

CHAPTER 5: CONCLUSION

This chapter concludes this investigation of the implications of kinship terminology on the typology of signed languages with a discussion of the findings of this study. The purpose of this research involved the discovery of typological patterns and generalizations that may be posited for signed languages. The methods employed in this study included the systematic examination of the phonology, morphology, and semantic derivation of 40 signed languages representing the world's macro-geographic regions. The challenges and limitations inherent in conducting a typological study of signed languages also merit a final discussion, along with recommendations for future related research.

This study explored kinship terminology by examining patterns of formal properties and semantics exemplifying the relationship of form-function mappings in signed kin terms. A language sampling of 40 signed languages with available dictionary sources were selected to investigate how kin terms in signed languages express familial relationships as classificatory systems. Signed languages from the Americas, Europe, Asia, and Africa provided a diverse sample representing geographically diverse macro-regions of the world. Drawing from signed language dictionaries afforded the opportunity to explore typological patterns generalized across signed languages. This study of the language typology of kinship terminology in signed languages examined theoretical and methodological issues regarding the lexical-semantic analysis of signed languages.

Evidence of Language Variation across Signed Languages

Language variation is expressed by differences in kin terms; demonstrated by word length, formational expression (semantic extension, semantic derivation, and phonologically distinct forms). While an overview indicated a trend of forming kin terms based on phonological realization of one or two signs, signed languages construct kin terms by different strategies. Based on phonological analysis, kin terms are created by semantic extension, semantic derivation, and phonologically distinct forms. Emerging evidence of the typological variation of signed kin terms reveals a variety of formational properties, constructions, and conceptualizations expressed across signed languages.

The Nature of Markedness in Signed Language Kinship Terminology

Greenberg's proposal of *Universals of Kinship Terminology* applied to signed languages required contemplating the nature of markedness in signed language kinship terminology. A paucity of knowledge of the nature of markedness in signed languages currently exists. This study provides clues about the criteria of markedness with respect to *word length* and *initialization* of kinship terminology in signed languages.

Word Length of Kin Terms

The distribution of lexical counts across signed languages demonstrates a gradient scale of lexical counts; representing patterns of word length in kin terms. Word length in many signed languages studied was typically expressed by one lexical unit while a minority of languages realized kin terms using two or more lexical units. The distribution of word length relates to the identification of unmarked and marked kin terms. The first step in the categorization of unmarked and marked kin terms required examination of

each individual signed language's distribution of lexical counts conveyed by their set of kin terms. Lexical counts realized by the majority of kin terms defined the unmarked category. The marked category consistently contained at least one lexical unit more than what was found in the lexical count of the unmarked category in each signed language with markings.

Defining unmarked and marked kin terms by word length is relative; manifested in the distribution of lexical counts of each signed language. For instance, Argentinean contains 14 kin terms formed by one lexical sign while five kin terms construct using two lexical signs. This language-specific distribution suggests that the set of two lexical units is more marked than the unmarked set of terms with one lexical unit. Extending this phenomenon, terms containing two lexemes were found to be unmarked in comparison to the marked category defined by sets containing three or more lexical units. Examination of the distribution of word length revealed that most signed languages of Central Asia productively form kin terms using not one, but two lexical units. A similar pattern was observed in Chinese and Japanese Sign Language. For example, the unmarked kin terms of IPSL-Karachi are realized using two lexical units (E.g. *wife* [*female*] [*marry*] while terms of three and four lexical units are marked (E.g. *sister's son (nephew)*: [*female*] [*sibling*] [*male*] [*child*]).

The distribution of lexical unit counts in this study was found to indicate patterns of structural complexity in kinship terminology. The count of lexical units of the set of languages containing the most kin terms became the baseline used to determine structural complexity related to unmarked and marked categories. Within an individual signed

language, kin terms expressing more lexical units than the baseline of the language-specific distribution of lexical count were found to be marked. The relative measurement of the distribution of lexical count may be considered one of the strategies used to determine structural complexity and markedness in signed languages.

Role of Initialization in Kin Terms: Derivational Morphology Define Categories as Marked or Unmarked

This study showed variation in employing initialization in signed language kin terms. The distribution of initialization ranged from no evidence of initialization to overlapped initialized handshapes seen in over 50% of kin terms in language-specific sets. The expression of initialization revealed paradigmatic patterns in constructions of kin terms; generalizing a probabilistic pattern of initialization to form collateral and affinal terms. In contrast, a few signed languages robustly produce most kin terms with initialized handshapes (e.g. Irish Sign Language formed 15 kin terms out of 16 kin terms with an initialization overlap). As a result, the distribution of initialization in the signed kin terminologies studied indicated typological variation across signed languages.

Brentari and Padden (2001) found that in American Sign Language, one of the most productive word-formation processes is initialization.⁵³ Furthermore, they argued that initialization is a non-native (or foreign) element in American signed lexicon. While initialized handshapes are not manifested in American lineal kin terms, American

⁵³ Brentari and Padden (2001) postulated that the employment of initialization is to specify technical or professional purposes due to the educational mobilization of the American Deaf population.

collateral terms overlap with initialized handshapes, supporting this pattern. Based on formal descriptions of American kin terms, American collateral terms are marked as compared to American lineal terms that remain unmarked.

Brentari and Padden argue that the overlap of an initialized handshape suggests phonological markedness within the domain of signed kinship terminology. In some signed languages, some kin terms overlap with initialized handshapes indicating markedness, while other kin terms without initialized handshape remain unmarked. As evidenced in Nepali kin terms, collateral and affinal terms contain initialized handshapes, while lineal terms do not overlap with initialized handshapes. This phenomenon is apparent in other signed languages with sets productively formed by initialization.

While the manifestation of initialization may establish a phonological marked property and some signed languages robustly produce kin terms by initialization, the proposition that initialization denotes markedness does not hold true in all signed languages. Due to its intermittent occurrence across signed languages, initialization cannot be defined as a marked category by default as it lacks consistency. For example, British kin terms overlap with initialized handshapes in the lineal terms *mother*, *father*, *grandmother*, *daughter* compared to no initialization manifested in *son*, *sister* and *brother* and the collateral set of *aunt*, *uncle*, *niece*, and *nephew*.⁵⁴ Upholding Brentari and Padden's proposition, the British lineal set is a marked category contrary to other

⁵⁴ The British form for *aunt*, *uncle*, *niece*, and *nephew* is polysemous. British signers discriminate kin relations by mouthing while they sign the collateral term of *aunt*, *uncle*, *niece*, and *nephew*.

unmarked kin terms without initialized handshape. However, this analysis of markedness confounds Greenberg's proposition that terms for *mother* and *father* are always unmarked compared to any other kin terms.

Instead of viewing initialization as a default formal property used to define markedness, kin terms' semantic property was found to be a better determinant to conclude markedness. Reverting to the British example, lineal and collateral terms could be categorized as unmarked and marked by semantics rather than phonological description. The semantic property of the British lineal term for *daughter* specifies a female offspring although the formal property is conveyed by overlap of an initialized 'D'. In contrast, the collateral form conflates kin referents of *aunt*, *uncle*, *niece*, and *nephew* with a form that contains no overlap of an initialized handshape. Kin terms' encoded semantics provide a clearer description for determining markedness in signed kin terms. For example, all British lineal terms overlap with an initialized handshape except for *boy*; however, *boy* is phonologically derived from the form of *man*. Concluding from this, initialization in British lineal terms is not necessarily phonologically marked, but instead represents one type of the morphological processes that form signs in British Sign Language. Thus, the distribution of initialization in signed kin terms requires further examination into each individual language's word-formation process before determining if initialization can be considered to be a manifestation of typological markedness in signed kin terms. Defining unmarked and marked categories by initialization should be considered relative to the basis of each individual signed language, rather than generalizing initialization as a marked category in all signed

languages. While typological markedness is a language universal, preliminary findings suggest that initialization may not be an indicator of typological markedness and merits additional investigation of word formation in signed languages' lexicon.

Evidence found in this study suggests that initialization in kin terms functions as a mechanism to differentiate kin relationships in some signed languages. The grammatical category of kin terms known as nominals raises another relevant question concerning the typology of signed languages. Grammatical categories in signed languages remain poorly understood. However, some literature proposes that signed languages are verbal-dominant languages (Arnoff *et al*, 2003, Hoiting & Slobin, 2001). Taking the position that signed languages are generally described as verbal-dominant languages, leads to the speculative conjecture that sets of nominals in signed languages may be smaller than verbal constructions. Due to the paucity of descriptions of grammatical categories such as nominals, inadequate understanding of grammatical categories in signed languages persists. This study provides insight into how nominals are produced cross-linguistically. Findings of this study suggest that signed languages form a nominal category of kin terms through different morphological processes, such as initialization, than that seen in verbal constructions. This line of inquiry merits further research. No conclusion concerning grammatical categories can be determined until more has been studied and is understood about the criteria defining grammatical categories in signed languages.

The nature of initialization in kin terms raises an important socio-anthropological question with respect to the socio-cultural pressures of respective kinship systems to devise kin terms that are congruent (or near-congruent) to spoken languages' kin terms.

The prevalent evidence of initialization in signed kin terms suggests that signed languages responded to socio-cultural pressures defined by surrounding spoken/written kinship terminology as evidenced in their kinship systems. Finding congruence between signed and spoken/written kin terms merits in-depth analysis to better inform the motivation exploiting initialized handshapes in signed kin terms.

Findings of this study revealed a surprisingly productive role played by initialized handshapes in the domain of kin terms. Gaining further insight into the manifestation of initialized handshapes in signed languages would require going outside of the domain of kinship terminology to examine the role of initialized handshapes in the larger lexicon of signed language with respect to markedness. Further study is required to gain a better understanding of the role initialized handshapes play in each signed language and to compare patterns across signed languages before drawing generalizations concerning the role of initialization in signed kin terms.

Analysis of Semantic Extension in Signed Kin Terms

Semantic Extension: Polysemy, Homonymy, and the Overlap of Mouthing Component

This study revealed some evidence of semantic extension in signed kinship terminologies. One key question concerning semantically extended forms is whether they can be classified as polysemous or homonymous. Polysemy is defined as a word with multiple related meanings, while homonymy refers to a word that encodes different but unrelated meanings (e.g. English *trunk* which may refer to *a storage chest* or *a part of elephant*). Johnson and Schembri (2007) describe that polysemy occurs when multiple related meanings are conveyed in an identical phonological form (of a sign). For instance,

the meanings of *road*, *street*, *way*, and *method* are expressed by the same Australian sign; illustrating that lexical extension of a signed form drives polysemy.⁵⁵

In contrast, Boyes Braem (2001) argued that a sign of an identical manual expression is defined as homonymy, as the sign requires a mouthing component to specify its meaning. Boyes Braem described an example of homonymy of *same*, *brother*, *sister* in Swiss German Sign Language.⁵⁶ To express *brother* or *sister*, Swiss German signers would simultaneously form the manual sign of *same* while mouthing the spoken German forms of *brother* or *sister*.⁵⁷ The definition of a mouthing component is an unvoiced pronunciation resembling a spoken form manifested on the speaker's lips (Boyes Braem, 2001). While the function of the German mouthing component is to discriminate between the genders of sibling referents, Boyes Braem found that the German mouthing components are obligatory in certain signs to avoid homonyms in Swiss German Sign Language. Mouthing components produced simultaneously with manual nominal constructions also function in establishing a linguistic reference in signed Swiss German discourse. In turn, Swiss German signers evolved a strategy to

⁵⁵ Johnston and Schembri (2007) did not discuss whether signed polysemous forms and homonyms produce signed manual forms simultaneously with mouthing components, whereas the function of the mouthing component is to disambiguate by specifying an explicit meaning.

⁵⁶ Swiss German Sign Language is the signed language used in the deaf community in the German-speaking region in Switzerland (Boyes Braem, 2001).

⁵⁷ The German mouthing components are realized as *gleich* 'same', *bruder* 'brother', and *schwester* 'sister'.

avoid homonymy by expressing mouthing components overlapped by similar meanings in spoken German terms while producing the identical manual form in order to specify referents.

Boyes Braem's finding is corroborated with another study of Australian Sign Language where mouthing components typically occur with nominals rather than in verbal constructions. However, mouthing components may be optional when there is no chance of potential misunderstanding of the meaning during Auslan discourse (Schembri, Wigglesworth, Johnston, Adam, & Barker, 2000).

This study reports possible evidence of polysemy or homonymy in kin terms semantically extended from person terms. For instance, the semantic extension of person terms to parental terms (which may apply to other kin terms as well, E.g. Tanzanian) exemplifies possible polysemy or homonymy. However, it remains unclear if these semantic extensions are *de facto* polysemous encoding multiple semantic related references, or if the kin term conflates kin referents into one category determined by their kinship system.⁵⁸ For instance, as the Tanzanian dictionary was a print-based source, the analysis of semantic extension only focused on manual representation with no opportunity to access their expression of mouthing components. As some dictionaries were print-based sources, mouthing components were not well represented in their lexical entries. Another possibility is that mouthing components influenced by surrounding

⁵⁸ I thank Karen Naughton for bringing this point to my attention.

spoken languages may not be a linguistically integral component of their signed language systems.

The role of mouthing in kin terms merits further investigation as it begs one important question—if a form encompasses more than one kin referent and is discriminated by an overlap of spoken language’s mouthing component, then should this type of expression be considered as polysemy or homonymy? Another possibility takes the view that mouthing component functions as a derivational morpheme used to specify meaning. This supports a description of monosemy. An identical manual realization along with a specified mouthing component conveys a distinct form that encodes no semantic ambiguity. To examine the function of mouthing component as derivational would require a large corpora to examine whether the mouthing component is obligatory along with the manual expression or whether it is optional. This attribute of mouthing components is clearly illustrated in video-based dictionaries.

Another example drawn from a video-based dictionary involved the Norwegian kin terms of *sister*, *brother*, and *collateral relations*. Norwegian Sign Language constructs a sibling term encompassing both conceptual kin relations of *brother* and *sister* by one form. However, gender is discriminated by a mouthing component, overlapped with spoken Norwegian forms. Again, only one signed Norwegian collateral term is used to refer *uncle*, *aunt*, *cousin-masculine*, *cousin-feminine*, *nephew*, and *niece*; illustrating possible polysemy or homonymy as the form incorporates multiple kin referents. A mouthing component plays a role in differentiating gender, ascending and descending collateral kin relations by overlapping spoken Norwegian forms of *onkel* ‘uncle’, *tante*

‘aunt’, *fetter* ‘cousin-masculine’, *kusine* ‘cousin-feminine’, *nevø* ‘nephew’, and *niese* ‘niece’.

To determine if Norwegian’s kin terms of *sister/brother* and *collateral relations* are polysemous or homonymous, analysis is based on the use of mouthing component. If Norwegian signers consistently integrate the mouthing component of specific kin referents in all expressions of the same form (e.g. *collateral relations*), then homonymy would be an appropriate way to describe this attribute. However, if mouthing component appears to be optional, either by expressing or not expressing the mouthing overlap of spoken Norwegian form, then polysemy would be a better description. Another consideration would be taking in the possibility that mouthing functions as derivational (Croft, personal communication). At this point, whether the pattern of usage of kin term in Norwegian is homonyms or polysemous cannot be concluded without further investigation of the naturalistic context of signing.

One methodological issue arose concerning differences in dictionary sources. The comparison of video-based dictionaries with print-based dictionaries differed by the encoding of kin terms. Video-based dictionaries clearly incorporated mouthing components overlapped with manual forms while print-based dictionaries did not incorporate the description of mouthing component, raising challenges in determining if mouthing components are integral to the expression of kin terms.

Some signed languages may not incorporate mouthing components shaped by surrounding spoken languages (e.g. Afghan, personal observation), resulting in possible typological variation distinguished by mouthing components. A signed form is not simply

a manual expression, but instead incorporates both manual and non-manual expressions (e.g. hands, mouthing component, etc). The function of mouthing components merits further investigation to examine generalizations that may be drawn regarding them in signed kin terms. Furthermore, the nature of polysemy and homonymy in signed languages continues to be underinvestigated. Future analyses must include mouthing components to determine whether signs with identical “manual” realizations encoded representing different meanings are polysemous or homonyms. As more light is shed to differentiate polysemy, homonymy, or monosemy (a distinct form with mouthing as a derivational morpheme) evidenced in kin terms formed by semantic extension, polysemy, homonymy, and monosemy emerge as grammatical categories of nominals across signed languages.

Folk Etymologies in Person Terms of Man and Woman: An Interesting Piece of the Puzzle

Folk etymologies in person terms of *man* and *woman* present an interesting piece of the puzzle concerning word formation in kin terms. Did signed forms originate from the same historical source (e.g. language borrowing, genetic relationship)? Was it a coincidence that the same image schema is expressed across different signed languages or is it coincidence that the realization of identical forms distinctly emerge across signed languages motivated by different image schemas? If forms overlap to the same image schema, then what symbolism drives the similarity in the forms, for example *man* and *woman*, manifested across signed languages?

The form for *man* etymologized by *tipping men's hat* was observed in nine signed languages. Since the form *tipping men's hat* is specified by the geographical regions of Northern Europe, the US, and Canada, this finding suggested that a cultural-specific framework motivates the form *tipping men's hat*. The cultural framework shared among people of Northern Europe may account for three possible factors leading to the formation of *tipping men's hat*. However, geographic proximity cannot account for Canada and the United States. A second factor, such as language borrowed from Northern European signed languages, may account *tipping men's hat* in American and Quebec Sign Language. However, language borrowing would not be a good explanation for American and Quebec Sign Language as these languages are not known to be genetically related to signed languages in Northern Europe.⁵⁹

The third factor may emanate from a possible genetic (historical) relationship. However, concluding a historical relationship requires further investigation to establish historical accounts of signed languages.⁶⁰ One exception involves comparison of

⁵⁹ While American Sign Language is known to be related to French Sign Language, there is, insofar, no known direct evidence to claim that American Sign Language is genetically related to e.g. German Sign Language and Swedish Sign Language whereas these languages are from Northern Europe.

⁶⁰ Another challenge with respect to genetic relationship leads to speculation that to determine the potential comparative relationship of one signed language requires communication through other signed languages. Rather than speculate about possible genetic relationships of signed languages based on geography and spoken/written languages, an historical analysis was considered outside the scope of this investigation to be addressed by future research undertaken by historical experts.

American and French forms for *man* as these signed languages are historically related, yet the American form for *man* maps to the concept of *tipping men's hat*, while the French form for *man* expresses the metonymic concept of *mustache*. The different metonymic representations of *man* illustrated in American and French forms provide an interesting clue to the larger puzzle involving factors of historical relationship, language borrowing, and language/cultural-specific frameworks in signed languages.

In contrast to the sign for *man*, the sign for *woman* as etymologized by *bonnet strings*, *woman's soft cheek*, or *hair curls on woman's cheek* was formed in two unrelated signed languages of British and Mexican among other related and unrelated signed languages.⁶¹ Of particular interest the most common form for *woman* shares the same location on the lower or cheek in 15 out of 40 signed languages. It remains unclear if all these forms for *woman* originated from the same image schema or from different schema. Examination of folk etymologies within this set would be needed to provide clues about the formation of *woman*. Historical documents verifying the etymological source of *woman* were not found and are outside the scope of this investigation.

⁶¹ Jolly and O'Kelly (1980) argued that American terms for *man* and *woman* are not etymologized by *tipping men's hat* and *bonnet strings*, but instead demonstrate the cultural view that men are superior to women. Their argument ignored the likely fact that American *man* and *woman* were formed by compounding of a person term with another lexical unit. Taking the position that compounding drove the formation of American terms *man* and *woman*, these terms clearly have undergone lexicalization by losing more transparent elements of compound forms.

Examination of etymologized forms of *man* and *woman* revealed interesting clues to word formation in signed languages. These findings demonstrated forms for *man* and *woman* were possibly once motivated by cultural-specific properties reflecting salient characteristics attributed to men and women. While the etymologized form for *man* is confined to the geography of Northern Europe, USA, and Canada, the form of *woman* conventionally etymologized as *bonnet strings* and *soft cheek* is surprisingly not geographically constrained, but instead found in different parts of the world. These characteristics of *tipping men's hat* and *bonnet strings* do not reflect 21st century descriptions of men and women in the West as these attributions reflect historical-cultural descriptions of male decorum and female propensity to wear bonnets during the 18th century. One factor contributing to the maintenance of these etymologized forms may be accounted for by token frequency as the terms for *man* and *woman* are clearly used with high frequency in signed language discourse. High frequent forms are most likely to resist internal phonological and morphological changes as discussed in studies in spoken languages (Bybee, 2001). In turn, folk etymologies of *man* and *woman* provide interesting insights into the types of strategies employed in the word formation of signed languages.

Interaction of Phonology and Semantics in Signed Kinship Terminology

This section discusses the patterns that arise from the interaction of phonology and semantics in the domain of kinship terminologies of signed languages. Analyzing kin terms' formational properties revealed emerging patterns corresponding to specific

semantic domains in signed languages. Examining semantics in kin terms revealed functions encoded by formational properties.

Cross-linguistic patterns revealed that location is most likely to be preserved in kin terms derived from person terms. The semantic property encoded by location functions as a potential gender marking in American and Quebec Sign Language. Japanese and Korean Sign Language preserved handshape in their kin terms as expressed in person terms. Some kin terms overlap in both location and handshape of person terms. The generalization these patterns suggest is that location is most likely to be preserved; motivated by specific semantic properties.

Patterns within the domain of signed kin terms illustrate that the phonological feature of location is a significant indicator that a phoneme functions as a morpheme. This observation parallels Boyes-Braem's finding that handshape signifies an inherent semantic property (1981). These findings describe the trend that signed forms' phonological properties are not simply phonemic representations, but instead are phonological properties that inherently signify semantic properties. While semantics encoded in these phonological properties may be either iconically motivated or arbitrary, the interaction of phonology and semantics is strongly intertwined. Boyes-Braem proposed that phonological features are likely to be semantically significant as found by the study and analysis of handshape as a signifying property.

Patterns revealed with a few exceptions that most parental terms are located on the face. While patterns illustrated different conceptual variations of *man* and *woman*, specific image schemas framed person terms with schematized references of

physiobiological or cultural-specific properties (E.g. *mustache* for *man*, *nose piercing* for *woman*). Some kin terms derived from these person terms, leading to a prevailing pattern of parental terms located on the face. In contrast, a few signed languages' parental terms do not derive from person terms. While parental terms are realized on the face, person terms were located in different locations other than the face (E.g. chest, neutral space). For instance, Panamanians produce *man* on the chest, but their parental terms realize on the face. The surprising pattern of parental term location on the face begs further investigation to examine what motivations drive this highly frequent pattern.

Exploiting location differentiates gender in the semantic domain of person and parental terms. The significance of location on the face may be accounted for by the circumstance that salient iconic properties easily exploit from the face. This type of sign formation parallels a similarity in that many deaf people's signed names also locate on the face. Signed names tend to reflect a descriptive characteristic of the deaf person that is distinct from other people (e.g. a scar on the cheek), indicating that signed forms to refer to people may underlie the propensity that distinct features on the face are easily captured and illustrated compared to other areas on the body and in signing space. However, more investigation is needed as many signed languages have not yet been described or signed names examined to identify possible factors underlying the significance of location to discriminate gender in person and parental terms.

Four types of parental terms studied were not produced on the face. The first type can be characterized by the production of parental terms in the neutral space constructed with two-manual initialized handshapes as observed in British, Australian, and New

Zealand Sign Language. British, Australian, and New Zealand person terms do not motivate these parental forms. Rather, British person terms are situated on the face. Similarly, a second type can be characterized by parental terms with one-manual handshapes in neutral space. Irish forms a one-manual initialized handshape using two hands in the neutral space for parental terms, while Irish person terms are located on the chest. A third type illustrates parental terms metonymically mapped to conceptual domains other than the semantic domains of person terms. Argentinean and Turkish forms for *mother* exploit the image schema of *female breast* while their female person terms locate on the face. A fourth type involves semantic extension as seen in Namibian. Namibian realizes parental terms on the chest, which are semantically extended from person terms. These four types are characterized by formal descriptions of parental terms located in signing spaces other than on the face.

Patterns of parental terms' formal expressions led to two linguistic generalizations; that parental terms are likely to be produced on the face (by probabilistic analysis), and that they contain two distinct forms for *mother* and *father*. Generalizations drawn from this study revealed that formational properties motivate by iconicity and/or arbitrariness. In short, some person terms do drive formation of some parental terms, but most person terms realize on the face (E.g. French). Within the pattern of semantic derivation between *man* and *father*, location tends to be preserved in forms for *father*—suggesting location signifies a semantic property. Some parental terms that locate on the face show no phonological overlap with person terms; indicating these terms are produced using conceptual domains other than person terms (E.g. Danish). Examination

of parental terms provided interesting clues to the interaction of phonology and semantics. Further investigation exploring the driving factors behind the realization of parental terms on the face could lead to the development of linguistic generalizations based on a comprehensive analysis of parental terms.

Lexical Similarity in Signed Kin Terms: Categorizations by Types of Iconic Properties

The high incidence of lexical similarity in the signed lexicon may be attributed to inherent iconic properties. While transparency may be evident in signed forms, transparency in signs can only be determined by the linguistic and cultural perceptions shared by signers. All iconic forms are not necessarily transparent to signers of different signed languages and cultures. Iconicity is a cognitive mechanism that drives sign formation, enabling categorization by different types of iconic properties as demonstrated by cross-linguistic data of signed kin terms.

While semantic concepts in signed languages do not necessarily produce identical phonological forms, signed languages exploit semantic properties facilitated by iconic properties. To account for the high incidence of lexical similarity in signed languages, universal (physical-cognitive) and cultural-specific properties drive the different types of iconic properties manifested in kin terms. Types of iconic properties are defined by inherent properties of physiobiological human traits, universal human cognitive experiences, and cultural-specific properties.

The physiobiological human traits manifested in many signed languages exploit human physical descriptions attributed to male and female humans. For instance, 25 signed languages studied realized *man* by the male physique of *beard* or *mustache*, while

15 signed languages exploited female physique of *breast* to form *woman*. For example Argentinean and Turkish formed *mother* by metonymically mapping to the female breast while many signed languages exploited the iconic schema of *beard* to produce *father* (E.g. Persian). Signed languages exploit physical characteristics of male and female humans; demonstrating one type of lexical strategy in forming signs.

The examination in this study of certain iconic forms that cut across signed languages underscored inherent properties underlying human cognitive experience. The iconic form for *baby* in many signed languages metonymically maps to the image schema of holding a baby in arms, and in some cases, also depicts the small physical size of the baby. Cradling a baby in arms is very likely a universal human behavior of handling a baby.⁶² The motivation of the sign for *child* referencing short height reflects a cognitive and physical relationship relative to the physical height of a mature adult as compared to a young child. In turn, the short height metaphorically denotes the concept of *youth*. The metaphorical form of *child* prevalent in many signed languages studied underscored the inherent property of the physiobiological experience of all humankind.

Some offspring terms were found to construct using the metonymic form for *giving birth*. These offspring terms form *giving birth* with two hands moving in a sagittal

⁶² While the form of cradling a baby in the arms may be a human universal behavior, handling a baby may be culturally dependent such as carrying the baby on the back of a caregiver in indigenous societies.

arc from the torso area to neutral space.⁶³ This phonological structure reflects how human females give birth. The similarity in the phonological form of *birth* across signed languages demonstrates that the concept of *giving birth* maps to the universal experience of female humans giving birth. The universal cognitive experience of giving birth drives a high incidence of lexical similarity across signed languages. The semantic domains of *baby*, *giving birth*, and *child* exploit iconic properties inherently drawn from universally human cognitive experience.

Another set of iconic properties specified by cultural descriptions is illustrated by some kin terms. The cultural-specific property of *hijab* (outer clothing worn by Islamic women masking all but the face and hands) was found to motivate the form of *mother* in Persian Sign Language. A few signed languages metonymically formed *woman* by mapping to the conceptual domain of *nose piercing*. The exploitation of the cultural specific property of *nose piercing* illustrated that cultural experience does shape people's perspective of women. The salience of conceptual references (E.g. *woman*) was found to vary across cultures, producing variations of formal descriptions in different signed languages.

⁶³ Hong Kong produced *giving birth* in a different phonological form. The Hong Kong form reflects a subjective frame of *giving birth* where an actor is not involved rather than being framed by an objective perspective where an actor is involved. Wilcox and Wilkinson (2006) defined *subjective* and *objective* framed by Langacker's grounding model in signed language analyses.

This study revealed that iconic forms are motivated by universal and cultural-specific properties; robustly producing kin terms in signed languages. While these iconic properties motivate universal human physiobiological and cognitive traits, some of these properties are transparent as these signed forms may be understood across signed languages of different cultures. However, some of these signed forms may not necessarily convey similar semantics as some forms may semantically extend to several different referents (E.g. semantic extension of *mustache*: *man*: *father*) in some signed languages while some forms specify a semantic reference (E.g. *mustache* is only *mustache* in some signed languages while *mustache* may semantically extend to *man* and/or *father* in other languages).⁶⁴ These conceptual frameworks mapped to iconic properties cannot necessarily be considered to be semantic universals across all signed languages.

In contrast, cultural-specific properties were also found to produce some kin terms; indicating that these cultural descriptions may not be transparent across cultures. This iconic motivation reflects what Croft describes as how “the structure of language reflect[s] in some way the structure of experience...the structure of the world including the perspective imposed on the world by the speaker” (2003, p. 102). As a result, formal

⁶⁴ While the form of *mustache* may only refer to the concept of *mustache* in a certain signed language, its form may be semantically extended to include the concept of *man* and/or *father*. Another possibility is that the concept of *father* exploits the form of *mustache*, while its form (a pseudo-form reflecting an outline of a mustache) does not refer to the concept of *mustache* but to a different phonological domain.

properties draw from human universal and cultural-specific traits to produce signed forms; illustrating the pervasiveness of iconicity in signed languages.

Descriptions of formal expressions reveal iconic properties motivated by selected salient image schemas. Different types of iconic properties produce lexical variations in signs that connote similar semantic properties. In contrast, unrelated signed languages may independently construct signs by mapping to the same image schema; resulting in formations of similar formal descriptions denoting the same semantic properties. This phenomenon rests on the concept of *shared symbolism* as proposed by Guerra Currie *et al.* (2002), which drives a higher incidence of lexical similarity across signed languages.

Trends defined by similarity in formal expression across signed languages revealed cognitive mechanisms of human languages. The visual-gestural modality affords signed languages the mechanism to construct forms by exploiting visual elements associated with conceptual references. The transmission of visual elements into visual-gestural forms can be a powerful, yet economical strategy for producing signs—reflecting cognitive mechanisms at work in signed language construction. The similarity of many formal expressions indicate cognitive mechanisms drive signed languages to exploit salient characteristics attributed to common conceptual references; accounting to some degree for the high degree of lexical similarity that occurs in some semantic domains.

Evidence of similarities in iconic, metaphorical and metonymic forms across signed languages parallels findings drawn from lexical similarity analyses in signed languages. Findings of proportionally high lexical similarity in signs across signed languages in the current study are consistent with what other studies found with respect to

the small set of image schemas apparent in *man* and *woman*. This study concurs with Sasaki (2007) and Guerra Currie *et al* (2002)'s proposition of *shared symbolism* that schematized iconic properties drive a high degree of lexical similarity in signed languages. A small range of image schemas manifested in similar semantics denoting person terms may have emerged independently – as many signed languages examined do not have a close genetic relationship (e.g. Afghan and Argentinean expressed a similar form for *man*, mapping to the schema of *mustache*). Image schemas of person terms underscore mechanisms of human cognition and common experience.

Findings revealed interesting patterns of similar schematizations regarding the production of person and kin terms across signed languages. While similar schemas across signed languages exist, schemas manifested in some kin terms are clearly motivated. Signed languages do not produce kin terms identically—affirming that signed languages are not one universal language. The relationship between visual and visual-spatial medium affords signed languages an economical way to exploit visual information. Visual information is schematized by linguistic members' cognitive and cultural experiences, driving variation in word formation across signed languages.

The inherent properties enabling the exploitation of visual information shapes signed languages into one modality—visual-spatial. The visual-spatial modality affords signed languages the means to manifest visual elements directly as signed forms. As evidenced by variations in schematized iconic forms, signed languages are not universal but instead are shaped by visual information framed by physical and cultural properties.

Collective cognitive and cultural experiences shape how communities of linguistic members (signers) produce signs at a semantic-lexical level.⁶⁵

The mechanisms of iconicity seen in signed languages underlie the mechanism of human cognition. Human cognition searches for efficiencies to transmit meaningful information by selecting and schematizing properties that are most salient for people who share the same cultural and perceptual framework. As a result iconic properties framed by language-specific and cultural specific mappings lend to variations in signs. In turn, iconicity emerges as an undeniable and powerful tool of schematization used to form signs in a visual-spatial modality.

Measurement of Complexity of Kin Terms in Signed Languages: The Search for Appropriate Linguistic Tools for Analyzing Kin Terms in Signed Languages

Conducting a typological study of signed languages' kin terms was a complicated task. To analyze semantic properties in signed forms requires the development of appropriate linguistic tools for signed languages. A major challenge lay with the

⁶⁵ Klima and Bellugi (1979) described different schemas manifested in iconic forms for tree in American, Chinese, and Danish Sign Languages. Among these three signed languages, the concept of *tree* was iconically formed. These forms for *tree* were encoded in different phonological formations; revealing different schematizations of the concept for *tree*. American schematized the tree trunk, tree branches, and the grounding of the tree. Chinese only depicted the tree trunk. Danish outlined the tree's top and tree trunk. The iconic form manifested revealed which salient properties were specified. Salient properties were chosen by schematization encoded in these iconic forms determined by language users of American, Chinese, and Danish signed languages. (p. 21).

measurement of the complexity of signed forms. The property of markedness is defined as the measurement of complexity in signed languages; defined by phonological, morphological, and syntactic properties. However, little is known how markedness is portrayed in signed languages. While markedness is better understood and described by linguistic patterns in spoken languages, linguistic tools used to determine markedness identify marked and unmarked categories present a risk of imposing conventionalized linguistic definitions of markedness in spoken languages inappropriately on our poor understanding of markedness in signed languages.

Defining markedness in signed languages requires addressing crucial theoretical and methodological issues that frame how markedness is deterministically portrayed in signed languages. The explanatory theory behind typological markedness involves token frequency as “phonological and semantically similar words are categorized and stored in relation to one another, morphological relations give arise to internal structure” (Bybee, 2001, p. 23-24). Typological markedness reflects the conceptual values of functions, whereas highly frequent constructions are unmarked compared to less frequent constructions that are grammatically restricted or semantically/pragmatically specialized. Examining structural properties in signed languages requires an extensive examination of signed lexicon and its use in discourse to ultimately lead to a better understanding of typological markedness in signed languages cross-linguistically.

Borrowing from traditional definitions of marked and unmarked categories in spoken languages may unintentionally suppress and/or neglect the inherent properties of iconicity prevalent in signed languages. For instance, should a derived form framed by a

metonymic schema be considered unmarked relative to another form that contains an arbitrary property specifying a semantic property? Another problematic issue involves initialization and fingerspelling/character writing constructions in kinship terminology. While some signed languages do not construct kin terms using initialization and/or fingerspelling construction, some languages do use them to form kin terms. A British example illustrates where parental terms for *mother* and *father* are realized by an initialized handshape of 'M' and 'F' while sibling terms for *sister* and *brother* contain no overlap of initialization. Should sibling terms be defined as unmarked compared to parental terms based on the manifestation of initialization? The assumption of initialization in kin terms as a marking convention leads to different organizational constructs of marked and unmarked categories of kin terms. Initialization as a marked linguistic property rests on Brentari and Padden's (2001) analysis of the lexicon of American Sign Language. Knowledge of the linguistic properties of signed languages is based on linguistic descriptions traditionally confined to American Sign Language and the other established signed languages of Europe and Canada.

As evidenced by this empirical study, signed kin terms are formed by combinations of initialization, fingerspelling/character writing constructions, and iconic descriptions. Linguistic processes robustly produce kinship terminology in signed languages. However, organization of kin terms by linguistic processes may not parallel what Greenberg found in his study of spoken languages. The nature of modality clearly manifests itself in different ways of organizing signed languages and spoken languages; illustrated by how markedness manifests differently. Further research is required to

improve understanding by developing adequate and appropriate tools to examine markedness and inform linguistic behaviors. Once armed with appropriate linguistic tools for analyzing markedness in signed languages, Greenberg's universals of kinship terminology can be tested to determine if they hold across signed languages.

Assigning Semantic Values in Signed Kin Terms: A Revisiting of Cuxac and Sallandre's Model of Process of Iconicization

The forty signed languages under study illustrated emerging patterns with regard to the correspondence between semantic domains and specific phonological structures in kinship terminology. Observing the interdependency between semantic domains and phonological structures in signed kin terms corroborated what Cuxac and Sallandre (2007) found that: "even the most imagic of them (iconic forms) ... organized in macro-structure articulated themselves in compositional morphemic elements" (p. 13).⁶⁶ Examining the composition of morphemic elements in signed kin terms revealed patterns of interdependency by semantic and phonological properties organized in a certain manner—that also included *transparent* (aka. imagic) signed forms.

Seeking morphological properties in signed kin terms, this study focused exploration on possible interdependencies between semantic and phonological properties. Data showed some kin terms were motivated by patterns of specific semantic-phonological interdependency. These patterns identified occurrences of semantic

⁶⁶ Cuxac and Sallandre described three coexisting forms of iconicity as defined by *imagic*, *diagrammatic*, and *degenerated iconicity*.

derivation and semantic extension within language-specific sets of kin terms. Iconic degeneration presents a key challenge of determining semantic values of kin terms that overlaps with phonological and semantic properties.

Cuxac and Sallandre used a modality-specific model of the *process of iconicization* to argue that all iconic forms are organized from meaningful elements represented by manual and non-manual features in signed languages. While in-depth discussion of the *process of iconicization* model is out of the scope of this discussion, focus on their definition of *transfer of and size and/or form* (TF) is useful:

These structures are used to represent the partial or total size and/or form of place, objects or character. The eye gaze ‘establish’ a form (handshape and orientation of the hand(s) in space (delimited by the hand(s)) then follows along the form unfolds in space (movement of the hand(s)), qualified at the same time by the facial expression. (2007, pp. 12-13)

The definition of TF illustrates how one type of highly iconic structure may drive construction of lexicalized signs by overlapping with formational and semantic properties. In turn, a signed form composed of meaningful elements signifies values manifested as iconic elements in a sign, and may experience degeneration.

Degenerated iconicity is a process where highly iconic structures undergo stabilization, leading to lexicalization into a *frozen sign* (or a ‘non-illustrative intent’ as defined by Cuxac and Sallandre). Lexicalized forms motivated by highly iconic structures

degenerate as manifested in phonological (internal) changes and also experience semantic shift. Qualifying iconic characteristics of lexicalized forms as degenerated iconicity, two phenomena define it (Cuxac & Sallandre, 2007, p. 21):

29) Loss of/reduced iconic characteristics through refinement of a form composed of highly iconic structures

1. Loss of meaning specific to each iconic morpheme in the holistic form whose signified values is different than the sum of the values of each morpheme that composes it from highly iconic structures.⁶⁷

Cuxac and Sallandre argued that unstabilized forms manifested in highly iconic structures would become stabilized under the control of high-level constraints to avoid homonymy and maintain iconicity. Preservation of iconicity is designed to retain initial characteristics so that intents can succeed one another economically. The process of stabilization in highly iconic structures is most likely to be driven by frequency framed by the usage-based model. As a result, degenerated iconic forms are defined by semantically derived forms as by-products of linguistic economy brought on by a refinement of formational properties. While degenerative signs are stabilized forms of non-illustrative intents, these forms may re-activate iconic characteristics to mark an

⁶⁷ While Cuxac and Sallandre defined these phenomena, descriptions were slightly paraphrased for easier readability while preserving their overarching criteria.

illustrative intent—reverting to highly iconic structures, a phenomena that prevails in French Sign Language.⁶⁸

For instance, examination of three French forms of *descriptive-form-of-mustache*, *man*, and *father* reveals how degenerative iconicity takes place. Figures 12-14 are shown as followed:



Figure 12: French TF: descriptive form of mustache (with one path movement from upper lip to ispilateral neutral area. The quality of the movement is slower and more qualifying properties compared the French sign for man.)

⁶⁸ This phenomena is also observed in Italian and American Sign Language as described in an analysis by Anitorio Pizzuto, Rossini, Sallandre, and Wilkinson (2009), leading to the possibility that this phenomena may apply to all signed languages afforded by the properties inherent in the visual-gestural modality.



Figure 13: Lexicalized French sign: *man* (with one path movement from upper lip to ipsilateral neutral area)



Figure 14: Lexicalized French sign: *father* (with two internal movements of opening and closing index finger and thumb)

The three distinct French forms of *mustache*, *man*, and *father* overlap to some degree in terms of phonological properties, which leads to an overlap in semantics. The TF *mustache* depicts the form of *mustache*, which is defined as an illustrative intent form. Since the TF may be modified by the length and/or thickness of the mustache, the hand and/or the facial expression may qualify as a modification of TF *mustache*.

The French forms of *man* and *father* are derived from the highly iconic structure of *mustache* as a result of lexicalization. Lexicalized forms of *man* and *father* lost the illustrative intent to express and/or qualify the highly iconic structure of *mustache*. The forms for *man* and *father* do not denote *mustache*, but instead specify references to *man* and *father*. As *man* and *father* overlap in semantics, they also show phonological overlap with the handshape and location realized in *mustache*. This relationship between semantic and phonological properties reinforces Cuxac and Sallandre's proposition that these terms are "an aggregate of different compositional morphemes" in manual signed forms (2007, p. 15).

While *man* and *father* semantically derive from the French form of *mustache*, *man* and *father* underwent lexicalization to stabilize compositional elements of the highly iconic structure of *mustache*. Due to the refinement of formational properties in *man* and *father*, these forms also underwent a change in meaning from semantic values encoded in *mustache*.⁶⁹ These formational changes demonstrate a shift in semantics, illustrating degeneration of highly iconic structures.

Cuxac and Sallandre found that when prototypical forms of highly iconic structures undergo stabilization in terms of lexicalization, movement marks the highest degree of internal changes. For instance, the phonological structures of French *mustache*, *man*, and *father* overlap in handshape and location, but are differentiated by types of movement. As these forms experience a semantic shift from a highly iconic form, their

⁶⁹ This type of process is also known as semantic bleaching among analyses of spoken languages.

formal descriptions reflect a correlation between shift in phonological form and shift in semantic encoding. The French example of *mustache*, *man*, and *father* illustrates a process of iconicization; undergoing degeneration in phonological and semantic properties as compared to the prototypical form of *description-of-mustache*.⁷⁰ This study found movement of signed kin terms to be a formal distinction used to discriminate between semantically-related kin terms. The model *process of iconicization* affords the means to devise empirical studies to explore the quantification of semantic values by examining formational properties that overlap with semantically-related forms in signed languages.

Signed forms may be composed of more than one meaningful element, and may be motivated by iconic elements. While investigating the quantification of iconic elements in signs, Cuxac and Sallandre proposed that signified elements encoded in a signed form are morphemic, and that each morphemic element can be quantified within a sign. However, determining how to quantify morphemic elements in degenerated forms in comparison to highly iconic structures remains a challenge. Further research is needed to explore the assignment of semantic values by iconic elements in degenerated iconic forms and forms of highly iconic structures in signed languages.

⁷⁰ It is likely that the form for *mustache* is lexicalized in French Sign Language. However, French signers may produce the lexicalized form of *mustache* by qualifying the iconic appearance of a referred mustache through modification of size and form of *mustache*. The modification of *mustache* resulted by from transfer of size and/or form of *description-of-mustache*.

Examining how semantic properties correspond to formational properties could inform interaction between semantic domains and phonological structures in language-specific kinship terminology and merits further investigation. While the visual-gestural modality affords the exploitation of visual and spatial elements construed in a sign, these elements inherently form highly iconic structures. These forms may experience degeneration of iconic elements; illustrating semantic extension and semantic derivation through a continuum of qualified semantic values of signed forms. However, the organization of and interaction between formational and semantic properties continues to be poorly understood in signed language lexicon.

Framed by Cuxac and Sallandre's model of iconicization, future research entails the exploration of semantic value assignment of different types of formational properties in kinship terminology. Their model leads to a broad overview of semantic classes in language-specific and cross-linguistic analyses of kinship terminology in signed languages. Their methodology also provides for means to appreciate and measure complexity of kinship terminology within the visual-gestural modality. Cuxac and Sallandre's model of iconicization may prove to be valuable for more in depth explorations of semantic value assignment of different types of formational properties in kinship terminology. Their model provides indications for a broader understanding of semantic classes in language-specific and cross-linguistic analyses of kinship terminology in signed languages. Their methodology also provides for means to appreciate and measure complexity of kinship terminology within the visual-gestural modality.

Further study of the structural complexity of signed languages would contribute to a better understanding of markedness in signed languages. Analysis of the structural complexity of signed languages is needed to compare with Greenberg's 1966 findings regarding patterns of structural complexity in spoken languages. Future study should revisit Greenberg's proposal on universals of kinship terminology to establish whether or not they hold true as modality-independent language universals demonstrating similar behaviors in signed languages as in spoken languages. If patterns emerge in signed languages that confound Greenberg's universal proposition, then they represent modality-dependent patterns for spoken languages and are not modality-independent universals. Either way, findings drawn from more extensive empirical study of kinship terminology are needed to establish ground-breaking typological analyses of signed languages with implications to contribute to the field of linguistics.

Kinship Terminology as a Reflection of Social-Cultural Institution

Revisiting Greenberg's Analysis of Kin Types by the Examination of Patterns Emerged in Signed Languages

Data representing the 40 signed languages in the study provide emerging evidence that typological variation does exist among signed languages. Using a variety of analyses, this study investigated the hypothesis that signed languages can be classified as more than one language type. Within each signed language, generalizations were sought, then compared across the remaining signed languages of the study to determine whether or not they held true and corroborated the kin types of spoken languages as defined by Greenberg (1966). Replicating Greenberg's analysis of kin types using the data of 40

signed languages, findings revealed that signed languages reflect different types of kinship systems. By analysis of parental and parental' sibling terms in signed languages, three kin types have been attested (*lineal, bifurcate collateral, bifurcate merging*), while one kin type (*generational*) remained unattested. The fact that three distinct kin types have been attested demonstrates that signed languages to some degree parallel the attested kin types of spoken languages.

This study revealed evidence that typological variation does exist in signed languages. Analysis of kin types illustrated that signed languages can be categorized by three attested and modality-independent kin types (*lineal, bifurcate collateral, bifurcate merging*). The typology of kinship systems seen in signed languages is reminiscent of the relationship between kinship terminology and kinship system as described by Greenberg:

Providing the frame of hypotheses connecting terminology
with social institutions...a correlation involving kinship
and social institutions is a universal connecting linguistic
and non-linguistic social data, while a universal within
terminologies connects linguistic with other linguistic data,
and these are also in the broad sense social. (1966, p. 87)

Examination of kinship terminologies in signed language provides a wealth of information about social-linguistic aspects of cultural systems. Future research is needed to explore social-linguistic patterns drawn from kinship terminologies of signed and spoken languages co-existing in a shared social institution.

Comparing the Degree of Congruence in Signed Kin Terms with Spoken/Written Kin Terms with Their Surrounding Communities

Future studies should investigate the degree of congruence between signed and spoken/written kinship terminologies. While a few analyses have compared signed kin terms with the spoken/written kin terms used in their surrounding communities, these findings suggest that signed languages' kin terms do not share similar kinship distinctions with those observed in comparable spoken/written kin terms (Massone & Johnson, 1991 [Argentinean Sign Language], Peng, 1974 [Japanese Sign Language]).

Conducting a comparative analysis of signed language kinship terminology with surrounding spoken/written kinship terminology could discriminate degree of congruency between language forms and patterns of congruency. If language-specific signed kinship terminology were found to be congruent with surrounding spoken/written kinship terminology, this would suggest that kinship systems are a strong determinant of kinship terminology construction. In contrast, if signed language kinship terminology displays incongruence when compared to spoken/written kinship terminology, then the form of the language itself may be a stronger determinant than the kinship systems in forming kin terms. It is crucial to distinguish between kinship terminology (spoken and signed) and kinship system—as kinship terminology may not model the cultural distinctions that are made in the kin system.

Further research is needed to compare semantic distinctions encoded in kin terms in both signed and spoken languages as described by this study in different strategies in forming kin terms. Comparison of semantic distinctions could provide crucial insights

about the nature of congruency of kinship terminologies between signed and spoken languages. For instance, the kin term *cousin* in English is gender neutral while American Sign Language discriminates gender in *cousin-masculine* and *cousin-feminine* as a gender marking. As speakers of American-English and American Sign Language co-exist in the same cultural system, their languages' kinship terminologies are not in full congruence. The incongruence illustrated in gender distinction between English and American Sign Language suggests possible evidence that gender marking may be indigenous to American Sign Language, since gender distinction does not exist in the spoken English form of *cousin*. The potential in/congruence may be motivated by conceptualization driven by language and/or external linguistic influence by written forms of surrounding linguistic communities; framing yet another area worthy of additional research.

Comparative analysis of congruence in kin terms between signed and spoken/written languages could also extend insight into the anthropological issues of kinship systems in deaf communities. Kinship systems of signed languages need to be examined for correspondence to kin roles to determine degree of congruence between signed and spoken/written kin terms in terms of co-existing habitats. Exploring the full potential of typological variation would require review of indigenous societies with kinship systems different from American and European kinship systems.

Future studies should involve the development of frameworks including a description of kinship terminology by linguistic classification to codify linguistic behaviors. Such studies could lend significant insight into deaf culture relative to the societies of hearing people with whom they typically co-exist and intrinsically share

kinship systems. Undertaking additional studies of the kinship terminology of signed languages could also reveal insight into how different societies express signed language through salient linguistic structures that reflect their culturally-bounded kinship systems.

Replication of the study: Reliability of findings

As this study's methodological approach has been outlined in detail, other studies could use these methods as a model for replicating the study of language typology determined by kinship terminology of these or other signed languages, and/or other semantic domains determined by other phonological and lexical considerations. Replicating this study would require gathering data and conducting an analysis of a collection of signed language dictionaries or ethnographic interviews with native signers similar to the process employed in this study. Replicated studies could then be compared with patterns drawn from the current study to determine the reliability of these findings. Other signed languages not analyzed in this study could be studied using the same methodology. Replication of this typological analysis could inform the existing body of knowledge of signed language typology, and improve understanding of the relationship between phonological structures and semantic domains of both language-specific, emergent cross-linguistic patterns, and implications of these findings on linguistics and those who use signed languages.

Typological analyses validate the linguistic variation of a large range of genetically unrelated languages; defining generalizations and as well as identifying language universals. This study analyzed the typological variation of a large sampling of signed languages, illustrating linguistic variation within the domain of kinship

terminologies in 40 signed languages, and validated claims of generalizations and language universals in terms of modality-independence/modality-dependence.

Contributions of Signed Language Typology

Contributions of signed language typology provide insight into effects of modality-independent, modality-dependent, and language-specific behaviors. Language typology of both signed and spoken languages provides the means to determine generalizability across descriptions of language diversity and language universals.

This study contributes to the scholarly discussion of the field of signed language linguistics, and also to the field of linguistics in general. Findings of this study revealed that form-function mappings of specific semantic domains are constructed by different strategies including: iconicity motivated by universal human and cultural-specific traits, arbitrary elements, and linguistic economy (semantic derivation). Cross-linguistic study of signed languages revealed potential patterns of markedness in linguistic structures, contributing to better discrimination between the phonological features and morphological structures in signed languages. This study explored semantics inclusive of iconicity, schemas of metaphors and metonymies, and arbitrary properties in semantically-related signed forms.

This study also identified linkage between linguistics and anthropology of signed languages, enriching the body of knowledge affecting communities who communicate using signed languages. This study empirically examined a large diverse language sampling, including signed languages beyond the developed Western world. Even though many non-Western signed languages have not yet been formally described in academic

publications, these languages cannot be excluded from study as they contribute in a crucial way to our understanding of the typological variation in signed languages. Drawing from the field of linguistic anthropology, additional studies would complement the small, but growing, body of non-Western typological signed language studies (E.g. Rezenet Moges [Eritrean Sign Language], Angela Nonaka [Ban Khor Sign Language]).

Inclusion of both non-Western and Western signed languages is integral to understanding the typological variation among signed languages. Linguistic diversity enhances our understanding of language generalizations that do truly cut across all signed languages—revealing effects of modality-dependent and language-specific behaviors that improve our limited understanding. Clearly, this empirical study has embarked on a journey to begin to explore the overlapping bodies of knowledge of language typology and linguistic anthropology of signed languages.

Conclusion

This study explored whether Greenberg's 1966 proposal of universals of spoken kinship terminology also applies to signed languages. The overarching goal of revisiting Greenberg's proposal involved analysis of a large sampling of signed languages, which itself was ground-breaking. Data drawn from this study showed that signed languages can be categorized by the kin types defined by Greenberg (1966). This classification by kinship systems provides a significant contribution to the body of knowledge of the socio-cultural effects manifested in signed languages. Cross-linguistic patterns revealed that kin terms are constructed by different linguistic strategies; for example: *semantic extension*, *semantic derivation*, *metaphorical schemas*, *metonymic schemas*, *iconicity*,

initialization, and *juxtaposition*. Emerging evidence demonstrated that signed languages organize kin terms by specific patterns of semantic and phonological properties to differentiate among types of kin referents. Future research is needed to examine the organization of signed language kinship terminology in even more detail. Such studies will lend more insight into social-cognitive organization by language-specific and modality-specific patterns, as well as universal modality-independent effects of signed and spoken languages. The overarching aim of this typological analysis of signed language kinship terminology was to seek new pathways to increase understanding of universal characteristics of human cognition.

Typological studies of signed languages introduce a different perspective than spoken languages regarding: language typology, signed language linguistics, and overarching linguistic theory independent of modality. Examination of signed language kinship terminology in this study found generalizations and sought language universals defined independently from modality. This empirical cross-linguistic study of kinship terminology underscored the importance of theoretical and methodological frameworks appropriate for the modality-specific analysis of signed languages. Future typological analyses need linguistic tools appropriately tailored to the visual-gestural modality to assess the structural complexity of language-specific kinship terminology of signed languages. Throughout this exploration of typological variation, issues arose regarding the definition of markedness - a concept correlated to structural complexity in signed languages. Markedness in signed languages remains under-described and poorly understood in the ways that many signed kin terms exploit iconicity - providing an area to

research crucial to furthering understanding of signed languages. These factors underscore the debate of defining phonemes and morphemes in signed languages. Furthermore, this study revealed crucial issues involved in the definitions of phoneomes, morphemes, complexity, and markedness necessary to pursue lexical and morphological typology in signed languages. This study demonstrated the feasibility of such research by developing methods to explore constraints within the range of structural variations across signed languages representative of linguistic universals and language types described in Greenberg's 1966 analysis of "Universals of Kinship Terminology".

This study of kinship terminology uncovered a great wealth of information drawn from trends that emerged from the examination of signed languages. The interaction of semantics and phonology in the signed kin terms examined portrayed fascinating insights into behaviors that contribute to kin term construction. While iconicity is undeniably pervasive in signed languages, salient properties manifested in signed kinship terminology are not universal, but instead reflect the cultural and cognitive perception experienced by deaf people within their linguistic communities. The extent of linguistic phenomenon seen in the domain of kinship terminology underscores the importance of exploring semantics through studies of phonology, morphology, and grammar. Future cross-linguistic studies would benefit from large samplings of geographically and genetically diverse signed languages including those that are urbanized as well as those that are less-urbanized.

Moving past the historical controversy concerning the validity of signed languages as full-fledged languages, this study acknowledges that Deaf people do

communicate by systematic means conveyed through semantics and linguistic conventions. The bias inherent in many theoretical proposals in traditional linguistic thinking must be addressed as these works were based solely on the vocal-auditory modality. While modality-specific effects are clearly noted by type of modality transmission, language universals that underscore mechanisms of human cognition were the quest of this investigation. Language samplings of vocal-auditory and visual-gestural modalities provide the potential to differentiate modality-dependent and modality-independent behaviors. Positing language universals by incorporating both modalities provides one additional key to unlocking the mystery of human cognition.

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APPENDIX A: DATA SOURCES OF SIGNED LANGUAGES

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Dzhongozova, S., Moshjeva, M., & Staijkov, L. (1996). *B'lgarski zhestomimichjen rjechnik*. Sofija: Kurazh Tishina.

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APPENDIX B: SOURCES FOR WRITTEN TRANSLATION EQUIVALENCES

Table B1

Consultants used to confirm written translation equivalences

Written Languages	Consultants	Affiliation
Bulgarian	Susan Metheny	University of New Mexico, USA
	Evgenia Prozorova	Moscow State University, Russia
Danish	Janne Boye Niemelä	Centre for Sign Language and Sign Supported Communication- KC, Denmark
Dari	Dan Parvaz	University of New Mexico, USA
	Justin Powers	SERVE-Afghanistan
Dutch	Richard Cokart	Universiteit van Amsterdam, the Netherlands
French	Thierry Haesanne	PROFILS, Institut Libre Marie Haps, Brussels, Belgium
German	Simone Kollien	Universität Hamburg, Germany
	Agnes Villwock	Universität Hamburg, Germany
Hebrew	Dan Parvaz	University of New Mexico, USA
	Ido Roll	Carnegie Mellon University, USA
Italian	Paolo Rossini	CNR-ISTC; University of Rome Three, Italy
Japanese	Yumi Watanabe	University of New Mexico, USA
Korean	Sung-Eun Hong	Universität Hamburg, Germany
Spanish	Juan Carlos Druetta	Argentina
	Ana Medina Murillo	University of New Mexico, USA
Russian	Evgenia Prozorova	Moscow State University, Russia
Thai	Logan Sutton	University of New Mexico, USA
Turkish	Deniz Ilkbasaran	University of California, San Diego, USA
Urdu	Sabrina Pehrs	Universität Hamburg, Germany

Becker, B. P. (2002). *Thai-English English-Thai Dictionary: [with transliteration for non-Thai speakers]*. Bangkok: Paiboon Publishing.

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APPENDIX C: LIST OF SIGNED LANGUAGES CATEGORIZED BY GEOGRAPHIC

MACRO-REGIONS

Table C1

Signed languages by macro-geographic region

Geographic Macro-Region	Signed Languages in English	Signed Languages in Native Written Language where applicable	Acronyms of Signed Languages
<i>Africa</i>	Kenyan		KSL
	Namibian		
	Tanzanian	Kamusi ya Lugha ya Alama ya Tanzania	LAT
	Ugandan		USL
<i>North America</i>	American		ASL
	Mexican	Lengua de Señas Mexicana	LSM
	Quebec	Langue des Signes Québécoise	LSQ
<i>Central America</i>	Panamanian	Lengua de Señas Panameñas	LSP
<i>South America</i>	Argentinean	Lengua de Señas Argentina	LSA
	Brazilian	Língua Brasileira de Sinais	LIBRAS
<i>Middle East</i>	Israeli		ISL
	Persian		
	Turkish	Türk İşaret Dili	TİD
<i>Central Asia</i>	Afghan		
	Indo-Pakistani-Bangalore		IPSL-Bangalore
	Indo-Pakistani-Karachi		IPSL-Karachi
	Mongolian		
	Nepali		NSL
	Tibetan		
<i>Far East Asia</i>	Chinese	Zhōngguó Shǒuyǔ	ZS (or CSL)
	Hong Kong		HKSL

Geographic Macro-Region	Signed Languages in English	Signed Languages in Native Written Language where applicable	Acronyms of Signed Languages
<i>South East Asia</i>	Japanese	Nihon Shuwa	NS (or JSL)
	Korean		KSL
	Ho Chi Minh City		HCMCSL
	Modern Thai		MTSL (or TSL)
<i>Austronesian</i>	Australian		Auslan
	New Zealand		NZSL
<i>Europe</i>	British		BSL
	Bulgarian		
	Croatian	Hrvatski Znakovni Jezik	HZJ
	Danish	Tegnsprog	TS
	Dutch	Nederlandse Gebarentaal	NGT
	Finnish	Suomalainen viittomakieli	SVK
	French	Langue des Signes Française	LSF
	German	Deutsche Gebärdensprache	DGS
	Irish		ISL
	Italian	Lingua Italiana dei Segni	LIS
	Norwegian	Tegnspråk	TS
	Russian	Russkii Zhestovyi Yazyk	RZY (or RSL)
	Swedish	Svenskt Teckenspråk	STS

APPENDIX D: TRANSCRIPTION CONVENTIONS

Table D1

Transcription conventions

Notation	Example	Definition
Italics	<i>sister</i>	A written translation equivalence to represent the signed form by preserving semantics encoded in the signed form.
Brackets	[<i>woman</i>] [<i>same</i>] [<i>affinal</i>] for Afghan term ' <i>sister-in-law</i> '	A juxtaposed construction of two lexical units (or more) to represent a kin referent. The brackets clearly indicate how many signs are expressed
'+'	[<i>boy</i> + <i>child</i>] for Norwegian term <i>son</i>	A compounded form is represented by a plus symbol (+) in between two morphemic elements.
Upper case letters	DEDUSHKA 'grandfather' in Russian Sign Language	A word-label to represent a signed form.
Hyphens between words	ELDER-BROTHER in Japanese Sign Language	A signed form (one lexical unit) consisted of more than one morphemic unit. For instance, Japanese's <i>elder-brother</i> fuses together <i>elder</i> with <i>male</i> gender marking in one holistic form.
	<i>cousin-feminine</i> in Mexican Sign Language	An encoding of semantic distinction in kin referents. For instance, some languages mark gender to discriminate between male and female cousins.
Hyphens between letters or characters	V-O-V-O 'grandparent' in Brazilian Sign Language	A fingerspelled or character written word
Apostrophes at the beginning and end of the letter	'U' in <i>uncle</i> in Ugandan Sign Language	An initialized handshape overlapped in the signed form; corresponded to the first letter in the written form

APPENDIX E: DATABASE SCHEMAS FOR CODING OF KIN TERMS

Table E1

Phonological variable definitions and coding

Variable	Definition	Phonological coding
Signed language	Name of the signed language	By name of the signed language
Geographical region	In what region the signed language is located	By region of Africa, Central America, North America, South America, Central Asia, Far East Asia, Southeast Asia, Austronesia, Europe and the Mideast
Word-label ("gloss")	Written representation of the kin term as given in the dictionary, reflecting the meaning in the spoken language	By either in their orthographic or alphabetic system (Romanized letters)
English translation equivalent	Translated equivalent of the signed kin term into English	English equivalent term
Type of term	Identified the sign to be person or kin term	Either person or kin term
Source location	Page number or coded reference where the sign appears in signed language's dictionary	Number or coded reference
Count of lexical units	Number of lexical units conveyed in the kin term	Coded by numeral values of 1, 2, 3, or 4
Position (ordering) of a lexical unit within the construction of a kin term	Ordered position of the given lexical unit within the construction of the kin term	Numerical values: first lexical unit, second lexical unit, third lexical unit, or fourth lexical unit
Position of a sign	Position of a unit (in sequence)	Either as initial position or final position
Count of hands	Count of hands realized in a unit	Either as one or two-manual signs

Variable	Definition	Phonological coding
Dominance of hands	Which of the hands is used, reflecting the dominance of the hands	Dominant hand, non-dominant hand or symmetrical hands ⁷¹
Selected fingers	Selection of fingers	Selected fingers: Thumb, Index, Middle, Ring, Pinky
Shape of finger joint	Shape of finger joint	Straight, bent, curved
Handshape	Form of handshape	Open, closed, fist, spread, stacked, flat
Initialized handshape	Realization of initialized handshape	Representation of the initialized letter shape (E.g. 'F' in FRÈRE 'brother' in French Sign Language)
Fingerspelling	Kin term realized via fingerspelling (E.g. Australian, S-O-N 'son')	Either yes or no
Location of the unit	Location of the unit situated in the signing space	Back of the head, top of the head, forehead, eye, cheek, ear, nose, jaw, upper lip, mouth, chin, under chin, torso top, torso mid, torso bottom, waist, hips, forearm ulnar, neck, shoulder, clavicle, upper arm, elbow, back of elbow, forearm front, back of forearm, forearm ulnar, back of the wrist, front of the wrist, radial of the wrist, back hand, front hand, radial hand, ulnar hand, thumb, index finger, middle finger, ring finger, pinky finger, between index and middle fingers, between thumb and index fingers, inside of the fist, behind waist/back, neutral space

⁷¹ Identifying the hand dominance maintains a consistent platform to compare with other signed constructions, avoiding potential confusion posed in dictionaries consisted of more than one signing model. Signers choose their hand dominance as either right-handed or left-handed; therefore, it is more consistent to code either dominant and/or non-dominant hand, avoiding potential confusion with right and left hands.

Variable	Definition	Phonological coding
Contact of the unit	Unit contact on the signer (or not)	Either yes or no
Plane of articulation	Reflects where the unit moves in the signing space	Where the unit is articulated with respect to the plane of the signing space: horizontal; sagittal; up; down
Lateral orientation	Orientation of where the hand is situated in the signing space with respect to the lateralization of the signer	Ipsilateral; contralateral; center
Directionality of sign proximity in neutral space	If the sign realizes with movement in the neutral space, then this decoding provides a clear description on the proximity of the sign. The proximity of the sign reflects the initial and final positions within the neutral space.	Directionality of movement; where the sign moves from and to in the signing space <ul style="list-style-type: none"> • Near → away from the signer • Away → to the signer
Shape of movement	Shape of movement	Arc, circular, straight, stative
Internal movement of fingers and wrist	Realization of internal movement in selected fingers and/or wrist, if any	Finger wriggle, finger open, finger close, finger open-close, tap, trilled, wrist flick, wrist twist
Count of path movement	Count and type of movement in the form (E.g. 2 counts of straight movements encoded in Danish Sign Language 'grandfather')	<ul style="list-style-type: none"> • Numeral value of 1, 2, 3, 4 • Type value of bidirectional or alternating
Count of internal movement	Count and type of movement in the form (E.g. 2 counts of bending digital joints realized in Russian Sign Language 'grandfather')	<ul style="list-style-type: none"> • Numeral value of 1, 2, 3, 4 • Type value of bidirectional or alternating
Palm orientation	Orientation of the palm	Where the palm is orientated in the signing space: toward signer, away from signer, up, down, ipsilateral, contralateral
Image of kin term	Stored images of kin term	Formats as either scanned photos or QuickTime video clips

Table E2

Semantic derivation variable definitions and coding for parental terms

Variable	Definition	Phonological coding
Person term	Lexical unit in reference to person term	Man/boy/male; woman/girl/female
Is the kin term <i>father</i> semantically derived from the person term <i>man</i>	Comparison of the phonological structure of the kin term <i>father</i> and person term <i>man</i> . If there are one or more phonological parameters that overlap, then this suggests the kin term was derived from the person term.	Either yes or no
Handshape of male	Is the handshape of the kin term <i>father</i> similar to the person term <i>man</i> ?	Either yes or no
Location of male	Is the location of the kin term <i>father</i> similar to the person term <i>man</i> ?	Either yes or no
Movement of male	Does the kin term <i>father</i> show a similar movement as observed in the person term <i>man</i> ?	Either yes or no
Physical attribute of male	Does the person term <i>man</i> reflect physical attribution of a male?	Either yes or no
Description of physical attribute of male	Describe the physical attribution of a male (E.g. mustache, beard)	Description
Cultural attribute of male	Does the person term <i>man</i> reflect cultural attribution of a male?	Either yes or no
Description of cultural attribute of male	Describe the cultural attribution of a male (E.g. hat)	Description
Is the kin term <i>mother</i> semantically derived from the person term <i>woman</i>	Comparison of the phonological structure of the kin term <i>mother</i> and person term <i>woman</i> . If there are one or more phonological parameters that overlap, then this suggests the kin term was derived from the person term.	Either yes or no
Handshape of female	Is the handshape of the kin term <i>mother</i> similar to the person term <i>woman</i> ?	Either yes or no
Location of male	Is the location of the kin term <i>mother</i> similar to the person term <i>woman</i> ?	Either yes or no

Variable	Definition	Phonological coding
Movement of female	Does the kin term <i>mother</i> show a similar movement as observed in the person term <i>woman</i> ?	Either yes or no
Physical attribute of female	Does the person term <i>woman</i> reflect physical attribution of a female?	Either yes or no
Description of physical attribute of female	Describe the physical attribution of a female (E.g. breasts)	Description
Cultural attribute of female	Does the person term <i>woman</i> reflect cultural attribution of a female?	Either yes or no
Description of cultural attribute of female	Describe the cultural attribution of a female (E.g. nose ring)	Description

Table E3

Kin term relations variable definitions and coding

Variable	Definition	Phonological coding
Person term	Lexical unit in reference to person term	Man/boy/male; woman/girl/female
Kin type category	Categories of kin types	Parent, child, sibling, spouse
Kin type	Types of kin relations	According to conventionalized representations in anthropology (E.g. M=Mother; F=Father, MZ=Mother's Sister, FB=Father's Brother)
Gender of relative	Gender of the relative	Male, female, neutral
Gender of connecting relative	Gender of the connecting relative (E.g. <i>maternal uncle</i> : the lineage is through the female kin member)	Male, female, neutral
Lineal	If the kin term encode lineal kin relation, then what degree of lineage is this relation (E.g. <i>great-grandmother</i> : ascending)	Ascending, descending, similar
Collateral	If the kin term encode collateral kin relation, then what degree of lineage is this relation (E.g. <i>nephew</i> : descending)	Ascending, descending, similar, other
Consanguineal / Affinal	Reference to the kin relation based on blood or marriage (E.g. <i>brother-in-law</i> : affinal-in-law)	Affinal (by marriage), affinal step, affinal in-law, consanguineal
Nuclear vs. nonnuclear kin	Does the kin term refer to nuclear member or not	Either yes or no
Social status hierarchy	Does the kin term reflect social status hierarchy	High status, low status, neutral status
Relative age	Does the kin term reflect age relationship of Ego?	Younger, older, similar, first, second, third, fourth, last
Degree of separation	What is the degree of separation between kin member and Ego?	Numeral values of 0, +1, +2, +3, +4, -1, -2, -3, -4
Number status	Does the kin term reflect singular, dual, or plural?	Numeral values: one, two, or more than one

APPENDIX F: FINDINGS OF CROSS-LINGUISTIC PATTERNS IN SIGNED KINSHIP TERMINOLOGY

Table F1

Count of person terms reported in signed language dictionaries

Macro-Geographical Region	Signed Language	<i>man</i>		<i>woman</i>		<i>boy</i>		<i>girl</i>		Grand total
		1 Lexical Unit	2 Lexical Units	1 Lexical Unit	2 Lexical Units	1 Lexical Unit	2 Lexical Units	1 Lexical Unit	2 Lexical Units	
<i>Africa</i>	Kenyan	1		1		1		1		4
	Namibian	2		1		1		1		5
	Tanzanian	1		1		1		1		4
	Ugandan	1		1		1		1		4
<i>North America</i>	American	1		1		1		1		4
	Mexican	1		1		1			1	4
	Quebec	1		1						2
<i>Central America</i>	Panamanian	1		1			1		1	4
<i>South America</i>	Argentinean	1		2						3
	Brazilian	1		1		1	1		1	5
<i>Central Asia</i>	Afghan	1		1			1		1	4

Macro-Geographical Region	Signed Language	<i>man</i>		<i>woman</i>		<i>boy</i>		<i>girl</i>		Grand total
		1 Lexical Unit	2 Lexical Units	1 Lexical Unit	2 Lexical Units	1 Lexical Unit	2 Lexical Units	1 Lexical Unit	2 Lexical Units	
	IPSL-Bangalore	1		1		1		1		4
	IPSL-Karachi	1		1			1		1	4
	Mongolian	1		1						2
	Nepali		1		2	1			2	6
	Tibetan	1		1						2
<i>Far East Asia</i>	Chinese	1		1			1		1	4
	Hong Kong	1		1						2
	Japanese	1		1			1		1	4
	Korean	1		1		1		1		4
<i>South Asia</i>	Ho Chi Minh City	1		1						2
<i>East Asia</i>	Thai	1		1				1		3
<i>Middle East</i>	Israeli	2		1						3
	Persian	1		1		1		1		4
	Turkish	2		1						3
<i>Austronesia</i>	Australian	1		3		2		2		8
	New Zealand	1		1		2		3		7
<i>Europe</i>	British	2		1		1				5

Macro- Geographical Region	Signed Language	<i>man</i>		<i>woman</i>		<i>boy</i>		<i>girl</i>		Grand total
	Bulgarian	1		1		1				4
	Croatian	1			1					2
	Danish	1		1		1		1		4
	Dutch	1		1		1		1		4
	Finnish	1		1		1		1		4
	French	1		1		1		1		4
	German	1		3		1		1		6
	Irish	1		1		1		1		4
	Italian	1		1						2
	Norwegian	1		1		1		1		4
	Russian		1		1	1		1		4
	Swedish	1		1						2
	Grand Total	42	2	43	4	24	7	22	10	154

Table F2

Distinct forms for boy and girl in signed languages

Distinct form	<i>boy</i>	<i>girl</i>
Signed Languages	French	Australian-1
	Irish	Australian-2
	Nepali	Danish
	New Zealand-2	Dutch
	Persian	Irish
	Ugandan	New Zealand-1
		New Zealand-2
		New Zealand-3
		Persian
		Thai
		Ugandan
Total	6 signed languages	9 signed languages

Note: The number assigned to the signed language specified a lexical variant, where the signed language reported more than one lexical variant for boy and girl.⁷²

⁷² New Zealand reported two lexical variants of *girl* that did not contain phonological overlap with *woman* while one lexical variant of *boy* was expressed distinct from the form of *man*.

Table F3

Distribution of phonological overlap of boy with man in 40 signed languages

Signed Language	Handshape	Location	Path Movement	Internal Movement
American		X		
Australian-1		X		
Australian-2		X		
Brazilian-2		X	X	
British		X		
Dutch	X	X		
Finnish		X	X	
German		X		
IPSL-Bangalore	X	X		
Kenyan		X	X	
Korean	X			
Mexican		X		
New Zealand-1		X		
Namibian		X		
Norwegian		X		
Tanzanian		X	X	
Total	3	15	4	0

Note: The number assigned to the signed language specified a lexical variant, which the signed language reported more than one lexical variant for boy and girl.

Table F4

Phonological overlap of girl with woman in signed languages

Signed Language	Handshape	Location	Path Movement	Internal Movement
American		X		
Finnish		X		
French		X	X	
German-1	X	X		
German-2		X		
IPSL-Bangalore		X		
Kenyan		X		
Korean	X			
Namibian		X		
Nepali-1	X	X	X	
Norwegian		X		
Tanzanian		X		
Total	3	10	2	0

Note: The number assigned to the signed language specified a lexical variant, where the signed language reported more than one lexical variant for boy and girl.

Table F5

The forms of boy and girl constructed of two forms: [man or woman] with another term denoting [child].

	<i>man</i>	<i>woman</i>
<i>child: person whose height is short</i>	Afghan	Afghan
	Brazilian	Brazilian
	Bulgarian	Bulgarian
	Chinese	Chinese
	IPSL-Karachi	IPSL-Karachi
	Japanese	Japanese
	Panamanian	Panamanian
	Russian	Russian
	Danish	
Total	9 signed languages	8 signed languages

Table F6

Distribution of image schemas of man in 40 signed languages

Schemas	<i>beard</i>	<i>mustache</i>	<i>folk etymology of tipping men's hat</i>	<i>hair</i>	<i>others</i>
Location	chin	upper lip	forehead	ipsilateral side of head	
	Australian	Afghan	American	Chinese	Irish
	Brazilian	Argentinean	Danish	Hong Kong	Israeli
	British	Bulgarian	Dutch	Thai	Italian
	Ho Chi Minh City	Croatian	Finnish		Japanese
	Kenyan	French	German		Korean
	Mexican	IPSL-Bangalore	Norwegian		Mongolian
	Namibian*	IPSL-Karachi	Quebec		Panamanian
	New Zealand	Nepali	Russian		
	Tanzanian	Persian	Swedish		
	Turkish*	Tibetan			
	Ugandan	Turkish*			
	11	11	9	3	7

Table F7

Distribution of image schemas of woman in 40 signed languages

<i>folk etymology</i>	<i>breast</i>	<i>earring</i>	<i>hair</i>	<i>nose- piercing</i>	<i>lipstick</i>	<i>hijab</i>	<i>others</i>
cheek; lower jaw	ipsilateral chest	ear	hair	nose	mouth; chin	ipsilateral sides of face	
American	Danish	Chinese	Afghan	IPSL- Karachi	Argentinean	Persian	Korean
Australian	Finnish	Croatian	Bulgarian	Nepali			Japanese
Brazilian	German	Dutch	Tibetan				Irish
British	Kenyan	German					
French	Namibian	Hong Kong					
Ho Chi Minh City	Norwegian	Israeli					
IPSL- Bangalore	Swedish	Panamanian					
Italian	Tanzanian						
Mexican	Ugandan						
Mongolian	Australian*						
Nepali	British*						
Quebec	New Zealand*						
Russian							
Thai							
Turkish							
15	12	7	3	2	1	1	3

Table F8

Distribution of lexical count of kin terms accounted for in signed language dictionaries

Macro-Geographical Region	Signed Language	1 Lexical Unit	2 Lexical Unit	3 Lexical Unit	4 Lexical Unit	Grand total
<i>Africa</i>	Kenyan	7	10	0	0	17
	Namibian	5	5	0	0	10
	Tanzanian	18	6	0	0	24
	Ugandan	3	10	0	0	13
<i>North America</i>	American	18	8	0	0	26
	Mexican	18	22	6	0	46
	Quebec	17	2	0	0	19
<i>Central America</i>	Panamanian	19	5	0	0	24
<i>South America</i>	Argentinean	14	5	0	0	19
	Brazilian	19	4	0	0	23
<i>Central Asia</i>	Afghan	10	13	2	0	25
	IPSL-Bangalore	3	10	0	0	13
	IPSL-Karachi	2	26	11	4	43
	Mongolian	7	6	0	0	13
	Nepali	0	52	4	2	58
	Tibetan	8	5	0	0	13
<i>Far East Asia</i>	Chinese	2	30	5	0	37
	Hong Kong	24	9	0	0	33
	Japanese	9	10	3	0	22
	Korean	24	7	0	0	31
<i>South East Asia</i>	Ho Chi Minh City	19	11	0	0	30
	Thai	11	11	0	0	22
<i>Middle East</i>	Israeli	7	5	0	0	12
	Persian	5	3	0	0	8
	Turkish	18	7	0	0	25
<i>Austronesia</i>	Australian	25	4	0	0	29

Macro-Geographical Region	Signed Language	1 Lexical Unit	2 Lexical Unit	3 Lexical Unit	4 Lexical Unit	Grand total
	New Zealand	21	7	1	0	29
<i>Europe</i>	British	12	3	0	0	15
	Bulgarian	2	17	6	0	25
	Croatian	2	4	0	0	6
	Danish	32	11	1	0	44
	Dutch	17	11	0	0	28
	Finnish	11	2	0	0	13
	French	13	5	0	0	18
	German	22	6	0	0	28
	Irish	16	0	0	0	16
	Italian	15	4	0	0	19
	Norwegian	19	4	0	0	23
	Russian	10	9	0	0	19
	Swedish	17	1	0	0	18
	Grand Total	521	370	39	6	936

Table F9

Overall distribution of person terms in parental, grandparental, and offspring terms

	Holistic		Phonological overlap		No phonological overlap		Count of all lexical items
<i>father</i> from <i>man</i>	6	11.1%	24	44.4%	24	44.4%	54
<i>mother</i> from <i>woman</i>	6	11.1%	13	24.1%	35	64.8%	54
<i>grandfather</i> from <i>man</i>	3	5.8%	13	25.0%	36	69.2%	52
<i>grandmother</i> from <i>woman</i>	5	9.4%	10	18.9%	38	71.7%	53
<i>son</i> from <i>boy</i> or <i>man</i>	15	42.9%	5	14.3%	15	42.9%	35
<i>daughter</i> from <i>girl</i> or <i>woman</i>	15	40.5%	4	10.8%	18	48.6%	37

Table F13

Distribution of terms for son and daughter; motivated by other semantic domains and person term

	<i>son</i>		<i>daughter</i>	
	<i>boy</i>	<i>man</i>	<i>girl</i>	<i>woman</i>
<i>baby</i>		IPSL-Karachi Mongolian Nepali		IPSL-Karachi Mongolian Nepali
<i>giving-birth</i>	Ugandan	Bulgarian Hong Kong IPSL-Bangalore	Ugandan	Bulgarian Hong Kong Israeli
<i>child: person-whose-height-is-short</i>	Kenyan Danish	Chinese Ho Chi Minh City Turkish	Kenyan	Chinese Ho Chi Minh City Turkish
<i>offspring</i>		Croatian		Croatian
<i>1p. possessive pronoun</i>		Afghan		Afghan

Table F14

Distribution of phonological overlap in parental, grandparental, and offspring terms

Phonological Overlap	Handshape		Location		Path Movement		Count of all lexical items	Count of distinct signed languages
	Ph. O.	None	Ph. O.	None	Ph. O.	None		
<i>father</i> from <i>man</i>	7	17	20	4	5	19	24	20
<i>mother</i> from <i>woman</i>	7	6	10	3	0	13	13	13
<i>grandfather</i> from <i>man</i>	5	8	10	3	2	11	13	9
<i>grandmother</i> from <i>woman</i>	6	4	7	3	0	10	10	7
<i>son</i> from <i>boy</i>	4	1	3	2	0	5	5	5
<i>daughter</i> from <i>girl</i>	3	1	2	2	0	4	4	4
Grand Total	32	37	52	17	7	62	69	24
Percentage	46%	54%	75%	25%	10%	90%	100%	

Table F15

Distribution of kin terms overlapped with an initialized handshape

Macro-Geographical Region	Signed Language	Total of Kin Terms with Initialized Handshape	Percentage of Kin Terms with Initialized Handshape	Total of Lexical Entries
<i>Africa</i>	Kenyan	1	5.9%	17
	Namibian	0	0%	10
	Tanzanian	5	20.8%	24
	Ugandan	7	53.8%	13
<i>North America</i>	American	11	42.3%	26
	Mexican	37	80.4%	46
	Quebec	7	36.8%	19
<i>Central America</i>	Panamanian	12	50.0%	24
<i>South America</i>	Argentinean	2	10.5%	19
	Brazilian	6	26.1%	23
<i>Central Asia</i>	Afghan	0	0%	25
	IPSL-Bangalore	0	0%	13
	IPSL-Karachi	0	0%	43
	Mongolian	2	15.4%	13
	Nepali	18	31.0%	58
	Tibetan	0	0%	13
<i>Far East Asia</i>	Chinese	24	64.9%	37
	Hong Kong	0	0%	33
	Japanese	0	0%	22
	Korean	0	0%	31
<i>South East Asia</i>	Ho Chi Minh City	0	0%	30
	Thai	13	59.1%	22
<i>Middle East</i>	Israeli	0	0%	12

Macro-Geographical Region	Signed Language	Total of Kin Terms with Initialized Handshape	Percentage of Kin Terms with Initialized Handshape	Total of Lexical Entries
	Persian	0	0%	8
	Turkish	2	8.0%	25
<i>Austronesia</i>	Australian	21	72.4%	29
	New Zealand	18	62.1%	29
<i>Europe</i>	British	7	46.7%	15
	Bulgarian	4	16.0%	25
	Croatian	0	0%	6
	Danish	12	27.3%	44
	Dutch	7	21.9%	32
	Finnish	0	0%	13
	French	9	50.0%	18
	German	2	7.1%	28
	Irish	15	93.8%	16
	Italian	5	26.3%	19
	Norwegian	1	4.3%	23
	Russian	0	0%	19
	Swedish	0	0%	18
	Grand Total	248	26.4%	940

Table F16

Distribution of initialized handshapes in kin terms categorized by lineal, collateral, and affinal relations

Macro-Geographical Region	Signed Language	Tokens of lineal terms	% of lineal terms	Tokens of collateral terms	% of collateral terms	Tokens of affinal terms	% of affinal terms	Total of initialized kin terms
<i>Africa</i>	Kenyan	0	0%	1	100%	0	0%	1
	Namibian	0	0%	0	0%	0	0%	0
	Tanzanian	1	20%	1	20%	2	40%	5
	Ugandan	4	57%	2	29%	0	0%	7
<i>North America</i>	American	0	0%	6	55%	4	36%	11
	Mexican	14	38%	6	16%	14	38%	37
	Quebec	0	0%	6	86%	0	0%	7
<i>Central America</i>	Panamanian	3	25%	3	25%	4	33%	12
<i>South America</i>	Argentinean	2	100%	0	0%	0	0%	2
	Brazilian	1	17%	0	0%	4	67%	6
<i>Central Asia</i>	Afghan	0	0%	0	0%	0	0%	0
	IPSL-Bangalore	0	0%	0	0%	0	0%	0
	IPSL-Karachi	0	0%	0	0%	0	0%	0
	Mongolian	0	0%	0	0%	0	0%	2
	Nepali	0	0%	6	33%	12	67%	18
	Tibetan	0	0%	0	0%	0	0%	0

Macro-Geographical Region	Signed Language	Tokens of lineal terms	% of lineal terms	Tokens of collateral terms	% of collateral terms	Tokens of affinal terms	% of affinal terms	Total of initialized kin terms
<i>Far East Asia</i>	Chinese	6	25%	14	58%	3	13%	24
	Hong Kong	0	0%	0	0%	0	0%	0
	Japanese	0	0%	0	0%	0	0%	0
	Korean	0	0%	0	0%	0	0%	0
<i>South East Asia</i>	Ho Chi Minh City	0	0%	0	0%	0	0%	0
	Thai	7	54%	5	38%	0	0%	13
<i>Middle East</i>	Israeli	0	0%	0	0%	0	0%	0
	Persian	0	0%	0	0%	0	0%	0
	Turkish	0	0%	0	0%	2	100%	2
<i>Austronesia</i>	Australian	12	57%	8	38%	0	0%	21
	New Zealand	0	56%	7	39%	0	0%	18
<i>Europe</i>	British	6	86%	1	14%	0	0%	7
	Bulgarian	0	0%	0	0%	4	100%	4
	Croatian	0	0%	0	0%	0	0%	0
	Danish	0	0%	10	83%	1	8%	12
	Dutch	3	43%	3	43%	0	0%	7
	Finnish	0	0%	0	0%	0	0%	0
	French	4	44%	5	56%	0	0%	9
	German	0	0%	0	0%	0	0%	2
	Irish	6	40%	5	33%	2*	13%	15

Macro-Geographical Region	Signed Language	Tokens of lineal terms	% of lineal terms	Tokens of collateral terms	% of collateral terms	Tokens of affinal terms	% of affinal terms	Total of initialized kin terms
	Italian	2	40%	1	20%	2	40%	5
	Norwegian	0	0%	0	0%	0	0%	1
	Russian	0	0%	0	0%	0	0%	0
	Swedish	0	0%	0	0%	0	0%	0
	Grand Total	81	32.6%	90	32.6%	54	21.8%	248

Note: The percentage calculated is based on the token count of lineal set divided by the total count of initialized kin terms reported in the signed language dictionary. This also applies for collateral and affinal sets.

Table F17

Distribution of kin terms expressed by two or one-manual alphabetic fingerspelling, hand-mouth system fingerspelling, and character writing in 40 signed languages

Macro-Geographical Region	Signed Language	One or Two manual alphabetic fingerspelling	Hand-mouth system fingerspelling	Character Writing	Counts of F.S./C.W.	Total of all kin terms reported
<i>Africa</i>					0	0
<i>North America</i>	American	<u>great grandfather</u> <u>great grandmother</u>			2	26
<i>Central America</i>					0	0
<i>South America</i>	Brazilian	<u>father</u> <u>grandparent</u>			2	23
<i>Central Asia</i>					0	0
<i>Far East Asia</i>	Chinese			<u>husband's father</u> <u>elder sister's husband</u>		37
	Korean		<u>uncle</u> <u>cousin</u>		2	31
<i>South East Asia</i>					0	0
<i>Middle East</i>					0	0

Macro-Geographical Region	Signed Language	One or Two manual alphabetic fingerspelling	Hand-mouth system fingerspelling	Character Writing	Counts of F.S./C.W.	Total of all kin terms reported
<i>Austronesia</i>	Australian	<i>son</i>			1	29
<i>Europe</i>	Danish		<i>father's sister</i>			
			<i>nephew</i>			
			<i>niece</i>			
			<i>brother-in-law</i>		4	44
	Grand Total					

Table F18

Kin types for father, mother, and parents in 40 signed languages

Macro-Geographical Region	Signed Language	<i>father</i>	<i>mother</i>	Compound of <i>father</i> and <i>mother</i>	Distinct form of parents	Type
<i>Africa</i>	Kenyan	X	X	unknown		Type 1
	Namibian	X	X	X*		Type 1
	Tanzanian	X	X		initialized handshake	Type 1
	Ugandan	X	X	unknown		Type 1
<i>North America</i>	American	X	X	X		Type 1
	Mexican	X	X	X		Type 1
	Quebec	X	X	X		Type 1
<i>Central America</i>	Panamanian	X	X	unknown		Type 1
<i>South America</i>	Argentinean	X	X		initialized handshake	Type 1
	Brazilian	X	X	unknown		Type 1
<i>Central Asia</i>	Afghan	X	X	X		Type 1
	IPSL-Bangalore		X	unknown		unknown
	IPSL-Karachi	X	X	X		Type 1
	Mongolian	X	X	unknown		Type 1
	Nepali	X	X	unknown		Type 1
	Tibetan	X	X	unknown		Type 1
<i>Far East Asia</i>	Chinese	X	X	unknown		Type 1
	Hong Kong	X	X	X		Type 1
	Japanese	X	X	X*		Type 1
	Korean	X	X	X*		Type 1
<i>South East Asia</i>	Ho Chi Minh City	X	X	unknown		Type 1
	Thai	X	X	unknown		Type 1

Macro-Geographical Region	Signed Language	<i>father</i>	<i>mother</i>	Compound of <i>father</i> and <i>mother</i>	Distinct form of parents	Type
<i>Middle East</i>	Israeli	X	X	X		Type 1
	Persian	X	X	unknown		Type 1
	Turkish	X	X	unknown		Type 1
<i>Austronesia</i>	Australian	X	X	X	initialized handshake*	Type 1
	New Zealand	X	X	X	initialized handshake*	Type 1
<i>Europe</i>	British	X	X	X	initialized handshake*	Type 1
	Bulgarian	X	X	X**		Type 1
	Croatian	X	X	unknown		Type 1
	Danish	X	X	X		Type 1
	Dutch	X	X	X		Type 1
	Finnish	X	X	X		Type 1
	French	X	X	X		Type 1
	German	X	X		X	Type 1
	Irish	X	X	X		Type 1
	Italian	X	X	X		Type 1
	Norwegian	X	X	X		Type 1
	Russian	X	X		X	Type 1
	Swedish	X	X	X		Type 1
	Total	39	40	X: 22; unknown: 15	distinct form: 2; initialized handshake: 5	Type 1: 39; unknown: 1

Table F19

Kin types of father, father's brother, and mother's brother in 40 signed languages

Macro-Geographical Region	Signed Language	Generational	Lineal	Bifurcate collateral	Bifurcate merging	Type
<i>Africa</i>	Kenyan		X			Type 2
	Namibian					unknown
	Tanzanian				X	Type 4
	Ugandan		X			Type 2
<i>North America</i>	American		X			Type 2
	Mexican		X			Type 2
	Quebec		X			Type 2
<i>Central America</i>	Panamanian		X*			Type 2
<i>South America</i>	Argentinean		X*			Type 2
	Brazilian		X*			Type 2
<i>Central Asia</i>	Afghan			X		Type 3
	IPSL-Bangalore		X			Type 2
	IPSL-Karachi			X		Type 3
	Mongolian					unknown
	Nepali			X		Type 3
	Tibetan			X		Type 3
<i>Far East Asia</i>	Chinese			X		Type 3
	Hong Kong					unknown
	Japanese		X			Type 2
	Korean		X			Type 2
<i>South East Asia</i>	Ho Chi Minh City			X		Type 3
	Thai			X		Type 3
<i>Middle East</i>	Israeli		X			Type 2

Macro-Geographical Region	Signed Language	Generational	Lineal	Bifurcate collateral	Bifurcate merging	Type
	Persian					unknown
	Turkish			X		Type 3
<i>Austronesia</i>	Australian		X			Type 2
	New Zealand		X			Type 2
<i>Europe</i>	British		X*			Type 2
	Bulgarian		X			Type 2
	Croatian					unknown
	Danish		X			Type 2
	Dutch		X			Type 2
	Finnish		X*			Type 2
	French		X			Type 2
	German		X			Type 2
	Irish		X			Type 2
	Italian		X*			Type 2
	Norwegian		X*			Type 2
	Russian		X			Type 2
	Swedish			X*		Type 3
	Total	0	25	9	1	5 unknown

APPENDIX G: DESCRIPTIVE ANALYSES OF KIN TERMS IN INDIVIDUAL SIGNED LANGUAGES

This section describes the general properties of kinship terminology in each signed language as many signed languages have not yet been described by formal analyses. Signed languages are categorized according to macro-geographic region.

APPENDIX G1: DESCRIPTION OF AFRICAN SIGNED LANGUAGES KIN TERMS

Kenyan Sign Language

Kenyan Sign Language's (KSL) reports 17 kin terms, and kin terms are primarily constructed based on person terms of *man*, *woman*, *boy*, and *girl*. Other lexemes realized in kin constructions map on to conceptual domains of *marry*, *child (person-whose-height-is-short)*, and *collateral kin (hand-moves-to-lower-backside)*.

The person terms of *woman* and *girl* both map to the iconic schema of a female breast. The form of *woman* realizes with a full flat handshape ('B') with an internal movement of wrist flick, moving up and down. The form of *girl* expresses with a closed fist, tapping on the breast. The semantic concept of *mother* may either be conveyed in two different lexical variants. The first variant holistically overlaps with the form of *woman*; illustrating the form of *woman* semantically extends to denote *mother*. The form of the second variant share the same flat, full handshape of a 'B' with the form of *woman*, while location differs where the variant situates on the cheek and *woman* on the ipsilateral chest.

The holistic form of *man* semantically extends to one lexical variant of *father*. The term of *boy* semantically extends to another variant of *father*; expressing as a holistic form to denote both *boy* and *father*. In contrast, the form *boy* overlaps with the form of *man* by location and movement, differentiating by handshape.

All three lexical variants of *father* overlap location of the chin while they differ in handshape and movement. Two lexical variants of *father* resemble in its phonological form in

location and two downward moments, but not handshape. One variant has an open ‘5’ hand on the chin, closing into a closed flat hand, which is also a person term of *man*. Another variant expresses an index finger, bending the index finger to touch the tip of the thumb that also refers to BOY. The third variant that does not overlap in movement like two other variants forms with an index finger, tapping sagittally on the chin. Unlike two variants of *father*, the third variant only refers to *father* and does not entail other referents of either *man* or *boy* unlike that seen in the two other lexical variants of *father*.

The form of *man* that also semantically extends to *father* constructs two kin terms: *husband* and *grandfather*. This pattern also applies to *wife* and *grandmother* with the term *woman* which also semantically extends to *mother*. The construction of *husband* sequentially expresses two lexemes: [*man/father*] [*marry*], which is also observed in *wife* with the form of *woman/mother*. Terms of *grandfather* and *grandmother* express with two lexemes in a sequence: [*hand-holding-a-stick*] [*man/woman*]; however, it is possible that the translation of grandparental terms may be more representative as *old father/mother* but would require consultation of Kenyan signers to verify this translation.

Out of thirteen kin terms, only three terms are expressed in one lexical form: *cousin* and one lexical variant of *mother* and *father*. Ten Kenyan kin terms constructs with two overt lexemes of either person or parental terms. Either person or parental term precedes another lexeme within a construction of a kin term. A description of ten Kenyan kin terms is given in Appendix G1 Table G1.

Table G1

Kenyan kin terms constructed with person and parental terms

Constructions of Kin Terms	<i>man/father</i>	<i>woman/mother</i>	<i>boy/father/ male</i>	<i>girl/female</i>
[gender] [<i>person-whose-height-is-short: child</i>]			<i>son</i>	<i>daughter</i>
[person term] [<i>marry</i>]	<i>husband</i>	<i>wife</i>		
[<i>hand-holding-stick</i>] [person term]	<i>grandfather</i>	<i>grandmother</i>		
[gender] [<i>same</i>]			<i>brother</i>	<i>sister</i>
[gender] [<i>hand-to-lower-backside</i>]			<i>uncle</i>	<i>aunt</i>

The paradigm of Kenyan kin terms demonstrates ten kin terms constructed of two overt lexemes, containing a person term positioned first within the construction except for grandparental terms. The spousal kin terms contain the parental term positioned first within the construction while second ascending lineal kin terms of *grandfather* and *grandmother* reverse the realization of parental term in the final position in the construction.

The term *girl* constructs kin terms of *daughter*, *sister*, and *aunt*. Based on the pattern of female kin terms, the form *girl* denotes a generic form for *female*. This pattern is also observed in male kin terms constructed of the term *boy*; illustrated in the terms *son*, *brother*, and *uncle*. Similar to the term *girl*, *boy* functions as a generic referent of *male*. Based on the pattern of kin constructions, both terms of *boy* and *girl* do not specify the semantic property of *young*, but instead entail the property of gender. In contrast, constructions of terms glossed as *man* and

woman appear to specify more by encoding both semantic properties of gender and adulthood compared to those terms encoding only gender glossed as *boy (male)* and *girl (female)*.

Unlike other kin terms, three forms: *mother*, *cousin*, and *family* do not derive from any person terms nor do they derive any phonological features that encode gender. *Mother* forms a distinct sign independently from any person term; realized by a full hand tapping twice on the cheek of the face. *Cousin* is formed with an initialized handshape of ‘C’ situated in neutral space; suggesting the kin term is marked due to the presence of initialization and is gender neutral. The term for *family* exploits an image schema of a circle located in neutral space, but doesn’t overlap with an initialized handshape.

Most Kenyan kin terms are productively constructed by person terms. While person terms of *boy/father/male* and *girl/female* marks gender in kin terms, the pattern of Kenyan kin terms suggests the exploitation of gender may experience an emergent function of gender marking in Kenyan Sign Language. All kin terms contain a salient reference to gender expressed with a person term except for *mother*, *cousin*, and *family* which do not overlap any phonological structure observed in Kenyan female and male kin terms.

Namibian Sign Language

Namibian Sign Language included 10 identifiable kin terms with patterns revealing that four person terms provided the motivation for them. The exploitation of the person terms' location suggests that gender marking is salient in Namibian Sign Language.

Of the fifteen kin terms, person terms provide the foundation for ten of them. The location of a person term indicates gender marking. Situating the hand on the contralateral breast denotes female while the ipsilateral breast refers to male. The handshape of person terms discriminates between adult and young referents. Producing a closed fist marks either an adult female, *woman*, or an adult male, *man*, while a bent index finger denotes a young female, *girl*, or a young male, *boy*. Namibian reports two lexical variations of *man*, glossed as OMULUMEHNU, OMUSAMANE. OMUSAMANE 'man' does not contain any phonological overlap with OMULUMEHNU 'man', suggesting that OMUSAMANE 'man' construes differently than the form of OMULUMEHNU denoting *man/father/husband*.⁷³ Except for OMUSAMANE 'man', the descriptions of four other person terms reveal similar phonological structures, but location and handshape differentiate them.

The lexical entry for *woman* represents three different referents: *woman*, *mother*, and *wife*. Similar to the lexical entry of *woman*, the form of *man* semantically extends to include the two referents, *father* and *husband*. According to the Namibian Sign Language dictionary, person

⁷³ The sign of OMUSAMANE 'man' is expressed with an index finger situated on chin, moving to neutral space with an arc.

terms also motivate constructions of the formal signs denoting *wife* and *husband*, *wife* and *husband*. Both spousal terms realize the person term, either *woman* or *man*, in the initial position of the construction, while the final position conveys another conceptual domain, the reference to *marry*. The formal signs for spousal kin terms are constructed [*woman/man*] [*marry*⁷⁴]. However, the Namibian dictionary does not explain the differences in semantic or pragmatic use between two forms of *wife* and *husband*.

Another kin term derived from *woman* is *grandmother*, where the closed fist of the dominant hand rests on the contralateral breast with the non-dominant hand clasping over the dominant fist. Identical to the phonological structure of *grandmother*, the form of *grandfather* is located on the ipsilateral area with the non-dominant hand clasping on the dominant fist. Before determining that the function of the non-dominant hand clasping over the dominant fist marks second descending kin terms, another lexical entry representing *parents* provides more clues about the function of the hand clasp. Similar to the forms of *grandmother* and *grandfather*, the form of *parents* depicts a non-dominant hand clasp situated center between breasts. This pattern suggests that the phonological structure of a hand clasp may denote a joint (paternal) relationship between a man and a female who have borne their offspring, referring to first and second ascending lineal kin terms. Also, location in this form refers to a specific gender to differentiate between *woman/mother/wife* and *man/father/husband*.

⁷⁴ According to the Namibian dictionary, there is no lexical entry for *marry*.

The Namibian dictionary provides three lexical entries for *brother*, *sister*, and *brother/sister*. The construction of *brother* is realized with a dominant index finger on the ipsilateral chest while the non-dominant fist locates on the belly. Similar to the construction of *brother*, *sister* exploits the contralateral chest to denote female sibling. The collateral kin term of *brothers-and-sisters* is realized by the dominant hand moving straight up from the wrist to the upper arm of the non-dominant arm. *Sister* and *brother* are expressed by two lexical units indicating a person term in initial position and a term denoting *sibling* positioned finally, where the dominant hand moves up straight from the non-dominant wrist to forearm. Appendix G1 Table G2 shows a paradigmatic pattern of Namibian kin terms, demonstrating constructions based on lateralization on the chest:

Table G2

Namibian kin term construction with respect to lateralization on the chest

	Ipsilateral	Contralateral	Center
<i>one-handed fist</i>	TATE, OMULUMENHU OMULUMEHNU A HOMBOLA (<i>man, father, husband</i>)	MEME, OMUKULUKADI, OMUKULUKADI A HOMBOLWA { <i>woman, mother, wife</i> }	
<i>two-handed fist</i>	TATE KULU A DALA TATE ILE MEME (<i>grandfather</i>)	MEEKULU A DALA MEME IL TATE (<i>grandmother</i>)	OONAKUDALA, OONAKUVALA (<i>parents</i>)
<i>Index finger (dominant) with fist located on the belly</i>	OKAMATI (<i>boy</i>)	OKAKADONO (<i>girl</i>)	
<i>[Index finger (dominant)] [sibling]</i>	OMUMWAMEME MATI (<i>brother: [boy] [sibling]</i>)	OMUMWAMEME KADONA (<i>sister: [girl] [sibling]</i>)	

Although there is no lexical entry for the first descending lineal kin terms of *daughter* and *son* in the Namibian Sign Language dictionary, there are two patterns that predict the forms of *daughter* and *son* are exploited from person terms of *girl* and *boy*. The first pattern shows that parental kin terms are semantically derived from person terms of *woman* and *man*. Based on the first pattern, person terms of *girl* and *boy* construct the forms of *sister* and *brother*. These two patterns provide plausible predictions of the forms of offspring terms in Namibian Sign Language.

All thirteen kin terms are constructed from person terms except for the two signs: a collective term for *brothers-and-sisters* and *extended family/relatives*. The form of *extended family/relatives* exploits an image schema of a family being enclosed into a circular form. Person terms encode salient reference to gender, differentiated by location of lateralization on the chest. Within the category of person terms, the function of handshape marks the distinction between young and adult persons. Person terms also function as a gradual grammaticalization of gender marking.

Tanzanian Sign Language

Tanzanian Sign Language's (Lugha Ya Alama Ya Tanzania; LAT) kinship terminology is based on a different kinship system than that observed in American and European signed languages. According to 25 reported kin terms in the LAT dictionary, LAT generally constructs kin terms based on the person terms: *man* and *woman*. Few kin terms do not contain signs of *man* or *woman*. A description of male kin terms is given in Appendix G1 Table G3.

Table G3

Male kin terms in Tanzanian Sign Language

Male kin term	Swahili	<i>man</i> (same form)	Lexical unit
<i>man</i>	MWANAMUME	<i>man</i>	
<i>boy</i>	MVULANA⊕	<i>man</i> -(baby G handshape)	
<i>father</i>	BABA⊕	<i>man</i>	
<i>husband</i>	MUME⊕	<i>man</i> -1-movement	
<i>younger paternal uncle</i>	BABAMDOGO⊕	<i>man</i>	<i>younger</i>
<i>elder paternal uncle</i>	BABAMKUBWA⊕	<i>man</i>	<i>elder</i>
<i>father-in-law</i>	BABAMKWE⊕	<i>man</i>	<i>hands-clasp-together</i> : Unknown translation
<i>grandfather</i>	BABU	(different form: <i>form of hat</i>)	<i>hand-holding-a-stick</i> : <i>elder, elder person</i>
<i>brother</i>	KAKA	K-initialized-(same-location and movement as mother)	
<i>maternal uncle</i>	MJOMBA	(different form)	
<i>brother-in-law</i>	SHEMEJI	<i>man</i>	

Five out of nine male kin are expressed in a singular holistic form. Signs for *father* and *brother-in-law* are similar to *man*. While the terms of *man* and *husband* are similar in form, they differ by movement. *Husband* is expressed with one straight movement, and *man* with two straight movements. Comparing the form of *man* to the form of *husband* illustrates a phonological reduction in movement; indicating that *husband* is grammaticalized from the form of *man*. Two other forms: *brother* and *maternal uncle*, differ by having no phonological overlap with the term of *man*. Important to note, the form of KAKA ‘brother’ is similar to *mother* with an initialized K handshape. The term of *maternal uncle* is realized with a hand moving up in an arc from the inside of the elbow to the forearm, illustrating a form distinct from all other paternal kin terms.

As for other four male kin: *elder brother*, *younger brother*, *father-in-law*, and *grandfather* are expressed sequentially with two overt lexemes. The first three male kin contain the term of *man* positioned first within the construction. *Grandfather* has a different form (appears to be *form of hat*) rather than *man* in the first position which is used before the second sign: *elder*; *elder person*.

There is no lexical entry for *son* in the LAT dictionary, but an entry for *boy* illustrates similar phonological structure to *man*, except for a slightly different handshape than that seen in *man*. According to the LAT dictionary, *daughter* shares the same form as *girl*. *Son* can be predicted (but not concluded) to share the same form as *boy* based on description of person terms.

Lexical entries in the LAT dictionary show eight distinct female kin terms. Five female kin terms locate in the breast area, similar to the expression of the form of *woman*. Within the given set of female kin terms, more phonological and morphological variation exists than in male kin terms, as displayed in Appendix G1 Table G3. No female kin terms share the same form of *woman*, but five terms share the same location as *woman*. Three female kin terms share the same location and handshape of *woman* with differences being manifested in movement. *Wife* and *sister-in-law* share the same signed form, while *lady's sister-in-law*, and *sister*, *aunt* and *daughter/girl* have different handshapes and movement than does *woman*. The form of *aunt* is expressed with a claw handshape and one straight movement. The form of *daughter/girl* includes an index handshape and is static – without movement. Appendix G1 Table G4 describes how female kin terms are constructed.

Table G4

Female kin terms in Tanzanian Sign Language

Female kin term	Swahili	<i>female</i> (same form)	Lexical unit
<i>woman</i>	MWANAMKE	<i>female</i> -S (1 arc movement)	
<i>girl; daughter</i>	MSICHANA	<i>female</i> -index-finger (stative)	
<i>wife</i>	MKE	<i>female</i> -S (1 straight movement)	
<i>sister in law</i>	SHEMEJI	<i>female</i> -S (1 straight movement)	
<i>lady's sister in law</i>	WIFI	<i>female</i> -S (1 straight movement: diagonal)	
<i>sister</i>	DADA	<i>female</i> -S (2 straight movement)	
<i>aunt</i>	SHANGAZI	<i>female</i> -claw-hand (1 straight movement)	
<i>mother</i>	MAMA	index-finger-on-cheek	
<i>maternal aunt (younger than one's mother)</i>	MAMA MDOGO	index-finger-on-cheek	<i>younger</i>
<i>stepmother</i>	MAMA WA KAMBO	index-finger-on-cheek	K-initialized: 'step'

Mother, *younger maternal aunt*, and *stepmother* share the same form as *mother* which is distinct from the form *woman*. *Younger maternal aunt* are realized by two lexemes sequentially: [*mother*] [*younger*]. This construction is also observed in *elder/younger paternal uncle* using a similar construction: [*father/man*] [age of referent]. This behavior suggests that LAT does not draw distinction among collateral kin (mother and mother's sisters; father and father's brothers) except for the overt form of *younger* or *elder* when positioned after *mother* or *father*.

Two lexemes sequentially realize MAMA WA KAMBO ‘stepmother’: [*mother*] [*K-initialized form*]. The initialized handshape is marked and located in gender neutral space. The co-articulation of initialized handshape and neutral space appears to be more marked as observed in the following kin terms: MAMA WA KAMBO ‘stepmother’ with a ‘K’ initialized handshape, BINAMU ‘cousin’ with a ‘B’ initialized handshape, and MKWE ‘in-law’ with a ‘M’ initialized handshape. This finding suggests that both the realization of initialized handshape and neutral space indicate markedness.

Person terms provide the foundation for most Tanzanian kin terms. Person terms embed the semantic property of gender; but, are not grammaticalized enough to determine gender marking in Tanzanian’s kinship terminology. While some Tanzanian kin terms provide a salient reference to gender, six kin terms contain no reference to gender. These gender-neutral terms, *cousin*, *grandchild*, *parents*, *family*, and two lexical variants of *relatives*, do not share the phonological structure seen in Tanzanian male and female kin terms. The terms of *grandchild* and two lexical variants of *relatives* appear to be motivated by different domains such as *holding-a-baby-in-arms* for *grandchild* and the conceptualization of *same* drives the constructions of *relatives*.⁷⁵ The construction of *family* maps to a metaphorical schema of a

⁷⁵ Both terms of JAMAA ‘relatives’ and NDUGU ‘relatives’ appear to share a similar semantic connotation of *same*. While JAMAA ‘relatives’ forms with a trilled, spread index and middle fingers (‘V’ handshape) situated in neutral space, the form of NDUGU ‘relatives’ expresses with both index fingers tapping on their radial sides of the finger in neutral space.

circle, denoting the conceptual domain that kin members are encircled into one unified group. The form of *parents* is distinct unlike most constructions of *parents* as a compound of *father* and *mother* in other signed languages. Constructions of Tanzanian kin terms demonstrate a variety of motivations among different conceptual domains and linguistic economy by incorporating initialized handshapes.

After examining the 25 kin terms reported in LAT dictionary, the dictionary organizes based on Swahili terminology that affects some signed kin terms to be redundant. Thus LAT kin terms are re-counted to portray distinct forms: 18 kin terms and 4 person terms, in Tanzanian Sign Language.

Ugandan Sign Language

Most of the 13 kin terms in Ugandan Sign Language (USL) contain four person terms of *man*, *woman*, *boy*, and *girl*. Ugandan kin terms are expressed sequentially in constructions of two lexical units where another lexical unit follows a person term.

The patterns that emerge in constructing Ugandan kin terms are illustrated in Appendix G1 Table G5.

Table G5

Ugandan kin term construction

	<i>giving-birth</i>	<i>marry</i>	<i>old</i>	<i>carried-on-the-back-of-mother</i>
<i>man</i> (handshape of S)	<i>father</i>	<i>husband</i>	<i>grandfather</i>	
<i>woman</i>	<i>mother</i>	<i>wife</i>	<i>grandmother</i>	
<i>boy</i>	<i>brother</i>			<i>son</i>
<i>girl</i>	<i>sister</i>			<i>daughter</i>

Within the paradigm, there are ten kin terms constructed of two overt lexemes, containing a person term positioned first within the construction. Nuclear kin terms of *father*, *mother*, *son*, and *daughter* are constructed from a person term and a lexical unit denoting *giving-birth*. The unit *giving-birth* derives from the iconic representation of giving birth. Although mothers are the ones who give birth, the construction semantically extends to other nuclear kin members of *father*, *brother*, and *sister* as illustrated by the paradigm.

The form of *woman* constructs first and second ascending female kin terms from *mother* and *grandmother* and a female spousal term of *wife*. This finding illustrates that these female kin terms derive semantically from the form of *woman*. Similar to female kin terms, male kin terms of *father*, *husband*, and *grandfather* derive from the form of *man*. The signs referring to spouses, *husband* and *wife*, consist of two lexemes with a person term and the semantic domain of *marry*: [man/woman] [marry]. Second ascending kin terms consist of a person term and the lexical unit of *old*: [man/woman] [old] construct *grandfather* and *grandmother*. According to the paradigm, person terms are productive in the construction of Ugandan kin terms.

Although the person term of *man* is expressed in male ascending and spousal kin terms of *father*, *husband*, and *grandfather*, the form in these three male kin terms differs by handshape. The handshape of *man* consists of an index finger and the thumb pinched together, while the handshape of the three male kin terms is a closed fist, ‘S’ handshape. The two possible explanations that could account for the change in handshape in these three kin terms are linguistic economy or semantic bleaching. In the case of *grandfather* [man] [old], the handshape conveyed in *old* is a closed fist, phonologically assimilated on to the preceding form of *man*. However, handshape assimilation from the second lexical unit to first lexical unit is not seen in *father*: [man] [giving-birth] and *husband*: [man] [marry], because the handshapes of lexemes in the final position are ‘B’ and ‘C’. Therefore phonological economy may not entirely account for the change in handshape observed in these male kin terms.

The change in handshape in lexicalized constructions suggests semantic bleaching, showing the phonological shape underwent lexicalization gradually in various stages dependent on other lexical units within the construction. A change in the phonological structure of *man* within constructions suggests semantic bleaching, indicating that the phonological structure of *man* lexicalized further to form *father*, *husband*, and *grandfather*. These kin terms represent predictably high-frequent lexicon that experienced lexicalization with respect to semantic bleaching and increased degrees of generalization extensions on types combined with lexical morphemes.

In contrast to the previous sets of kin terms, there are other two male and two female kin terms: *son*, *uncle*, *daughter*, and *aunt* that do not share any phonological overlap with the person terms *man* and *woman*. The first descending kin terms *son* and *daughter* are constructed of two lexical units: [*boy/girl*] [*carried-on-back-of-mother*]. The semantic domain of *carried-on-back-of-mother* clearly illustrates the cultural-specific motivation of young children being carried on the back of their mothers which would not be quickly understood among Western societies due to different cultural behaviors. Ugandan Sign Language presents *son* and *daughter* constructed of a different conceptual domain other than those similar to *giving-birth*, *baby-held-in-arms* and *person-whose-height-is-short* observed in some other signed languages. The handshapes for *boy* and *girl* are initialized ‘B’ and ‘G’, based on British Sign Language two-manual alphabet,

suggesting that British Sign Language influenced Ugandan Sign Language at some time from during its linguistic history.⁷⁶

Only three kin terms, *aunt*, *uncle* and *family*, do not contain person terms or other lexical units previously discussed. *Family* exploits a schematicized image of a circle overlapped with an ‘F’ initialized handshape, depicting the conceptual domain of kin members enclosed together as a group. As for both non-nuclear kin terms, *aunt* and *uncle* are phonologically realized with an initialized handshape of ‘A/U’, tapping on the ipsilateral shoulder. Comparing the initialized handshape of ‘A/U’ with the initialized handshape of ‘B/G’ seen in *boy* and *girl*, ‘A’/‘U’ handshapes do not derive from British Sign Language manual alphabet, suggesting that the constructions of *aunt* and *uncle* occurred at a different time that the constructions of *boy* and *girl*. Also, this observation reinforces the probability that Ugandan Sign Language experienced external influences of other signed languages.⁷⁷

Most of Ugandan kin terms are based on person terms, grounding the motivation of kinship lexicon in Ugandan Sign Language. Even though person terms encode gender, this

⁷⁶ Uganda was under British occupation from 1888-1962 (Mukherjee, 1985).

⁷⁷ The Ugandan forms of *aunt* and *uncle* resemble similar to one set of lexical variation in Danish. These forms are situated on the clavicle with two tap movements, but they differ with an overlap of an initialized handshape (Ugandan: ‘A’ for ‘aunt’, ‘U’ for ‘uncle’; Danish: ‘T’ for TANTE ‘aunt’, ‘O’ for ONKEL ‘uncle’). The similarity in phonological form may be accounted either by chance or historical relationship as it is constructed in more of an arbitrary form rather than motivated.

determination remains inconclusive as to whether person terms grammaticalized as gender marking or indicate of an emergent function of gender marking in kinship terminology of Ugandan Sign Language. Most Ugandan kin terms include a salient reference to gender overlapped with other semantic domains; however, only two gender neutral kin terms, *aunt* and *uncle*, do not overlap any other phonological structure seen in Ugandan male and female kin terms.

APPENDIX G2: DESCRIPTION OF NORTH AMERICAN SIGNED LANGUAGES KIN

TERMS

American Sign Language

American Sign Language (ASL) includes 26 identifiable kin terms. The motivation of American marking masculine appears in *man* and *boy* in the forehead area, while signs marking feminine appear in *woman* and *girl* in the lower facial/chin area. Gender motivation appears to share semantic domains of person terms: *man*, *boy*, *woman*, and *girl*. As there are two lexical variation of *man*, they overlap by location on the forehead. One variant of *man* is identical to *woman* in all phonological parameters except for initial position (*man*: forehead, *woman*: chin). Another variant of *man* appears to be schematicized by the folk etymology of a men's hat. Frishberg (1975) describes this linguistic phenomenon as the morphological preservation of male-female distinction within a class of signs (Frishberg 1975, p. 714).

The interaction of handshape and movement in American kinship terminology appears to be motivated by two kin types. The first kin type concerns first and second ascending lineal kin identified as: *mother*, *father*, *grandmother*, and *grandfather*. Overlapping phonological structures reveal two shared semantic properties indicating first and second ascending lineal kin; also semantically derived from the terms *woman* and *man*. The first phonological structure marking ascending lineal kin adopts a handshape of spread '5' fingers within the category of American kin terms. Second, the type of movement discriminates between first and second ascending lineal kin with two different types of movements. First ascending lineal kin (parental terms) are

expressed with two short taps at given locations. Second ascending lineal kin (grandparental terms) are realized with two arcs moving linearly away from given locations. Both spread '5' fingers and movement refer to and discriminate between first and second ascending lineal kin. The '5' handshape is also manifested in the form of *parents* as a compound of *mother* and *father* although the movement is changed by an arc integrating the initial location on the chin (*mother*) and the final location on the forehead (*father*).⁷⁸

The second kin type concerns kin terms outside of immediate nuclear kin include: *aunt*, *uncle*, *niece*, *nephew*, *cousin-feminine*, and *cousin-masculine*. Initialized American handshapes express 'A', 'U', 'N', and 'C' respectively; clearly indicating a marked category for non-nuclear kin relations. Also, these non-nuclear kin terms include with a marked movement of either circular or internal wrist movement⁷⁹, which differs from nuclear kin's movements of either taps or movement along a straight path. Similar to these kin terms overlapped with initialized handshapes, one kin term, *family*, convey an initialized handshape of 'F' but do not mark gender as it maps to a different conceptual domain portraying kin members enclosed into a circle. The

⁷⁸ The initiation of realizing the form of *parents* appears to be reversible; either begins at the forehead or the chin. The initiation of location of *parents* may be determined by the location of signs preceded to *parents* and/or stylistic.

⁷⁹ Both circular or internal wrist movements are stylistic according to individual preference of signing *aunt*, *uncle*, *cousin-masculine*, and *cousin-feminine*.

existence of initialized handshapes demonstrates a productive process to construct kin terms in American Sign Language.

Another category illustrates the relationship between phonological structures used to mark gender in American kin terms: *wife*, *husband*, *daughter*, *son*, *sister*, and *brother* whose construction includes the lexicalized combination of two units. Literature on the historical linguistic analysis of these kin terms describes them as compounds that became lexicalized into a single lexical unit through a process of phonological reduction (Frishberg 1975, Woodward 1973.) According to current analysis, gender marking prevails in these kin terms:

- *wife* and *husband* constructed of [gender + *marry*]
- *daughter* and *son* constructed of [gender + *baby*]
- *sister* and *brother* constructed of [gender + *same*]

Gender remains salient and pervasive in most American kin terms overlapped with other semantic domains, where forehead marks masculine while lower facial area marks feminine. Collateral kin terms all overlap with initialized handshapes; indicating this set of terms is a marked category in American Sign Language.

Mexican Sign Language

The 46 kin terms reported in Mexican Sign Language (Lengua de Señas Mexicana, LSM) are motivated by types of movement, contain feminine marking, and are discriminated by initialized handshapes.⁸⁰ Mexican kin terms do not derive from person terms as there is no evidence of any phonological overlap of person terms in any kin terms reported in the dictionary. Nearly all kin terms realize in neutral space except for six kin terms. First ascending lineal kin terms of *mother*, *father*, and one lexical variant of *parents* touch on the face.⁸¹ First descending lineal kin terms of *son* and *daughter* are realized on the contralateral clavicle in the initial position of the construction, moving away to neutral space in the final position.

Influenced by Spanish orthographic forms, kin terms map onto initialized handshapes based on LSM manual alphabet. For example, the form of FAMILIA ‘family’ incorporates an initialized handshape of ‘F’.⁸² If kin terms express multi-morphemic units similar to Spanish kin terms, then the form expresses each morphemic unit with an initialized handshape. Observe the

⁸⁰ Many feminine markings associated to kin terms are typically not included, and if the signer wants to specify female members, then will express an overt feminine marking (Martina Carlson, personal communication).

⁸¹ The form PADRES-1 ‘parents’ is one of two lexical variants reported in LSM dictionary, and the formation of PADRES-1 sequentially expresses both forms of PAPA ‘father’ and MAMA ‘mother’ respectively.

⁸² The form of FAMILIA ‘family’ realizes with a dominant handshape of ‘F’ moving straight from the inner elbow to the wrist of the non-dominant forearm. The Mexican form of *family* is different from most other signed languages where *family* maps to a metaphorical schema of a circle, denoting family members are enclosed into a group by kin relation.

example of BISABUELO ‘great-grandfather’, the form conveys two morphemic units in sequence, expressed with initialized handshapes of ‘B’ and ‘A’ to represent BIS ‘great’ and ABUELO ‘grandfather’. Furthermore, the forms of BIS ‘great’ and ABUELO ‘grandfather’ share the same phonological structures except for initialized handshapes. The form of ABUELO ‘grandfather’ may function as a singular lexical unit, while BIS ‘great’ functions as a bound morpheme realized prior to other lexical units within the construction of the kin term. Both hands produce the forms of BIS ‘great’ and ABUELO ‘grandfather’ where the non-dominant closed fist remains stative in neutral space while the wrist of the dominant handshape of ‘B’ or ‘A’ taps twice on the non-dominant hand. The similarity in phonological structures of BIS ‘great’ and ABUELO ‘grandfather’ suggests both forms share a semantic domain. In contrast, the construction of BISNIETO ‘great grandson’ formed sequentially with two overt lexemes: [BIS: *great*] [NIETO: *grandson*] illustrates the phonological structure of *grandson* is formed differently than *grandfather*. Comparing both constructions indicate that the phonological structure of *great grandson* does not overlap with the phonological structure of BIS ‘great’ further reinforcing that the form of BIS ‘great’ shares the same semantic domain as ABUELO ‘grandfather’.

Out of 46 LSM kin terms, six do not include initialized handshapes. These forms are: *brother*, *sister*, *daughter*, *son*, *stepdaughter*, *stepson*, and *half-brother*. These sibling and offspring kin terms illustrate motivation based on different conceptual domains. Initialized handshapes do not discriminate these kin terms unlike in other Mexican kin terms. The Mexican

kin terms motivated by Spanish orthographic forms do exploit initialized handshapes which are very productive in constructing LSM kin terms.

Both male kin term and female kin terms display similar construction; however, an overt lexical unit marks the gender of female kin terms, following the construction of the kin term. For example, the form of *sister* expresses two morphological components: [*brother*] [*feminine*], and this is also observed in *daughter*: [*son*] [*feminine*]. The sign of *wife* maps on the conceptual domain of *marry* and exploits the feminine marking, constructing [*marry*] [*feminine*]. Not only female kin terms but also a female person term of *girl* incorporates feminine marking. To differentiate two person terms of *boy* and *girl*, *girl* is produced with [*boy*] [*feminine-marking*]. The feminine marking is very productive in nearly all female kin terms in Mexican Sign Language.

Five female kin terms do not include a feminine marking, but the pattern of incorporating feminine marking appears to be influenced by the Spanish feminine marking of [-a].⁸³ Observe the example contrasting between the kin terms of NUERA ‘sister-in-law’ and YERNO ‘brother-in-law’, both forms share a similar phonological structure except for different initialized handshape of ‘N’ and ‘Y’. In the case of *daughter-in-law*, it does not express the feminine marking unlike seen in Mexican female kin terms except for *mother* and *stepmother*. Mapping an

⁸³ Five constructions that do not convey a feminine marking in Mexican female kin terms: MADRE ‘mother’, MAMA ‘mother’, MADRASTRA-1 ‘stepmother’, MADRASTRA-2 ‘stepmother’, and NUERA ‘daughter-in-law’.

initialized handshape to discriminate between two kin terms is also similar seen in MAMA ‘mother’ and MADRE ‘mother’ compared with PAPA ‘father’ and PADRE ‘father’. This behavior of contrasting kin terms by gender is rooted to Spanish kinship terminology may explain why the form of *daughter-in-law* does not exploit feminine marking as the form does not contain the overt morpheme of feminine marking seen in other female kin terms.⁸⁴ This behavior suggests female kin terms are derived from the domain of male kin terms that has a zero-morpheme masculine marking.

LSM exploits movement to differentiate kin terms, categorizing them into five sets. All LSM kin terms discussed are produced as two-handed signs in neutral space. Most handshapes are initialized according to LSM manual handshapes of Spanish orthographic forms, and also contain the feminine marking. The first set consists of sibling terms of *brother* and *sister*, realizing both index fingers hands rubbing, alternating in a straight, sagittal movement.

The second set moves both hands (with initialized handshapes) straight and horizontally where the hands finally touch in the center of the neutral space as repeated twice (tap movement). The second type of movement produces collateral, ascending (*aunt/uncle*) and

⁸⁴ In Spanish, *nuera* ‘daughter-in-law’ contains a morpheme of [-a] functioning as a feminine marking; however, the form of *nuera* ‘daughter-in-law’ appears to be distinct compared to the form of *yerno* ‘son-in-law’, which is also observed in LSM’s constructions of NUERA ‘daughter-in-law’ and YERNO ‘son-in-law’ as they do not share the same initialized handshape (‘N’ and ‘Y’). This particular linguistic behavior presents one plausible evidence that LSM appears to be sensitive to patterns of Spanish kinship terminology.

second descending kin terms of *cousin-feminine*, *cousin-masculine*, *aunt*, *uncle*, *granddaughter*, and *grandson*.

Similar to the second set, the third set concerns collateral kin terms of *niece* and *nephew*, expressed with both hands in horizontal, trilled movement with no manual contact. The fact there is no manual contact in the third set, contrasting with the second set where the hands do experience manual contact by tap movement.

The fourth set moves hands from the centralized neutral space, down and ipsilaterally with an arc and a change in palm orientation due to a twist in wrists. The fourth set marks affinal and second descending kin terms, referring to CONCUÑA ‘sister-in-law’, CONCUÑO ‘brother-in-law’, CONSUEGRA ‘mother-in-law’, CONSUEGRO ‘father-in-law’, CUÑADA ‘sister-in-law’, CUÑADO ‘brother-in-law’, NUERA ‘daughter-in-law’, YERNO ‘son-in-law’, BISNIETA ‘great-granddaughter’, and BISNIETO ‘great-grandson’.

The fifth set uses a sagittal arc, constructing two affinal terms of SUEGRA ‘mother-in-law’ and SUEGRO ‘father-in-law’. The types of movement are categorized as in Appendix G2 Table G6:

Table G6

Types of movements in kin terms in Mexican Sign Language

Types	Kin Term	Straight Movement	Arc Movement
Type 1	Co-lineal (HERMANA 'sister' and HERMANO 'brother')	Sagittal, Alternating	
Type 2	Collateral (PRIMA 'cousin-feminine', PRIMO 'cousin-masculine', TIA 'aunt', TIO 'uncle')	Horizontal, Bidirectional	
	Second descending kin terms (NIETA 'granddaughter', NIETO 'grandson')		
Type 3	Collateral (SORBINA 'niece', SOBRINO 'nephew')	Horizontal, Trilled	
Type 4	Affinal (CONCUÑA 'sister-in-law', CONCUÑO 'brother-in-law', CONSUEGRA 'mother-in-law', CONSUEGRO 'father-in-law', CUÑADA 'sister-in-law', CUÑADO 'brother-in-law', NUERA 'daughter-in-law', YERNO 'son-in-law')		Moving down, Ipsilateral
	Third descending kin terms (BISNIETA 'great-granddaughter', and BISNIETO 'great-grandson')		
Type 5	Affinal (SUEGRA 'mother-in-law', SUEGRO 'father-in-law')		Moving down, Sagittal

Comparing types of movement in the five sets, arc movement indicates affinal kin members while straight movement implies consanguineal kin members. However, within the set of affinal terms, the direction of arc movement specifies types of affinal kin. SUEGRA 'mother-in-law' and SUEGRO 'father-in-law' both move sagittally while other affinal terms move ipsilaterally. Also, straight movement marks once-removed relations in ascending, second descending, and collateral relations compared to an arc marking affinal and third descending kin

terms. Within the set of straight movements, the directionality of the movement differentiates among kin terms: sagittal specifies sibling, horizontal specifies non-nuclear but not affinal kin, and trilled specifies *nephew* and *niece*.⁸⁵ Patterns reveal types of movements, differentiating among sets of kin terms.

Based on patterns observed, kin terms are not constructed of person terms in LSM. Types of movement, initialized handshapes, and feminine marking productively motivate the kinship terminology of Mexican Sign Language.

⁸⁵ Within the sets of Type 2 and Type 3 movements, they differ in palm orientation. Palm orientation in Type 2 terms faces down while Type 3 terms orientates the palm away from the signer.

Quebec Sign Language

In Quebec Sign Language (Langue des Signes Québécoise, LSQ), there are 19 kin terms identified. Quebec kin terms appear to be motivated by sharing semantic domains of person terms: *woman* and *man*. LSQ does not discriminate between age of person terms: *woman* and *girl*; *man* and *boy*. The location of person terms constructs gender marking. Feminine marking is expressed on the lower facial area, while the forehead area marks masculine.

In Quebec kinship terminology, the interaction of handshape and movement are motivated by two kin types. The first kin type concerns the phonological structure of both spread ‘5’ fingers and movement; referring and differentiating between first and second ascending lineal kin. The handshape of spread ‘5’ fingers marks first and second ascending lineal kin of *mother*, *father*, *grandmother*, *grandfather*, and *parents*. Movement in first and second ascending lineal kin produces with two different types of movements. First ascending lineal kin (parental terms) are expressed with two short taps at either on the forehead or the chin. The term *parents* compounds both *father* and *mother* into one holistic form by a change of movement with an arc movement in between the initial location on the forehead (*father*) and the final position on the chin (*mother*).

The grandparental terms contain two lexical variants, which are identical in phonological structure except for the number of hands and movement. The first variant expresses a two-

handed form moving sagittally with one arc from the forehead.⁸⁶ Similar to the first variant, the second variant produces one-manual sign moving with two arcs. These two lexical variants may be accounted based on Frishberg's description of signs undergoing head displacement phonological processes. One criteria that defines head displacement is that two-manual signs contacting on the face would become one-manual signs; defining head-displacement (Frishberg 1975, p. 703). It would be interesting to know which grandparental lexical variant emerged prior to another variant (however it is possible that both variants simultaneously emerged); evaluating head displacement criteria as defined by Frishberg. Their overlapping phonological structures reveal two shared semantic properties indicating first and second ascending lineal kin; also semantically motivated by the location of person terms.

Exploiting location at given areas, the second kin type includes kin terms outside of immediate nuclear kin: COUSINE 'cousin-feminine', COUSIN 'cousin-masculine', NIÈCE 'niece', and NEVEU 'nephew'. These signs are expressed with initialized Quebec handshapes of N/C respectively; clearly indicating a marked category for non-nuclear kin relations.

Another category that shows a relationship between phonological structures used to mark gender in Québécois kin terms: *sister* and *brother*. These sibling terms are constructed with a lexicalized combination of two morphemes [gender + *same*]. The form for *sister* produces an 'A' handshape in the initial position, deriving from *woman*, then changes the handshape to an index

⁸⁶ This lexical variant of two-manual signs for grandparental terms used to be expressed in American Sign Language but with two arcs; reflecting a historical change of head displacement as described by Frishberg (1975).

finger while moving down to the neutral space which is also the identical handshape seen in ‘same’. In contrast, the form of *brother* realizes with the handshape of index and middle fingers spread like a ‘V’ with no internal changes in handshape. The ‘V’ handshape does not derive either from the handshapes expressed in *man* or *same*; indicating the motivation of the ‘V’ handshape is from a different domain. The location marking gender is described as a morphological preservation based on male-female distinction within a domain of signs (Frishberg 1975, p. 714).

In contrast to LSQ’s kin terms marked with gender, the first descending lineal kin, FILS ‘offspring’ do not encode gender. *Offspring* locates on the chest with a handshape of a ‘5’ moving away sagittally, which the hand will close with all fingers touching the thumb. Based on the different phonological structure seen in *offspring*, the term clearly does not derive from the same semantic domain as person terms; but maps to a different domain. The term FAMILIE ‘family’ also does not encode gender but maps to a metaphorical schema illustrating kin members enclosed in a circle with an initialized handshape of ‘F’.

Neither gender marking nor semantic derivation of person terms appears in non-nuclear kin terms of *uncle*, *aunt*, and *cousin*. These kin terms are realized in neutral space, which does not share the same semantic domain as LSQ’s person and parental terms. While these three terms overlap with an initialized LSQ handshape of O/T/C, first two terms, ONCLE ‘uncle’ and TANTE ‘aunt’ are one-manual forms, and the form of COUSIN/COUSINE ‘cousin’ expresses

with two hands. The phonological realization of neutral space and initialized handshape indicates this set of terms is a marked category.

Kinship terminology in Quebec Sign Language expresses gender marking through location where the forehead marks masculine while lower facial area marks feminine, constructing kin terms that are derived from person terms. The marked category contains non-nuclear kin terms, which they exploit initialized handshapes and a smaller set of kin terms produced in neutral space.

APPENDIX G3: DESCRIPTION OF CENTRAL AMERICAN SIGNED LANGUAGES KIN TERMS

Panamanian Sign Language

Kinship terminology in Panamanian Sign Language (Lengua de Señas Panameñas, LSP) is constructed in several different ways as illustrated by 24 identified kin terms. Location marks generational relationships to distinguish between ascending and descending generation to ego referent. Types of movement, and initialized handshapes differentiate descending, collateral, and affinal kin terms.

Ascending kin terms are located on the face. Panamanian kin terms for the ascending generations consist of *papa*, *father*, *mama*, *mother*, *aunt/uncle*, *grandparent*, and *great grandparent*. Similar to *grandparent*, the construction of *great grandparent* contains a morphological component that follows *grandparent*, indicating one generation further behind expressed with an index finger moving back over the signer's shoulder. Within the construction of *great grandparent*, the index finger may function as a numeral marking; however, more evidence is needed before this claim can be considered conclusive. Kin terms in LSP cluster in the lower facial area for the ascending kin.

The phonological structures of first ascending lineal (parental) kin terms appear to map to several different semantic domains. *Papa* depicts an iconic attribution of a mustache. Contrasting with *papa*, the phonological structure of *father* does not overlap any of the phonological features of *papa*. However, PADRE, 'father' resembles MADRE 'mother'; in that an initialized

handshape of either ‘P’ or ‘M’ maps to the semantic domain of ADULTO ‘adult’.⁸⁷ As no phonological overlap is evident in forms of *father* and *mother* and forms of *man* and *woman*, it can be concluded that parental forms are not derived from person term forms in LSP.

One set of kin terms, *stepfather* and *stepmother* overlaps with the first ascending (parental) kin terms of *papa* and *mama*. According to the phonological structure of *stepfather* and *stepmother*, it appears that both kin terms compound two morphological components of parental kin terms expressed in the initial position and the final position embedding the semantic representation for *step*. It remains unclear if the form of *step* derives from a specific conceptual domain and/or is expressed as an overt lexical unit or function as a bounded morpheme.

As for descending kin terms, they are produced in neutral space without referring to the gender of kin. The first descent lineal kin term: *offspring* does not share similar phonological structures with ascending kin terms by producing an arc movement from the signer’s chest to neutral space. The construction of *offspring* maps onto a semantic domain of ‘birth, but does not encode the gender of the child. Other two descending kin terms: *nephew/niece* and *grandchild*, are also produced in neutral space.

Not only descending kin, but also collateral and affinal kin terms are realized in gender neutral space. Collateral kin terms, *sibling* and *cousin* are realized in neutral space. Also

⁸⁷ The form of ADULTO ‘adult’ conveys a straight movement from the ipsilateral side of the cheek to the forehead overlapped with an initialized handshape of an ‘A’.

expressed in neutral space are affinal kin terms: *father-in-law/mother-in-law*, *daughter-in-law*, *son-in-law*, and *brother-in-law/sister-in-law*.

Differentiating among collateral and affinal kin terms (except for *sibling* which appears to be motivated by a different conceptual domain), four sets of kin terms overlap with initialized handshapes and cluster in similar phonological structures.

The first set consists of affinal kin terms: SUEGRO/A ‘father-in-law/mother-in-law’, NUERA ‘daughter-in-law’, YERNO ‘son-in-law’. Realized in neutral space, these kin terms combine with one-handed initialized handshape of ‘S’/‘N’/‘Y’ and a unidirectional, horizontal, arc movement. Not only an arc movement, the form of SUEGRO/A ‘father-in-law/mother-in-law’ also produces a wrist twist, suggesting two motivational possibilities. The first possibility appears to be based on phonological economy. The second possibility is that this form is more grammaticalized to denote *parents-in-law*, differentiating between in-laws of parents and children. Interestingly, the phonological form of CUÑADO/A ‘brother-in-law/sister-in-law’ does not overlap phonologically with this particular set of affinal terms, but is more similar to descending (lineal) and collateral kin terms.

The following group of kin terms contains two-handed forms for denoting descending, collateral, and affinal kinship; discriminated by form of non-dominant handshape and type of movement. The phonological structure of these kin terms illustrate how overlapping different phonological feature dimensions indicate semantic domain kin terms are typed together as shown in Appendix G3 Table G7:

Table G7:

Patterns of kin terms constructed in Panamanian Sign Language, differentiated by types of movements and handshapes

	Dominant Handshape	Dominant Movement	Non-Dominant Handshape	Location
PRIMO/A 'cousin'	Initialized-P	Unidirectional straight movement, Moving from the tip of finger to the wrist on non-dominant finger	Index finger	Neutral space
NIETO/A 'grandchild'; SOBRINO/A 'nephew/niece'	Initialized-N Initialized –S	Unidirectional arc movement, Moving from the tip of finger to the wrist on non-dominant hand	B	Neutral Space
CUÑADO/A 'brother/sister-in-law'	Initialized-C	Bi-directional arc movement, Moving between the tip of finger to the wrist on non-dominant hand	B	Neutral Space

The first and second groups of kin terms appear phonologically similar except for the handshape of the non-dominant hand, suggesting that the non-dominant handshape discriminates between collateral and descending lineal kin terms. The second and third groups of kin terms differ by the type of movement realized in the dominant handshape, differentiating descending (lineal) and affinal kin terms.

Another set of kin terms also exploit initialized handshapes to denote FAMILIA 'family' with a 'F' handshape and PARIENTE 'relatives' with a 'P' handshape. Both terms convey a

circular form, mapping to a semantic domain that kin members are enclosed into a group based on kinship relations. Initialization is robustly productive constructing kin terms in LSP.

All LSP kin terms reported in the LSP dictionary do not exploit person terms except for two kin terms. The only two kin terms reported exploit person terms with another semantic domain of *marry* are *husband* and *wife*, constructing two overt lexemes: [person term] [*marry*].

Patterns in Panamanian kinship terminology reveals no evidence showing semantic derivation of person terms to kin terms. First descending, collateral, and affinal kin terms are realized in gender neutral space, without sharing the same semantic domain as LSP's person and first and second ascending kin terms located on the face. Type of movement discriminates descending kin terms and one affinal kin term of CUÑADO/A,' brother-in-law/sister-in-law'. Non-nuclear and affinal kin all overlap with initialized handshapes of 'C', 'N', 'P', 'S', and 'Y' according to LSP's alphabet; indicating this set of terms is a marked category in Panamanian Sign Language.

APPENDIX G4: DESCRIPTION OF SOUTH AMERICAN SIGNED LANGUAGES KIN

TERMS

Argentinean Sign Language

Kinship terminology in Argentinean Sign Language (Lengua de Señas Argentina, LSA) is constructed in several different ways as described by 19 identified kin terms. Within the set of collateral terms, LSA contain numeral marking seen in terms of *cousin*, *aunt/uncle*, *nephew/niece*. The paternal term is derived from the male person term, while the female person term does not motivate the construction of the maternal term.

There are two lexical variants observed for PAPÁ ‘father’. Both lexical variants locate on the mustache area. The first variant is expressed with an index finger closing on the thumb twice, while the second variant is expressed with a handshape of ‘P’ based on LSA’s manual alphabet. Both lexical variants of *father* derive from the term of *man*, sharing a similar phonological structure except for movement (and the difference in handshape observed in the second lexical variant). The construction of *stepfather* sequentially produces with two lexical units: the first variant of *father* and *second*. Interestingly, there used to be a third variant denoting *father* with two wrist flicks of a handshape of ‘P’ situated in the neutral space. However, this particular form has lost the semantic property to refer to a paternal form, but has lexicalized to denote *parents* (Druetta, personal communication).

Unlike the paternal term of two lexical variants, there is only one lexical variant denoting *mother*. The phonological structure of *mother* reveals an iconic motivation of female breasts with

one bent hand moving from the contralateral to the ipsilateral breasts. Based on the description of the maternal term, it does not derive from two lexical variants of the person term of *woman*. The first variant of *woman* expresses with extended index and middle fingers ('V' handshape), sliding with the back of the palm twice on the chin area. Similar to the first variant, the second variant of *woman* constructs with an index finger wrapped over the thumb. The motivation of the second variant appears to be rooted to the behavior of women putting lipstick on their lips. However, the second variant is used more among elder Argentines, while younger Argentines predominantly express the first variant of a 'V' handshape (Druetta, personal communication). The construction of *stepmother* realizes two lexical units sequentially: *mother* and *second*. Parental forms are the only terms that encode gender in LSA kin terms.

The differentiation of gender is not obligatory in remaining Argentinean kin terms. However, depending on the discourse context, Argentines may choose to express gender with either initialized handshapes of 'A' or 'O' according to written Spanish orthography to denote feminine or masculine referents (Druetta, personal communication). Within the set, two subsets are divided according to where kin terms are located on the body or in neutral space. The first subset contains kin terms realized on the face, and these terms are *offspring*, *grandparent*, and *grandchild*. The form, *offspring*, produces with a flick of bent index and middle fingers under the chin, then moves away while extending index and middle fingers in neutral space. Interestingly, this form of *offspring* maps on to a metaphorical domain of the birth of a child, representing the legs of a child coming out of the mouth cavity (Druetta, personal communication).

The forms of *grandparent* and *grandchild* are phonologically similar with a spread hand crawling up on the ipsilateral side of the face. The form represents the degree of deep creased wrinkles and maps on a metaphorical domain of UP IS MORE (Druetta, personal communication). The term of *grandparent*, the hand crawls up to the ipsilateral side of the forehead, while the hand in *grandchild* reaches up to the cheekbone area. As the hand goes higher to the ipsilateral side of the forehead, it indicates the increased degree of wrinkles, reflecting elder age. The form of *grandchild* may optionally express another lexical unit of *child*.⁸⁸ While these kin terms do not differentiate by gender, they may optionally indicate which gender is encoded. An optional strategy to discriminate gender is sequentially realizing an initialized handshape of ‘O’ or ‘A’ following the kin term. Patterns show that the first and second ascending and first and second descending kin terms contact on the face; however the paternal terms are the only kin terms that discriminate based on gender.

The remaining set of Argentinean kin terms is situated in neutral space, which does not mark gender. Among kin terms, they are *father-in-law/mother-in-law* and *sibling*. The form of *Sibling* shares a similar phonological structure to *twins*, differentiating in handshape of an index finger for *sibling* and a full hand (‘B’) for *twins*. Both terms map on the semantic domain of *same*, sharing similar phonological structures except for movement.⁸⁹ The form for *same* shows

⁸⁸ The form of NIÑO/NIÑA ‘child’ denotes the short height of a child.

⁸⁹ According to the LSA dictionary, there are three lexical entries for IGUAL ‘same’, which may construe different semantic-pragmatic uses in LSA discourse.

one movement and other two terms expressing two movements. All these kin terms are realized in gender neutral space.

Spouse has two lexical variants. One variant derives from the lexical unit of *marry* with two-handed sign of an index and pinky finger moving in an arc movement from ipsilateral to center neutral space. The first lexical variant realizes with both pinky fingers hooked together in a stative form. The second lexical variant resembles to the first lexical variant, but instead is produced with two index fingers. The form of *marry* motivates the construction of the spousal term, indicating that lexicalization occurred by a change of movement.

Within a small set of four kin terms, their phonological structures suggest a shared semantic domain seen in *aunt/uncle*, *cousin*, *niece/nephew*, and *brother-in-law/sister-in-law*. The domain these kin terms seem to share is numeral marking. The handshape of selected fingers appears to reflect the degree of separation with respect to ego referent in Appendix G4 Table G8:

Table G8

Argentinean kin terms

Count of fingers	Spanish Translation	English Translation
1	TÍO/A	<i>uncle/aunt</i>
1 in between 2	PRIMO/A	<i>cousin</i>
2	CUÑADO/A	<i>brother-in-law/sister-in-law</i>
2	SOBRINO/A; SOBRINOS/AS	<i>nephew/niece</i>

Observing the similarity in these kin terms, the pattern suggests that these kin terms are motivated based on a similar semantic domain, reinforcing the same observation made by

Massone and Johnson (1991). One possibility is the handshape functions as numeral marking, representing the degree of separation in collateral relations. The first ascending lineal kin term, TÍO/A ‘uncle/aunt’, is expressed with both index fingers tapping each other, encoding a number of one degree of separation. The first descending lineal kin term constructs with both index and middle fingers tapping each other, depicting a number of two to refer to *niece/nephew*. The construction of *cousin* contains a dominant handshape of an index finger (‘1’) tapping in between the non-dominant spread index and middle fingers (‘2’). The constructions of Argentinean collateral terms clearly demonstrate a pattern possibly tied to numeral marking or other motivations.

Argentinean kinship terminology reveals that the paternal term is motivated by the male person term while based on dissimilarity in phonological structure, the maternal term does not overlap the domain of the female term. Patterns illustrate first and second ascending and first descending kin terms contact on the body, while the remaining set of kin terms situates in neutral space. No initialized handshape are realized in most Argentinean kin terms except when the signer chooses to qualify the gender of kin referent by expressing initialized handshapes of ‘O’ or ‘A’ in the final position following the signed kin term.⁹⁰

⁹⁰ Two lexical entries illustrate that ABUELO/A ‘grandfather/grandmother’ may produce either ‘O’ or ‘A’ in the final position of the sign production, and one lexical variant of PAPÀ ‘father’ contains the handshape of ‘P’, indicating initialized handshapes do behave as a marked category.

Brazilian Sign Language

Most of the 23 kin terms in Brazilian Sign Language (Língua Brasileira de Sinais, LIBRAS) incorporate initialized handshapes except for person, grandparental, sibling, and offspring terms. An initialized handshape map to the initial letter of the orthographic form in Portuguese; observing 16 kin terms are expressed holistically composed with other conceptual domains in some kin terms. Brazilian kin terms do not differentiate in gender except for terms of *father*, *mother*, *daughter-in-law*, and *son-in-law*.

The form of *man* iconically depicts a man's beard. The form of *woman* conveys with an extended thumb brushing on the ipsilateral jaw.⁹¹ Patterns show that person terms do not motivate constructions of Brazilian kin terms except for *boy* and *girl*. There are two lexical variants reported for *boy* and *girl* that are semantically derived from *man* and *woman*. The first variant of *boy* exploits the form of *man* except for a change of handshape. The handshape realized in *man* is a full spread hand ('5') while *boy* expresses with an index finger and the thumb; suggesting a possible diminutive property, as there is fewer fingers selected in the handshape of the form *boy* compared to *man*.

The person term of *woman* also extends to the first variant of *girl* as they share an identical form. The forms of *man* and *woman* semantically extend to include *boy* and *girl*, illustrating that LIBRAS do not differentiate age in person terms. However, the second variant of

⁹¹ The form of MULHER 'woman' resembles similar to the form of *woman* and/or *girl* in other signed languages (E.g. American and Quebec: *girl*).

boy and *girl* convey a qualifier description of *child* following person term; constructing as [person term] [*person-whose-height-is-short: child*]. The construction of the second variant of *boy* and *girl* suggests these forms are marked due to larger construction units expressed with two overt lexemes which the form *child* specifies the semantic property of age, specifying *boy* and *girl*.

Person terms motivate one set of lexical variants of parental terms while another lexical variant does not construct with person term. The form *mother* may realize either as the first variant: [*woman*] [*parent*] or the second variant minus person term: [*parent*]. As there are two lexical variants of *father*, one variant derives from the form of *man* constructed with another lexical unit, illustrating as [*man*] [*parent*]. Another variant is a combination of a signed form as a metonymically depiction of a man's mustache and a fingerspelled construction expressed as P-A-I. The combination of the mustache form and fingerspelled construction of PAI-2 'father' is more common used than the signed form PAI-1 'father' ([*man*] [*parent*]) is less common used in LIBRAS discourse (Leland McCleary, personal communication).

The term VÓVO 'grandparent' expresses in two lexical variants. One variant is realized by fingerspelling of V-O-V-O. Another variant of VÓVO 'grandparent' overlaps in phonological structure with the term BISAVÓ 'great-grandparent' - except for handshape. Comparing forms of *grandparent* 'grandfather/grandmother' and BISAVÓ 'great-grandfather/great-grandmother'

indicate that the conceptual domain of *old* motivates both forms.⁹² BISAVÓ ‘great-grandparent’ forms with two compositional units: [*two* + *old*]; demonstrating numeral incorporation realized by handshake. The numeral incorporation of *two* appears to be motivated by the Portuguese form *bis* ‘second’ which would be translated as *second grandparent*; reinforcing that constructions of Brazilian kin terms are sensitive to orthographic forms in Portuguese.

Similar to grandparental terms, the term for *grandchild* locates under the chin; suggesting shared conceptual mapping with terms of *grandparent* and *great grandparent*. In contrast, NETO/A ‘grandchild’ realizes with an initialized handshape of ‘N’ with a stative movement; indicating *grandchild* is possibly a marked term compared to grandparental terms. In contrast, the first descending kin term for *offspring* is motivated by a different conceptual domain; realizing with a open hand (‘5’) on the chest moving away to neutral space with a closed flat hand. Comparing *grandchild* with the first descending and grandparental kin terms, the form NETO/A clearly is marked. With respect to ascending and descending lineal terms except for *mother* and *mother*, gender is not discriminated but instead is differentiated by generation.

Kin terms that do not overlap with initialized handshape or are realized through fingerspelling, appeared to map to other conceptual domains. For instance, the collateral term SOBRINHO/A ‘nephew/niece’ expresses with a flat closed handshape sweeping up on the forehead. The location of the forehead also construct the form of TIO/A ‘uncle/aunt’;

⁹² The forms of VÓVO and BISAVÓ taps upward on the chin while handshape differs; VOVO with a closed fist and BISAVÓ with spread index and middle fingers (‘V’).

differentiating in handshape and movement with the form of SOBRINHO/A ‘nephew/niece’. The handshape of TIO/A ‘uncle/aunt’ forms with a curved hand of a ‘C’ statically located on the forehead; indicating there is no overlap by Portuguese forms of *tio* and *tia* (‘uncle’ and ‘aunt’)—as the handshape does not overlap with the manual representation of a ‘T’ but with a ‘C’. In contrast, the term PRIMO/A ‘cousin’ situates two-manual handshapes of ‘P’ in neutral space, alternating in sagittal, straight movements. The exploitation of location and movement seen in the form of PRIMO/A ‘cousin’ may be motivated by a particular conceptual domain; however, it remains unclear what is the motivation except for the initialized handshape of ‘P’. Interestingly, the phonological structure of PRIMO/A ‘cousin’ resembles to the form of *sibling*.⁹³ The differentiation in both forms rests on the proximity of the index fingers. The index fingers rub each other in the form of *sibling*, but in the form of PRIMO/A ‘cousin’, index fingers of ‘P’ do not contact each other. Comparing these three collateral kin terms of *cousin*, *niece/nephew*, and *aunt/uncle*, the phonological structure of PRIMO/A appears to be more marked due to the presence of an initialized handshape in the signed form.

Out of 22 kin terms, eight kin terms overlap with initialized handshapes. The form of FAMÍLIA ‘family’ maps to a metaphorical schema of a circle with two-manual ‘F’ initialized handshapes. The term SOGRO/A ‘father-in-law/mother-in-law’ trills in neutral space with an

⁹³ Two forms of IRMAO/IRMÃ ‘brother/sister’ situates in neutral space. The first variant realizes with one-handed form of index and middle finger moving in an alternating, trilled movement; denoting same. The second form expresses by a two-handed form of index fingers rubbing each other by alternating straight, sagittal movement.

initialized handshape of ‘S’. The expression of NORA ‘daughter-in-law’ and GENRO ‘son-in-law’ situates on the contralateral clavicle; differentiating by initialized handshapes of ‘N’ and ‘G’. These terms are the only forms that discriminate by gender of kin referents except for parental terms. The function of initialized handshapes is not to discriminate between specific kin terms of similar phonological structure seen in some kin sets in other signed languages, but an influence of orthographic forms in Portuguese.

Four other Brazilian kin terms sequentially construct with two overt lexemes: one of two lexical variants of PAI ‘father’, PADRASTO ‘stepfather’, MADRASTA ‘stepmother’, and IRMÃO/A DE CRIAÇÃO ‘half-brother/half-sister’. The terms of MADRASTA ‘stepmother’ and PADRASTO ‘stepfather’ convey two signs in sequence: [*parental term*] [*second*]. The form of IRMÃO/A DE CRIAÇÃO ‘half-brother/half-sister’ forms by two lexemes: [*half*] [*sibling*]; noting the order of lexical units is reversed compared to the Portuguese term. Except for one lexical variation of PAI ‘father’, these kin terms are marked by larger constructions of two lexemes as compared to other holistic forms in Brazilian Sign Language.

Patterns reveal that the first orthographic letter of Portuguese kin terms motivates some Brazilian kin terms. The function of initialized handshapes does not differentiate gender in kin terms but instead specify kin relations by written Brazilian forms. The only kin terms that do not convey initialized handshapes are mapped to different conceptual domains (as discussed about *grandparent* mapped to the semantic domain of *old*), but also appears to be sensitive to semantic properties denoted and constructions in Portuguese (E.g. realizing the Portuguese morpheme of

bis through numeral incorporation in the form BISAVÓ ‘great-grandparent’). No evidence could be found illustrating that person terms motivate kin terms in Brazilian Sign Language.

APPENDIX G5: DESCRIPTION OF CENTRAL ASIA SIGNED LANGUAGES KIN TERMS

Afghan Sign Language

Kinship terminology in Afghan Sign Language (AFSL) is constructed primarily by person and parental terms as described by 25 reported kin terms. The female person term motivates the form of *mother*, but the form of paternal term is not derived from the male person term. There are few kin terms that do not contain signs of *man* or *woman*, but instead denote either paternal or maternal kin relations. Gender is marked by the location of the signs; differentiating paternal relations on the ipsilateral side of the jaw while the ipsilateral of the forehead marks maternal relations.

The form of *man* depicts an iconic attribution of a mustache; producing with an extended index finger and thumb from a closed fist situated on the mustache area. As for the term *father*, the form realizes with a spread hand ('5' handshape) with the thumb contacting on the chin. The phonological structure of *father* shows that it does not semantically derive from the form of '*man*'. On other hand, the form of *mother* derives from the term of *woman* due to similar phonological structures. The sign for *woman* depicts an iconic description of the hair length of an Afghan woman, conveying a full handshape moving down from the ipsilateral side of the forehead to the ipsilateral shoulder. Comparing the form of *woman* to the form of *mother* illustrates a phonological reduction in the length of movement, which also denotes a change in location from the ipsilateral shoulder (*woman*) to the ipsilateral cheek (*mother*). The change in

the phonological structure indicates that *mother* experiences lexicalization from the form of *woman*; illustrating the person term *woman* motivates the form of *mother*.

There are two sets of Afghan kin terms that construct based on either person or parental terms. Both person and parental terms are realized in the initial position in most constructions of two or three lexical units. A paradigm of kin terms constructed with person or parental terms is described below in Appendix G5 Table G9:

Table G9

Afghan kinship terminology

	<i>person- whose-height- is-short</i>	<i>possessive- pronoun</i>	<i>same</i>	<i>marry</i>	<i>hand-holding- a-stick (old)</i>	<i>in-law</i>
<i>man</i>	<i>boy</i>	<i>son</i>	<i>brother</i>	<i>husband</i>		<i>brother-in-law*</i>
<i>woman</i>	<i>girl</i>	<i>daughter</i>	<i>sister</i>	<i>wife</i>		<i>sister-in-law*</i>
<i>father</i>			<i>paternal uncle</i>		<i>grandfather</i>	<i>father-in-law</i>
<i>mother</i>			<i>maternal aunt</i>		<i>grandmother</i>	<i>mother-in-law</i>
<i>second</i>				<i>co-wife</i>		

**brother-in-law* and *sister-in-law* are formed by three lexical units.

Person terms construct the domain of first descending kin, sibling (co-lineal) kin, affinal kin, and spousal kin. Five out of eight male kin contain the term of *man* positioned first within the construction, while three male kin express with the term *father*. Four out of seven female kin produces with the form, *woman*, and the other three female kin exploit the form of *mother*. Except for *brother-in-law* and *sister-in-law*, all of these kin terms produce constructions of two lexical units, positioning either person or parental terms preceding another lexical unit. The first

descending kin terms of *son* and *daughter* realizes with a grammatical sign of a first-person singular possessive pronoun; constructing *son*: [*man*] [*1.p-poss-pronoun*]; *daughter*: [*woman*] [*1.p-poss-pronoun*]. The construction of affinal kin terms, *brother-in-law* and *sister-in-law*, are realized with three lexical units: [person term] [*in-law*] [*same*]*. Person terms productively motivate constructions of Afghan kin terms.

The domain of first and second ascending lineal kin terms is produced with parental terms. Along with ascending lineal kin terms of *grandfather*, *grandmother*, *paternal uncle-1*, and *maternal aunt*, affinal terms, *father-in-law* and *mother-in-law*, realize with either *father* or *mother* proceeding to another lexical unit. Constructing kin terms with parental terms robustly produces this specific domain of Afghan kinship terminology.

As for other three male kin terms, they are expressed in a singular holistic form. These terms are *father*, *paternal uncle-2*, and *maternal uncle*.⁹⁴ The latter two terms: *paternal uncle* and *maternal uncle*, differ by having no phonological overlap with person term of *man*. Discriminating between maternal and paternal uncles, these terms are identical in the phonological structure except for location. As for *maternal uncle*, the sign moves from the ipsilateral forehead to the jaw with a closed fist with an extended thumb ('A' handshape); overlapping location of the parental term of *mother*. The form of *paternal uncle* produces on the

⁹⁴ There are two lexical variants of *paternal uncle*. One variant constructs with two signs: [*father*] [*same*], while another variant is a holistic form marked by paternal lineage [*paternal-uncle*]. In contrast, only one kin term is reported for *maternal aunt*, but no term for *paternal aunt*.

chin, moving from the ipsilateral to the contralateral side on the chin; marking paternal relation by the location overlap of *father*. This is also observed in two other kin terms describing the relationship of *brother's offspring* and *sister's offspring*. To denote the kin relation of *brother's offspring*, the sign is realized on the jaw, while the term, *sister's offspring*, locates on the ipsilateral side of the forehead. These kin terms are based on the relationship between the ego referent and sibling kin, not gender of the offspring.

The pattern reveals that location is semantically derived from the terms of *man* and *woman*; illustrating location is exploited to mark gender in Afghan kinship terminology. Kin terms realized on the ipsilateral side of the head mark feminine, while the lower facial area (chin or jaw) marks masculine.

Three kin terms are constructed with the sign *marry*; producing *husband*, *wife*, and *co-wife* with signs *man*, *woman*, and *second* prior to *marry*. Comparing the free-standing verbal form of *marry*, the form of *marry* constructed in these spousal terms, *marry* illustrates a phonological reduction by only expressing the final position of the sign; depicting only the grasping of hands. The verbal form realizes with the dominant bent 'B' handshape on the back of the non-dominant bent 'B' handshape, then moves the dominant hand to grasp the non-dominant with a change of palm orientation. Within the set of these spousal terms, the form of *marry* is phonologically reduced first before the first lexical unit of a full preserved form; indicating an interesting linguistic behavior of lexicalization in Afghan Sign Language.

Patterns illustrate that most Afghan kin terms productively construct either using person or parental terms. Without constructing either person or parental terms in kin constructions, kin terms like *paternal uncle*, *maternal uncle*, *brother's offspring*, *sister's offspring*, are motivated by exploiting the location of parental terms; suggesting a gradual emergent grammaticalization of gender marking.

Indo-Pakistani Sign Language

The signed language in India and Pakistan was traditionally assumed to be two distinct languages until Zeshan (2000) concluded these distinctions are more of varieties of one signed language. Zeshan found that signed varieties in India and Pakistan are similar, defined by labeling it as Indo-Pakistani Sign Language (IPSL). However, older documents such as dictionaries identify either as Indian Sign Language or Pakistani Sign Language.⁹⁵

Within the set of kinship terms in IPSL, Zeshan observed lexical variations associated to regions (2000, p. 33). Her analysis (2000) did not discuss the range of lexical variation in IPSL kinship terminology and which lexical forms are more standardized as opposed to other forms that are more lexically varied.⁹⁶ Identifying ISPL kinship terms as componential signs, Zeshan described most kin terms as a construction of two parts in all regional varieties studied.⁹⁷

⁹⁵ Pakistani Sign Language: ABSA Research Group. (1989). *Relationships in sign language*. Karachi, Pakistan: Anjuman Behbood-e-Samat-e-Atfal, (ABSA School for the Deaf).

Indian Sign Language: Vasishta, M., DeSantis, S., & Woodward, J. (1985). *An introduction to the Bangalore variety of Indian Sign Language*. GRI Monograph Series, 4. Washington, DC: Gallaudet Univ.

⁹⁶ Zeshan collected data from Karachi and Islamabad (Pakistan) and New Dehli (India) during 1994-1998.

⁹⁷ Zeshan discriminated between componential signs and compounds. She defined a componential sign as a form expressing two parts where one part may be identically realized within a set of two part lexicon. As for compounds, they emerge into new forms, coined from two independent, free-standing lexical forms. Two independent forms undergo phonological reduction and assimilation of movement, location, and handshape, and also lose stress in the first sign. Extensive changes in phonological structures of two lexical independent forms lead to a

Expressing either a person term of *man* or *woman* in the initial position of the construction, the second position specified a kin relation with no reference to gender (2000, p. 33). With respect to the parental terms of *father* and *mother*, *father* expressed in a single morphemic unit, while *mother* was conveyed by two parts of the sign. As the first componential unit conveys *female*, the second part of the form *mother* carried no distinct semantic independence departing from the IPSL pattern of kinship construction. Furthermore, IPSL contained no independent form for *parents*, but instead combined both parental terms: *father* and *mother* to denote *parents* in a compounded form (2000, p. 33, p. 82).

Zeshan argues that IPSL kinship terms are compositional not compounded, because these terms do not demonstrate any assimilation processes or formational changes in the two signs involved (2000, p. 85). These signs are semantically similar to the compounds in that meaning is not totally predictable on the basis of individual signs. This raises an interesting question involving signers' awareness of sign construction either as a composition of two signs or as a composition that has become opaque. For instance, if the construction conveys two lexemes of [*man*] [*marry*], how do signers discriminate between *husband* and the event of a man who gets married? This particular issue challenges linguists to continue with more in-depth discussion regarding how to conduct lexical analysis by examining patterns within the signed lexicon to determine whether morphological structure is compositional, compound, or holistic.

change in semantics which is distinct from the semantics of two independent lexical forms, which merits a closer look on the functions of these constructions.

Zeshan's analysis defines Indian and Pakistani varieties as Indo-Pakistani Sign Language, which will be discussed in the following section. Two varieties of IPSL will be examined, Bangalore and Karachi, based on dictionaries of Vashita *et al.* (1985) and ABSA Research Group (1998).

Indo-Pakistani Sign Language: Bangalore

Most of the 13 kin terms in the Bangalore variety of Indo-Pakistani Sign Language (IPSL: Bangalore) constructs kin terms based on gender marking. The Bangalore variety realizes kin terms of *woman* and *man* sequentially in constructions of two lexical units; constructing person terms in the initial position. Out of 13 kin terms, 10 kin terms are constructed with two lexical units while 3 kin terms express in a holistic form (one lexical unit).

Identical in phonological structure, *mother* contains no movement (stative) while *woman* moves in a circle with an ‘A’ handshape (closed “flat” fist with an extended thumb) on the ipsilateral cheek. The similarity in the phonological structure indicates that the form of *mother* is derived from the person term of *woman*. Furthermore, the form *girl* also expresses a slightly similar handshape of a bent hand, moving the back of the fingers down on the cheek⁹⁸. Based on the phonological structure of these three terms, they share the same semantic domain of femaleness; differentiating by types of movement or a slight change in handshape.

The form of *man* is realized with a change in handshape from the initial formation to final formation. The initial formation consists of an index finger situated on the upper lips, depicting an iconic form of a mustache. The final formation produces an index finger crooked onto the thumb, contacting on the ipsilateral cheek. Identical to the final formation seen in the form of

⁹⁸ The difference between an ‘A’ handshape (closed hand with an extended thumb) and a bent hand is the contact between inside of fingers on the palm. While an ‘A’ handshape ensures inside of fingers contact the palm, the bent hand does not.

man, the form of *boy* produces with a crooked index finger moving in an arc on the ipsilateral cheek. Although there is no lexical entry of *father* in the IPSL-Bangalore dictionary, it is predicted that *father* could be derived from the form of *man* based on the analogy of *woman* and *mother*. Patterns show that both genders situate on the lower facial area, motivating a semantic domain to express person terms and parental terms.

The second ascending lineal forms share similar constructions; mapping on the domain of *hand-holding-on-a-stick* where the closed fist locates in the neutral space. The form of *grandmother* constructs with two morphemes: [*mother*] [*hand-holding-on-a-stick*], realizes the form of *mother*. While *grandfather* expresses the lexeme of *hand-holding-on-a-stick*, the form does not map on the paternal form but instead construct with the sign *old*: [*old*] [*hand-holding-on-a-stick*]. Although grandparental terms share the same domain expressing *hand-holding-on-a-stick*, between these two terms shows an asymmetry in second ascending lineal terms with respect to the mapping of parental terms.

The remaining set of kin terms reveal a pattern constructed of two lexical units, by marking gender in the initial position while other lexical units follow. The feminine marking is produced with an index finger contacting the ipsilateral side of the nose.⁹⁹ To mark masculine, male kin terms convey an index finger located on the mustache area, similar to the first

⁹⁹ The phonological structure of the feminine marking is also observed in the construction of QUEEN; suggesting that feminine marking may be more pervasive in other semantic domains outside of kinship terminology. Interestingly, the form of TUESDAY is identical to the form of feminine marking.

component expressed in the form of *man*. Both markings map on cultural-dependent frameworks attributed to females with a nose piercing and males with mustaches. Eight kin terms are described in the table as followed in Appendix G5 Table G10:

Table G10

Indo-Pakistani-Bangalore kin term constructions

	Masculine marking	Feminine marking
<i>baby</i>	<i>son</i>	<i>daughter</i>
<i>elder</i>	<i>elder brother</i>	<i>elder sister</i>
<i>younger</i>	<i>younger brother</i>	<i>younger sister</i>
<i>marry</i> ¹⁰⁰	<i>husband</i>	<i>wife</i>

Based on this paradigm, gender marking is prevalent in nuclear kin and spousal terms. Since the form of feminine marking does not derive from the female person term where pointing on the ipsilateral side of the nose conveys feminine marking, denoting the function of feminine marking as there is no overlap with person term of *woman*. Masculine marking overlaps with the form of male person term; expressed by an extended index finger on the ipsilateral side of the upper lip. Although the form of masculine marking derives from the male person term (the first component of the male person), the behavior of the form indicates it has grammaticalized to function as a masculine marking.

There is one lexical entry for *uncle* that does not exploit gender marking, but instead constructs a different phonological structure from the stative form of a curved index finger and thumb realized in neutral space. There is no phonological overlap seen in *uncle* with other male

¹⁰⁰ There is no lexical entry for *marry*; however, based on the form observed in *husband* and *wife*, it appears to denote *marry* as the form conveys both hands clasp together representing a joint state between *husband* and *wife*.

kin; indicating its construction depends on another domain than that observed in IPSL-Bangalore kin terms. The pattern, however, demonstrates that gender marking productively constructs most of IPSL-Bangalore kinship terminology.

Gender marking motivates most constructions of IPSL-Bangalore kin terms. Within the set of nuclear kin terms, most terms mark gender except for ascending lineal kin terms that constructs with a person term other than *grandfather*. There appears to be an asymmetry in the paradigm of constructing male kin terms. Other than male nuclear kin terms, the forms of *uncle* and *grandfather* do not share the phonological structure seen in IPSL-Bangalore male and female kin terms, suggesting other conceptual domains frame the motivation for constructing these kin terms.

Indo-Pakistani Sign Language: Karachi

According to the 43 kin terms identified in the Karachi variety of Indo-Pakistani Sign Language (IPSL-Karachi), kin terms productively construct on person terms. Person terms are realized in the initial position in all constructions ranging from two to four lexical units. The only two kin terms that are realized as one lexical unit are *father* and *mother*.

Gender marking is semantically mapped onto IPSL-Karachi signs for *woman*, by locating on the ipsilateral nose. The form of *woman* expresses with an index finger contacting the ipsilateral side of the nose; depicting the cultural framework associated to Pakistani women. While the maternal term derives from female person term, the phonological structure of *mother* conveys two components of one lexical unit. The two components consist of: an index finger contacting the ipsilateral nose, then moving up to the ipsilateral forehead with a contact of the fingertips of a full hand. Although the term of *mother* exploits the form of *woman*, based on an overall review of the lexical entries in the dictionary, this form appears to be lexicalized. The form *mother* productively constructs kin terms of *cousin*; *granddaughter* (*daughter's daughter*); *grandson* (*daughter's son*); *mother-in-law*; *parents*; *stepmother*.¹⁰¹ Pointing an index finger at the ipsilateral nose functions as feminine marking in Karachi female terms.

Masculine marking derives from the form *man*; located on the upper lips. The form *man* is produced by a fist with an index finger contacted on the thumb, locating on the ipsilateral, upper lip with no movement. This form *man* is mapped onto the framework of male's physique,

¹⁰¹ The form *cousin* constructs as follows: [*father*] [*mother*] [*two-hands-moving-sagittal-in-neutral-space*].

referring to the iconic depiction of a mustache. On the other hand, the form of *father* does not show any phonological overlap with the term *man*. The form *father* productively constructs kin terms of *cousin*; *father-in-law*; *granddaughter* (*son's daughter*); *grandson* (*son's son*); *grandfather*; *parents*; *stepfather*.

According to the IPSL-Karachi dictionary, kin terms contain person terms, realizing person terms positioned first within the construction. Except for first ascending lineal (parental) kin terms, the remaining kin term construction includes two or more lexical units in a sequence. Derived from person terms, kin terms clearly state type of kin relation by explicit description. For instance, the form *nephew* (*brother's son*) constructs using four lexical units: [*man*] [*sibling*] [*man*] [*person-whose-height-is-short: child*]. The examination of Karachi kin terms shows a robust pattern of kin terms explicitly described with overt lexemes.

Based on whether the IPSL-Karachi dictionary depicts the sign as holistic compared to a sequence of two or more units, the challenge is in the determination of the count of lexical units. For instance, lexical entries of offspring, sibling, spousal, and grandparental terms are expressed in an illustration of two distinct forms expressed in a sequence shown in Appendix G5 Table G11:

Table G11

Constructions of lineal and spousal kin terms in IPSL-Karachi

Constructions of Female Referents	Female Term	Lexical Unit	Constructions of Male Referents	Male Term	Lexical Unit
<i>girl</i>	<i>woman</i>	<i>child</i>	<i>boy</i>	<i>man</i>	<i>child</i>
<i>daughter</i>	<i>woman</i>	<i>baby</i>	<i>son</i>	<i>man</i>	<i>baby</i>
<i>sister</i>	<i>woman</i>	<i>sibling*</i>	<i>brother</i>	<i>man</i>	<i>sibling*</i>
<i>wife</i>	<i>woman</i>	<i>marry</i>	<i>husband</i>	<i>man</i>	<i>marry</i>
<i>grandmother</i>	<i>woman</i>	<i>hand-holding-a-stick</i>	<i>grandfather</i>	<i>father*</i>	<i>hand-holding-a-stick</i>

Based on pattern, person terms productively construct first descending lineal, sibling (co-lineal), and spousal terms along with person terms of *girl* and *boy*; denoting gender of the kin referent. These kin terms appear to be lexicalized constructions of two overt lexemes, as these terms construct other kin terms. A note about the term *sibling*, there is no lexical entry of *sibling* in the Karachi dictionary. However, by deduction observing other kin terms in the paradigm, the second lexeme functions as *sibling*.

As for grandparental terms, the paradigm illustrates asymmetry in constructing *grandfather* compared to *grandmother*. The form *grandmother* follows a similar pattern by expressing: [*woman*] [*hand-holding-a-stick*], but the form *grandfather* constructs with a paternal term: [*father*] [*hand-holding-a-stick*]. IPSL-Karachi does not discriminate between maternal and paternal grandparents.

The paradigm of non-nuclear kin terms reveals explicit description of kin relations through constructions of overt lexical units. The constructions describe kin terms of second descending lineal kin (grandson and granddaughter) and descending collateral kin (nephew and niece) as illustrated in Appendix G5 Table G12:

Table G12

Constructions of kin terms of grandson, granddaughter, nephew, and niece in IPSL-Karachi

Kin Term	boy: [man] [child]	girl: [woman] [child]
<i>mother</i>	<i>grandson</i>	<i>granddaughter</i>
<i>father</i>	<i>grandson</i>	<i>granddaughter</i>
<i>sister</i> [woman] [sibling]	<i>nephew</i>	<i>niece</i>
<i>brother</i> [man] [sibling]	<i>nephew</i>	<i>niece</i>

The paradigm reveals a pattern in constructing second descending kin terms. To construct a kin term, the first column of parental and sibling terms are positioned first, while the first row refers to the second lexical unit. For instance, the term *grandson* constructs from three lexical units, shown as: [father] [man] [child]. The construction literally translates as *father's boy* according to the Karachi dictionary; however, the term *father's boy* refers to *son's son* on the basis of the paradigm compared with other second descending lineal kin terms. In contrast, the term *granddaughter*: [father] [woman] [child] refers to *son's daughter*. This type of construction also applies to *daughter's daughter* and *daughter's son* where *mother* is realized in the initial lexical unit of the construction; specifying the Ego's relation to the grandchild. Terms denoting

grandchildren specify gender of the child and kin relations based on either maternal or paternal lineage.

Similar to kin terms of grandchildren, the forms of *nephew* and *niece* also indicate relationship based on the child of the sibling. These terms construct with two lexical units with respect to ego referent produced with two lexical units totaling to a construction of four lexical units. For instance, the term *niece*: [woman] [sibling] [woman] [child] transliterates as *sister's daughter*. In contrast, the term *niece (brother's daughter)* produces [man] [sibling] [woman] [child]. Terms of *nephew (brother's son)* and *nephew (sister's son)* construct from [man] [sibling] [man] [child] and [woman] [sibling] [man] [child] respectively. Gender is expressed in both sibling and child terms. This behavior suggests that IPSL-Karachi does draw distinction among descending lineal and collateral kin based on gender and kin relation.

To define ascending collateral and affinal relations, IPSL-Karachi produces five different forms that refer to specific relations by differentiating between paternal and maternal lineage. Four forms denoting ascending collateral and affinal relations share some similarities in their phonological structure, except for the fifth form that differs in handshape. The first four forms move in an arc from the ipsilateral side of the face to the center neutral space. These four forms are produced with an index finger, while the exceptional form exploits handshape similar to the paternal form: a fist with an extended thumb. All forms ends in the final position in the same location: the center of neutral space; however, the initial location differs in these four forms. A paradigm illustrates how two lexical units construct a kin term. The first column refers to the

lexical unit (E.g. *woman*; *man*; *mother*; *father*) preceding to the first row, describing the phonological structure of the second lexical unit as follows in Appendix G5 Table G13.

Table G13

IPSL Karachi phonological structure, differentiating among ascending collateral and affinal terms

Location:	under the chin	on the cheek	on the chin, under the bottom lip	on the jaw	near chin but no contact on the face	neutral space
Handshape:	a fist with extended thumb	index finger	index finger	index finger	index finger	one hand grasp
<i>woman</i>	<i>wife of father's younger brother (paternal aunt)</i>	<i>father's sister (paternal aunt)</i>	<i>wife of mother's brother (maternal aunt)</i>	<i>mother's sister (maternal aunt)</i>		<i>brother's wife (sister-in-law)</i>
<i>man</i>	<i>husband of father's younger sister (paternal uncle)</i>	<i>father's brother (paternal uncle)</i>	<i>husband of mother's sister (maternal uncle)</i>	<i>mother's brother (maternal uncle)</i>		
<i>mother</i>					<i>mother-in-law</i>	
<i>father</i>					<i>father-in-law</i>	
<i>daughter [woman] [baby]</i>					<i>daughter-in-law</i>	
<i>son [man] [baby]</i>					<i>son-in-law</i>	
<i>sister [woman] [sibling]</i>					<i>husband's sister (sister-in-law)</i>	
<i>brother [man] [sibling]</i>					<i>husband's brother (brother-in-law)</i>	
<i>wife [woman] [marry]</i>					<i>wife's sister (sister-in-law)</i>	
<i>husband [man] [marry]</i>					<i>wife's brother (brother-in-law)</i>	

Constructions of first ascending collateral kin terms base on person term and second lexical unit specifying kin relation to the Ego. Similar to collateral terms, affinal terms produce using two or three lexical units. However, the first lexical unit bases construction of paternal on one lexical unit, while offspring, sibling, and spousal terms construct using two lexical units.

Patterns reveal location of the initial position explicitly defines relation with respect to the Ego referent. The initial position locating on the cheek marks consanguineal paternal relation, while the location on the jaw marks consanguineal maternal relation. As for maternal non-consanguineal collateral terms of *wife of mother's brother* and *husband of mother's sister*, the index finger situates on the chin under the bottom of the lips. In contrast, paternal non-consanguineal collateral terms of *wife of father's younger brother* and *husband of father's younger sister* locate under the chin. Interestingly, non-consanguineal kin situates in the proximity of chin (under the lips or under the chin), while consanguineal kin locates on the ipsilateral side of the face (cheek or jaw). As for affinal terms, they overlap with movement of an arc, but instead the initial position of the sign does not contact the face. Location of the initial position of the lexical unit specifies kin relation of consanguineal and non-consanguineal collateral and affinal kin terms.

Handshape specifies collateral and affinal kin terms. As for most kin terms presented in Table G13, they produce using an index finger. However, two other types of kin terms do not overlap index finger, but instead convey using different handshapes. Overlapped with an arc movement, the first type expresses using a fist with an extended thumb, marking non-

consanguineal collateral kin younger than the Ego's father. IPSL-Karachi discriminates terms of *husband of father's younger sister* and *wife of father's younger brother*, but not older than the Ego's father or by maternal lineage.

The second type concerns a kin form, *brother's wife*, mapped to a different conceptual framework; illustrating no phonological overlap as described in other consanguineal, non-consanguineal, or affinal terms. The construction of *brother's wife* is [woman] [one-hand-grasp], and it appears to refer to either paternal or maternal relations. This behavior illustrates asymmetry compared to other collateral and affinal kin terms.

Within affinal terms referring to *brother-in-law* and *sister-in-law*, the paradigm reveals that these terms discriminate based on the relation of husband, wife, or brother. If the kin relation connects to the wife, then terms constructed using spousal terms preceding an affinal morpheme. As for husband's brother and sister, they are referred by affinal terms expressed by sibling terms preceding an affinal term. Except for *brother's wife*, whose term construct using a female person term preceding to create a distinct form specifying the relationship of the kin member as the wife of the Ego's brother. Although these terms construct with overt signs, asymmetry reflects in *brother's wife* as it conveys lexemes of person term and a distinct form, different from other terms expressed with either sibling or spousal terms. As for affinal terms other than *brother's wife*, the initial lexeme specifies the relationship to the Ego preceding an affinal morpheme.

According to the Karachi dictionary, gender is salient in all IPSL-Karachi kin terms, except for one kin term, *relatives*. The form *relatives* does not share any phonological structure

observed in IPSL-Karachi male and female kin terms. The exploitation of person terms and parental terms produces effective kinship terminology constructs in ISPL-Karachi. Except for paternal terms, most IPSL-Karachi kin terms are based on person terms. While person terms encode the semantic property of gender, the function of person terms in Karachi kinship terminology remains undetermined regarding whether these person terms have grammaticalized enough to function as gender marking in Karachi's kinship terminology. There appears no evidence of initialized handshapes in ISPL-Karachi kinship lexicon.

Mongolian Sign Language

The 13 kin terms identified in Mongolian Sign Language reveal many constructions based on the forms of man and woman. Both person terms of man and woman are situated on the upper cheek near the ear. The phonological structure of man is produced with a handshape of the middle finger touching the thumb, extending the index, ring, and pinky fingers. Six kin terms: *son*, *daughter*, *(elder) brother*, *(elder) sister*, *younger brother*, and *younger sister* are expressed sequentially with person terms as shown in Appendix G5 Table G14.

Table G14

Mongolian kin terms

Male Kin Term	Person Term	Lexical Unit	Female Kin Term	Person Term	Lexical Unit
<i>son</i>	[<i>male</i>]	[<i>baby</i>]	<i>daughter</i>	[<i>female</i>]	[<i>baby</i>]
<i>elder brother</i>	[<i>male</i>]	[<i>person-whose-height-is-tall: elder</i>]	<i>elder sister</i>	[<i>female</i>]	[<i>person-whose-height-is-tall: elder</i>]
<i>younger brother</i>	[<i>male</i>]	[<i>person-whose-height-is-short: younger</i>]	<i>younger sister</i>	[<i>female</i>]	[<i>person-whose-height-is-short: younger</i>]

The pattern reveals that Mongolian kin terms construct using [person term] [*baby*]; [person term] [*age-of-referent*].¹⁰² Within the sequence of two lexical units; person terms are

¹⁰² According to Mongolian Sign Language dictionary, the forms of *brother* and *sister* were glossed as *brother* and *sister*, but the signed constructions sequentially form with two overt lexemes [person term] [person-whose-height-is-tall: *elder*]; suggesting a better translation as *elder brother* or *elder sister*. The glossing into English

realized prior to other lexical units. There is no lexical entry for *boy* and *girl* in the Mongolian Sign Language dictionary; indicating that age is not specified in person terms denoting either adult and young person in Mongolian Sign Language.

Out of 13 kin terms, only one kin term retains partial phonological structure of person terms. The Mongolian form of *mother* overlaps phonologically by retaining location of the person term of *woman*, suggesting the possibility that *mother* is semantically derived from *woman*. However, there is another explanation for the form of *mother*. The form of *mother* may be iconically motivated according to cultural specific characteristic of a Mongolian mother, which may not be easily recognized by members of Western cultures. Examination of first and second ascending lineal kin terms explains this further.

The category of first and second ascending lineal kin terms depicts no phonological overlap with the forms of *man* and *woman*. Three kin terms: *father*, *grandfather* and *grandmother*, convey a lexical unit of different phonological form. Iconic attributions motivate these familial members. The form of *father* uses an index finger moving sideways on the upper lip in reference to the iconic attribution of a mustache. As for *grandfather*, the form illustrates the iconic feature of a beard. The form of *grandmother* is realized with tips of the thumb and index finger touching the ends of the mouth, moving down. This form appears to illustrate the iconic characteristic of deep marks of the jowls associated with grandmothers. Selected salient

could be misleading, but this has to be consulted with Mongolian signers to determine what these signs refer to: either as a generic reference for *sister* (no age involved) or *elder sister*.

characteristics of iconic attributions associated with *father*, *grandfather*, and *grandmother* function as metonymic components determined by the Mongolian Deaf.

Another category of kin terms concerns two forms of *relatives*. Realized in neutral space, initialized handshapes of one handed ‘X’ (curved index finger) and two-handed ‘X’ (making a cross by both index fingers) according to the Mongolian alphabet produce both forms of *relatives*, suggesting markedness (or a marked category). Furthermore, the semantic domain of *relatives* does not overlap with Mongolian person terms.

Person terms productively construct Mongolian kinship terminology except for terms of *father*, *grandfather*, *grandmother*, and *relatives*. Person terms embed the semantic property of gender; but without enough grammaticalization to determine gender marking in Mongolian’s kinship terminology. While most Mongolian kin terms have a salient reference to gender, both lexical variants of the kin term, *relatives*, contain no reference to gender. Other kin terms, *father*, *grandfather*, and *grandmother*, do not share the phonological structure seen in Mongolian male and female kin terms, suggesting other conceptual domains frame the motivation for constructing these kin terms. There appears to be little or no evidence of grammatical markings in Mongolian kinship lexicon, except for the exploitation of person terms in constructing kin terms in Mongolian Sign Language.

Nepali Sign Language

Nepali Sign Language identifies 58 kin terms.¹⁰³ The organization of Nepali kin terms distinguish gender; matrilineal or patrilineal lineage; consanguineal or affinal relations; birth order; age in relation to Ego; age in relation to relative of Ego (Green, 2008).

Iconic properties motivate person terms; constructed in two lexical units of gender marking and a term for *person*. The male person term maps to iconic descriptions of a mustache, denoting *male* in the initial position preceding movement to the final position of *human*. The form for *boy* contains no phonological overlap with the form of *man*. *Boy* is realized with a bent hand making two arc movements near the ipsilateral forehead. With no phonological overlap observed between *boy* and *man*, the form for *boy* maps to a different domain than that of *man*.

Two lexical variants of female person term exist. The first variant of *woman* expresses the form of *female* with a full hand brushing down on the ipsilateral cheek; realized in the initial position moving then to the final position of the term for *human*. Similar to the first variant constructed with *human* in the final position, the second variant of *woman* conveys a pointing to the ipsilateral nose, reflecting a nose piercing attributed to Nepali women. The female person term also semantically extends to *girl*, but instead *girl* does not express the form of *person* as the

¹⁰³ Green (2008) identifies 60 kin terms in Nepali Sign Language; including terms for *baby* and *orphan*. These two terms are not included in this analysis.

term for *female* stands alone as a free-standing morpheme.¹⁰⁴ Green (2008) reports that the term for *person* may be expressed optionally, whereas the first lexical unit marks gender in Nepali Sign Language. The terms for *man* and *woman* construct from two lexical units where gender marking is positioned initially, while the term for *person* follows in the final position as [gender marking] [*person*].

Out of 58 kin terms, 54 terms mark gender; marking *male* in 27 male kin terms and *female* in 27 female kin terms. Gender marking of spousal terms constructs from using *jointed hands* in the final position (Green, 2008). Four other terms that do not mark gender include: *family*, *relatives*, *co-wife*, and one variant of *daughter*. Two variants of *daughter* exist where one maps to feminine marking, while the second variant constructs from using a full handshape brushing on the ipsilateral cheek - derived from another lexical variant of *woman*. Although one variant of *daughter* does not express gender marking, this term for *daughter* does semantically encode *feminine*. The term for *co-wife* evokes the semantic property of *feminine* encoded as a female referent, even though *co-wife* does not contain gender marking. The term for *co-wife* constructs from two forms [*marriage*] [*second*] (Green, 2008). Both terms for *family* and *relatives* do not mark gender as these forms derive from different conceptual domains. The form for *family* depicts an iconic description of *house roof* positioned initially in three lexeme

¹⁰⁴ Green identifies gender marking as unbound morphemes since they may be realized independently as a free-standing morpheme.

constructions. As there is no gender marking in these four kin terms, motivation maps to different conceptual domains. Otherwise, gender marking robustly constructs Nepali kin terms.

Ascending lineal terms mark gender from their initial positions, constructed from one or more lexical units. The pattern of ascending lineal terms is shown in Appendix G5 Table G15.

Table G15

Constructions of ascending lineal terms in Nepali Sign Language

Kin Term	1st Lexical Unit	2 nd Lexical Unit	3 rd Lexical Unit	4 th Lexical Unit
<i>father</i>	<i>masculine</i>	<i>parent</i>		
<i>mother</i>	<i>feminine</i>	<i>parent</i>		
<i>grandfather</i>	<i>masculine</i>	<i>old-person</i>		
<i>grandmother</i>	<i>feminine</i>	<i>old-person</i>		
<i>great-grandfather</i>	<i>masculine</i>	<i>parent</i>	<i>old-person</i>	<i>old-person</i>
<i>great-grandmother</i>	<i>feminine</i>	<i>parent</i>	<i>old-person-with-upward-arc</i>	<i>old-person-with-upward-arc</i>

As gender marking occurs in all ascending lineal terms, the forms following gender marking specify ascending lineal kin referents. The parental terms for *father* and *mother* contains a form denoting *parent*; conveyed using an extended index finger located on the ipsilateral point of the chin. Third ascending lineal terms do not overlap with the form of *parent* but instead maps to an iconic form of *old-person*. The formal description of a curved index finger evokes the semantic property of *old-person*; indicating semantic extension took place.¹⁰⁵ Grandparental terms sequentially construct from [gender marking] [*old-person*]. Fourth ascending lineal terms convey four lexemes; constructed using [gender marking] [*parent*] and reduplication of [*old-person*]. For instance, *great-grandfather* would be semantically expressed as *father's old-person*

¹⁰⁵ Green (2008) proposes two possible explanations for grandparental terms. The first explanation is phonological reduction by no formal expression of *parent* while the second explanation rests on semantic extension of *old person* to *grandparents*.

old person; indicating the formal property of reduplication marks degree of generation separation between Ego and great-grandfather. The count of four lexical units indicates a marked category as these great-grandparental terms are more remote in terms of lineal distance compared to other less remote distant kin terms.

Sibling terms sequentially construct from two overt lexemes of [gender marking] [*age-relative-to-Ego*]. Constructions of sibling terms are described in Appendix G5 Table G16.

Table G16

Constructions of sibling terms in Nepali Sign Language

Male Sibling Terms	Gender Marking	Age Relative to Ego	Female Sibling Terms	Gender marking	Age Relative to Ego
<i>elder brother</i>	<i>masculine</i>	<i>person-whose-height-is-tall: elder</i>	<i>elder sister</i>	<i>feminine</i>	<i>person-whose-height-is-tall: elder</i>
<i>younger brother</i>	<i>masculine</i>	<i>person-whose-height-is-short: younger</i>	<i>younger sister</i>	<i>feminine</i>	<i>person-whose-height-is-short: younger</i>

Nepali differentiates gender and age of the sibling relative to the Ego as described in these four sibling terms. The reference of age maps to a metaphorical domain where the height of a person reflects age. The tall height of a person interprets as *elder* as the height maps to a concrete domain of UP to draw from an abstract domain of MORE, while the short height denotes *younger* as the height maps to the concrete domain of DOWN to retrieve the meaning of LESS in the abstract domain. The Nepali dictionary reports no terms that refers to *sibling* (gender-neutral and relative-age neutral), *brother* (relative-age neutral), or *sister* (relative-age neutral).

Distinctions of gender and birth order are encoded in sibling and offspring terms. In another set of offspring terms, the forms sequentially construct from gender marking with another lexical unit in the final position. Constructions of sibling and offspring terms are described in Appendix G5 Table G17.

Table G17

Constructions of descending lineal and co-lineal kin terms in Nepali Sign Language

Male Kin Terms	1 st Lexical Unit	2 nd Lexical Unit	Female Kin Terms	1 st Lexical Unit	2 nd Lexical Unit
<i>eldest son; brother</i>	<i>male</i>	<i>[thumb + person-whose-height-is-tall]</i>	<i>eldest daughter; sister</i>	<i>female</i>	<i>[thumb + person-whose-height-is-tall]</i>
<i>second eldest son; brother</i>	<i>male</i>	<i>index finger</i>	<i>second eldest daughter; sister</i>	<i>female</i>	<i>index finger</i>
<i>third eldest son; brother</i>	<i>male</i>	<i>middle finger</i>	<i>third eldest daughter; sister</i>	<i>female</i>	<i>middle finger</i>
<i>fourth eldest son; brother</i>	<i>male</i>	<i>ring finger</i>	<i>fourth eldest daughter; sister</i>	<i>female</i>	<i>ring finger</i>
<i>youngest son; brother</i>	<i>male</i>	<i>[pinky finger + person-whose-height-is-short]</i>	<i>youngest daughter; sister</i>	<i>female</i>	<i>[pinky finger + person-whose-height-is-short]</i>
<i>son</i>	<i>male</i>	<i>baby</i>	<i>daughter</i> ¹⁰⁶	<i>female</i>	<i>baby</i>
<i>grandson</i>	<i>male</i>	<i>initialized handshape of 'NA'</i>	<i>granddaughter</i>	<i>female</i>	<i>initialized handshape of 'NA'</i>
<i>great-grandson</i>	<i>male</i>	<i>dominant hand: initialized handshape of 'PA'</i> <i>non-dominant hand: baby</i>	<i>great-granddaughter</i>	<i>female</i>	<i>dominant hand: initialized handshape of 'PA'</i> <i>non-dominant hand: baby</i>

Within the domain of descending lineal and co-lineal kin terms, Nepali marks gender to differentiate between male and female referents. Birth order of offspring and sibling terms is

¹⁰⁶ There are two variants of *daughter*. Within the paradigm, the formal property of *daughter* overlaps with the feminine marking while the second variant overlaps with the first lexical unit of *woman*.

encoded by numeral marking. The selected finger of the non-dominant hand specifies the birth order of the offspring. As for the second, third, and fourth eldest offspring terms, the dominant hand closes on the selected finger of index, middle, or ring finger to indicate the birth order of the kin referent respectively. In contrast, the terms for *eldest offspring* and *youngest offspring* do not realize with an indexation by the dominant hand on the thumb or pinky finger. These terms overlap with the thumb or pinky finger; mapping to the metaphorical domain of *person-whose-height-is-tall* to encode *eldest offspring* and *person-whose-height-is-short* for *youngest offspring*. The formal description of the metaphorical mapping of *person-height* is identical in the forms of elder and younger sibling terms. The selected finger specifies the birth order of offspring and sibling kin; indicating numeral marking in Nepali offspring and sibling terms.

Nepali contains offspring terms that do not specify birth order; marked only by gender. First descending lineal terms for *son* and *daughter* construct from gender marking in the initial position, while the second lexical unit conveys an iconic description of *baby*. Similar to *son* and *daughter*, third descending lineal terms for *great-grandson* and *great-granddaughter* also realize the second lexeme of *baby* with the non-dominant hand, while the dominant hand maps instead to an initialized handshape of ‘PA’. The formal coding of the initialized handshape of ‘PA’ reflects the orthographic representation in written Nepali; indicating a marked category compared to *son* and *daughter*. In contrast, the second descending lineal terms for *grandson* and *granddaughter* which overlap to an initialized handshape of ‘NA’, express a different formal structure of the second lexeme than seen in first and third descending lineal terms. Descending

lineal terms differentiate by gender in all offspring terms, ranking birth order within a specific domain of offspring terms, and mapping to an iconic form of *baby* in either first or third descending lineal terms except for second descending lineal terms. Second and third descending lineal terms overlap with initialized handshapes; indicating a marked category.

Patterns reveal that descending collateral (*nephew/niece*) kin terms show a similar phonological structure as seen in second descending lineal (*grandchildren*) kin terms. These kin terms mark gender in the initial position. In the set of descending collateral terms, the second lexical unit specifies kin relation by either matrilineal or patrilineal lineage. In contrast, second descending kin terms do not illustrate any distinction by either matrilineal or patrilineal lineage. However, the phonological structure expressed in the second lexical unit reveals a shared semantic domain with descending patrilineal collateral kin terms. The shared domain rests on the initialized handshapes codified by the second lexemes as they map to orthographic Nepali forms. Constructions of descending collateral and grandchildren terms are described in Appendix G5 Table G18.

Table G18

Constructions of descending collateral and second descending lineal kin terms in Nepali Sign Language

Lexical Units		1 st Lexical Unit		2 nd Lexical Unit	
Phonological construction	Gender Marking	Handshape	Location: Initial Position	Location: Final Position	Movement
<i>nephew</i> <i>sister's son</i>	<i>masculine</i>	initialized handshape of 'BHA'	contralateral forearm	contralaterally neutral space	1 straight movement
<i>niece</i> <i>sister's daughter</i>	<i>feminine</i>	initialized handshape of 'BHA'	contralateral forearm	contralaterally neutral space	1 straight movement
<i>nephew</i> <i>brother's son</i>	<i>masculine</i>	initialized handshape of 'BHA'	center neutral space	contralateral forearm	1 arc movement
<i>niece</i> <i>brother's daughter</i>	<i>feminine</i>	initialized handshape of 'BHA'	center neutral space	contralateral forearm	1 arc movement
<i>grandson</i>	<i>masculine</i>	initialized handshape of 'NA'	center neutral space	contralateral forearm	1 arc movement
<i>granddaughter</i>	<i>feminine</i>	initialized handshape of 'NA'	center neutral space	contralateral forearm	1 arc movement

Patterns in descending collateral and second descending lineal terms reveal phonological overlap in the second lexical unit. As for descending collateral terms, they all express with the same handshape of extended index and middle fingers codified as an initialized handshape of ‘BHA’. Terms for *grandson* and *granddaughter* realize with an extended index finger; expressing an initialized handshape of ‘NA’. The initialized handshape itself differentiates between lineal and collateral relationship. Terms for *brother’s son*, *brother’s daughter*, *grandson*, and *granddaughter* express in the same location and movement; moving in an arc from the center of neutral space to contralateral forearm. Terms for *sister’s son* and *sister’s daughter* situate on contralateral forearm positioned initially, moving straight away into contralateral neural space. As location and movement is co-articulated, they discriminate between matrilineal and patrilineal relationship in descending collateral terms. While descending patrilineal collateral terms overlap in location and movement with terms for *grandson* and *granddaughter*, they differ by initialized handshapes to mark lineal or collateral relationship. Although there are distinctions in types of co-articulation of location and movement, these kin terms all contact on contralateral forearm and appear to be motivated by either initialized handshape and/or descending relationship.

Ascending collateral kin terms contain distinctions of gender, matrilineal or patrilineal relationship, consanguineal or affinal relationship, and age relative to Ego. Based on the formal

properties described in ascending collateral terms, they categorize into two sets illustrated in Appendix G5 Table G19 and Table G20.

Table G19

First set of ascending collateral terms in Nepali Sign Language

Lexical Units	1 st Lexical Unit	2 nd Lexical Unit	3 rd Lexical Unit
<i>father's elder brother</i> <i>thulaa baa</i> 'big father'	<i>big</i>	<i>masculine</i>	<i>parent</i>
<i>wife of father's elder brother</i> <i>thuli aamaa</i> 'big mother'	<i>big</i>	<i>feminine</i>	<i>parent</i>
<i>husband of mother's sister</i> <i>saanaa baa</i> 'small father'	<i>small</i>	<i>masculine</i>	<i>parent</i>
<i>mother's (younger) sister</i> <i>saani aamaa</i> 'small mother'	<i>small</i>	<i>feminine</i>	<i>parent</i>

Unlike other domains of Nepali kin terms, the first set of ascending lineal terms does not construct gender marking in the initial position, but instead expresses property terms for *big* and *small* in their construction prior to gender marking and a bound morpheme of *parent*.¹⁰⁷ Green (2008) explains that the incorporation of augmentative and diminutive property terms in this set of kin terms are motivated by written Nepali kin terms for *thulaa baa* 'big father', *thuli aamaa*

¹⁰⁷ The handshape of a spread full hand of '5' expressed in the initial position changes to a closed flat hand in the final position; marking patrilineal relationship similar to terms for *father's elder brother* and *wife of father's elder brother*. Maternal terms for *mother's (younger) sister* and *husband of mother's sister* convey a similar formal property of the handshape observed in patrilineal terms, but reverse the order of the realization of handshape.

‘big mother’, *saanaa baa* ‘small father’, and *saani aamaa* ‘small mother’. The terms for *big* and *small* specify matrilineal or patrilineal relationship within this set of four kin terms; however do not differentiate between consanguineal and affinal relations. Based on this domain of kin terms, it suggests that Nepali Sign Language experiences language borrowing by structural mapping of spoken/written Nepali kin terms.

The second set of ascending collateral terms does not construct from *parent*, *big*, or *small*, but instead overlaps with an initialized handshake. These collateral terms construct gender marking in the initial position preceding the second lexical unit of an initialized handshake; specifying matrilineal or patrilineal lineage as shown in Appendix G5 Table G20.

Table G20

Construction of ascending collateral terms in Nepali Sign Language

Kin Term	1 st Lexical Unit	2 nd Lexical Unit		
Formal Properties	Gender Marking	Handshape	Location	Movement
<i>father's sister</i> <i>phupajyu</i>	<i>masculine</i>	initialized handshake of ‘NA’	neutral space	trilled
<i>father's sister's husband</i> <i>phupu</i>	<i>feminine</i>	initialized handshake of ‘NA’	neutral	trilled
<i>father's younger brother</i> <i>kaakaa</i>	<i>masculine</i>	non-initialized handshake	neutral space	trilled
<i>father's younger brother's wife</i> <i>kaaki</i>	<i>feminine</i>	non-initialized handshake	neutral space	trilled

Although this set of ascending collateral terms overlaps with initialized handshapes, these initialized handshapes are not motivated by written Nepali forms (Green, 2008). For instance, the term for *father's sister* expresses with a handshape of 'NA' whereas the written form is *phupu*; demonstrating no structural mapping of *na* seen in written Nepali. As for the handshape of *father's younger brother* and *father's younger brother's wife*, it is not initialized according to the Nepali alphabetic system (Green, 2008).¹⁰⁸ The first lexeme marks gender, while the second lexeme specifies kin relations; illustrating distinctions by age in relation to relative of the Ego and consanguineal and affinal relations.

The domain of affinal kin terms conveys distinctions of gender, matrilineal or patrilineal lineage, and age in relation to the Ego. All affinal terms mark gender, constructed in the initial position, as described in Appendix G5 Table G21.

¹⁰⁸ Green (2008) identifies this phenomenon as non-initial kin constructions, as similar to the domain of other terms that do realize initialized handshapes, these kin terms do not overlap with initialized handshapes.

Table G21

Construction of affinal terms in Nepali Sign Language

Male Affinal terms	1 st Lexical Unit	2 nd Lexical Unit			Female Affinal Terms	1 st Lexical Unit	2 nd Lexical Unit		
Formal Properties	Gender Marking	Initialized Handshape	Location	Movement		Gender Marking	Initialized Handshape	Location	Movement
<i>husband's younger brother dewar</i>	<i>masculine</i>	DA	neutral space	down arc	<i>husband's sister dewaraani</i>	<i>feminine</i>	DA	neutral space	down arc
<i>wife's brother saalaa</i>	<i>masculine</i>	SA	neutral space	down arc	<i>wife's younger sister saali</i>	<i>feminine</i>	SA	neutral space	down arc
<i>elder sister's husband bhinaaju</i>	<i>masculine</i>	BHA	neutral space	up arc	<i>elder brother's wife bhaauju</i>	<i>feminine</i>	BHA	neutral space	up arc
<i>younger sister's husband jwaai</i>	<i>masculine</i>	JA	neutral space	down arc	<i>younger brother's wife buhaari</i>	<i>feminine</i>	BA	neutral space	down arc
<i>wife's elder brother JeThaan</i>	<i>masculine</i>	JA	neutral space	up arc	<i>husband's elder brother's wife</i>	<i>feminine</i>	JA	neutral space	up arc

<i>father-in-law</i> <i>sasuraa</i>	<i>masculine</i>	SA	neutral space	sagittal	<i>jeThaan</i> <i>mother-in-law</i> <i>saasu</i>	<i>feminine</i>	SA	neutral space	sagittal
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Affinal terms overlap with an initialized handshape according to Nepali's alphabet; specifying matrilineal or patrilineal relationship. However, in terms of *father-in-law* and *mother-in-law*, they do not differentiate by matrilineal and patrilineal lineage, but instead function as a classificatory term constructed with gender marking positioned initially. This set of affinal terms undergoes structural mapping from written Nepali forms to formal expressions of initialized handshape; indicating a marked category. Patterns reveal that initialized handshape productively construct affinal terms motivated by written Nepali forms.

The co-articulation of location and movement marks relative age. Situated in neutral space, the upward arc movement marks *elder* while downward arc movement denotes *younger*. Movement co-articulates with location; framing a metaphorical mapping. As for terms for *father-in-law* and *mother-in-law*, the hand moves sagittally from the face to neutral space; mapping to a different semantic domain than other affinal terms. Affinal terms reveal an intersection of descriptive kin relations marked by initialized handshape, and relative age marked by the co-articulation of location and movement.

Green (2008) compared both sets of kin terms in Nepali Sign Language and spoken Nepali; finding that Nepali Sign Language contains identical types of distinctions as in spoken Nepali kin terms. Green found that structural and semantic mapping observed in signed Nepali kin terms drew from the domain of written Nepali kinship terminology. As signed Nepali kin terms appear to encode similar distinctions found in written Nepali kin terms, signed Nepali kin terms form by derivational morphology in which these morphological forms map to various

semantic domains unique to Nepali Sign Language. For instance, all kin terms mark by gender; forming pairs such as *mother-father*, *father's elder brother-father's elder brother's wife*, etc except for one pair that construct from the same initialized handshape of 'JA' for *wife's elder brother* and *husband's elder brother's wife*. In turn, the Nepali kinship system is preserved in Nepali Sign Language (Green, 2008).

Nepali Sign Language contains the largest set of kinship terminology of the signed languages examined in this study. Most kin terms specify kin relations by gender; matrilineal or patrilineal lineage; consanguineal or affinal relations; birth order; age in relation to the Ego; age in relation to relative of the Ego. Nepali kin terms are productively constructed with gender marking and semantically motivated by person terms. Affinal terms and one set of ascending collateral terms exploit initialized handshapes in their construction.

Tibetan Sign Language

Tibetan Sign Language reports 13 kin terms that include constructions with person terms for sibling terms. Other kin terms express distinct forms; indicating these forms map to semantic domains other than person terms, differentiating kin relations in parental and first ascending collateral terms.

The form of *man* realizes with an index finger moving straight from the center to the ipsilateral side of the upper lip; attributing to an iconic description of a mustache associated with men. Retaining the iconic property of a mustache, the form *father* locates on the upper lip; internally opening both closed index finger and thumb to an extended form. Both forms *man* and *father* overlap in location; differentiating slightly in handshape and movement. In contrast, the term *grandfather* expresses an iconic form of a long beard with a full hand moving down from the lips to neutral space. Tibetan Sign Language exploits the physical description of mustache or beard to construct male person and first and second ascending kin terms.

The form of *woman* realizes with a curved hand; moving down from the ipsilateral ear to the ipsilateral chest. The form *woman* probably is motivated by an iconic description associated with cultural images either of long hair or a headdress worn by Tibetan women. The form *mother* contains no phonological overlap with the form *woman*; realizing with an index finger pointing to the lips. The term *grandmother* forms with extended index finger and thumb; expressing by an internal movement of opening and closing both fingers located at the ipsilateral eye. On the other hand, these female terms do not show any phonological overlap with the term *man*, nor do

female ascending lineal kin terms show any phonological overlap with the term *woman*. All female terms *woman*, *mother* and *grandmother* may be iconically motivated. However, it remains unclear from a Western perspective what the iconic schema manifested in these forms is.

Person terms motivate constructions of sibling terms; expressed by two overt lexemes in sequence: [person term] [*relative-age*]. Constructions of sibling terms are described in Appendix G5 Table G22.

Table G22

Construction of sibling terms in Tibetan Sign Language

Male Kin Term	Person Term	Relative Age	Female Kin Term	Person Term	Relative Age
<i>elder brother</i>	<i>male</i>	<i>person-whose-height-is-tall: elder</i>	<i>elder sister</i>	<i>female</i>	<i>person-whose-height-is-tall: elder</i>
<i>younger brother</i>	<i>male</i>	<i>person-whose-height-is-short: younger</i>	<i>younger sister</i>	<i>female</i>	<i>person-whose-height-is-short: younger</i>

There is no free-standing form to denote *sibling*, *brother*, or *sister*, but instead Tibetan Sign Language discriminates siblings by gender and age of the sibling relative to Ego. The reference of age maps to a metaphorical domain where the height of a person reflects age. The tall height of a person interprets as *elder* as the height maps to a concrete domain of UP to draw an abstract domain of MORE, while the short height denotes *younger* as the height maps to the concrete domain of DOWN to retrieve the meaning of LESS in the abstract domain. Both terms for *elder* and *younger* contain double mappings: UP IS MORE: ELDER IS MORE; DOWN IS LESS: YOUNGER IS LESS.

Tibetan Sign Language differentiates first ascending collateral terms by familial lineage. The terms for *father's brother (paternal uncle)* and *father's sister (paternal aunt)* overlap in location and possibly movement, but not in handshape. The form *father's brother* expresses with a slightly bent full hand, moving from the top of the forehead to the back of the head. The form *father's sister* moves in a three-quarter circle from the top end to lower part of the back of the head with a bent index and thumb. Both terms *father's brother* and *father's sister* are likely to be motivated by iconic descriptions associated with paternal kin members.

Maternal collateral kin terms overlap in handshape and movement, but not in location. The term *mother's father (maternal uncle)* forms with a full hand moving diagonally; following the contralateral side of the upper jaw to the center of the chin. The term *mother's sister (maternal aunt)* realizes with a full hand moving diagonally from contralateral clavicle to the ipsilateral waist. The phonological overlap of a diagonal movement and a full hand denotes maternal first ascending collateral kin.

The form *relatives* realizes with two compositional units. First, an extended index finger and thumb press together, then move in an arc from the center to the ipsilateral area in neutral space. The second compositional unit contains internal movement of the index finger and thumb by opening and closing once; orientating the palm up. No lexical entry for *family* is reported in Tibetan Sign Language.

Tibetan Sign Language specifies kin relations based on paternal and maternal lineages as observed in kin terms for father's sister, father's brother, mother's sister, and mother's brother.

Within a specific domain of sibling terms, person terms motivate construction by a semantic domain expressing age of referent in a sequence of two lexical units. The remaining set of Tibetan kin terms do not construct from person terms; however, parental and grandparental terms exploit iconicity to express conceptual domains other than person terms.

APPENDIX G6: DESCRIPTION OF FAR EAST ASIA SIGNED LANGUAGES KIN TERMS

Chinese Sign Language

Kinship terminology in Chinese Sign Language (Zhōngguó Shǒuyǔ, ZS) is constructed in several different ways as illustrated by 37 reported kin terms. Chinese kin terms robustly produce using person terms and parental terms; overlapped with initialized handshapes.

The term for *man* expresses with a full hand moving sagittally and bidirectionally by the ipsilateral side of upper head. The form for *woman* depicts an iconic description of an earring typically associated with women as the index finger and thumb contact on ipsilateral ear. Offspring terms are motivated by the person terms. Both terms for *daughter* and *son* sequentially constructs from two lexical units: [person term] [*person-whose-height-is-short*]. The Chinese dictionary indicates that offspring terms may refer as *girl* and *boy*.

Chinese Sign Language constructs kin terms with two or three lexical units in a sequence; exploiting *man*, *woman*, *father*, *mother*, *elder-sibling*, and *younger-sibling*; categorized into two sets of constructions. The first set contains a person term expressed in the initial position preceding other lexemes within the construction as described in Appendix G6 Table G23.

Table G23

Kin terms constructed with person terms in Chinese Sign Language

Male Kin Term	1 st Lexical Unit	2 nd Lexical Unit	Female Kin Term	1 st Lexical unit	2 nd Lexical Unit
ZHANGFU 'husband'	<i>marry</i>	<i>man</i>	QIZI 'wife'	<i>marry</i>	<i>woman</i>
GEGE 'elder brother'	<i>elder-sibling</i>	<i>man</i>	JIEJIE 'elder sister'	<i>elder-sibling</i>	<i>woman</i>
DIDI 'younger brother'	<i>younger-sibling</i>	<i>man</i>	MEIMEI 'younger sister'	<i>younger-sibling</i>	<i>woman</i>
ERZI 'son'	<i>man</i>	<i>person-whose-height-is-short</i>	NUER daughter	<i>woman</i>	<i>person-whose-height-is-short</i>
SUNZI 'grandson'	<i>initialized handshape: S</i>	<i>person-whose-height-is-short</i>	SUNNU granddaughter	<i>initialized handshape: S</i>	<i>woman</i>
ZHIZI nephew	<i>initialized handshape: ZH</i>	<i>person-whose-height-is-short</i>			

Person terms motivate constructions of sibling, spousal, and descending lineal terms. Most constructions position person term preceding other lexical units. Person terms motivate construction of sibling terms; expressed by two overt lexemes in a sequence: [person term] [*age-of-referent*]. In contrast, spousal terms position *man* or *woman* in the final position within the two-lexeme constructions along with the term for *marry*. The form of *marry* metonymically depicts two persons bowing to each other reflecting the rite of marriage performance; constructed with an overt term for *woman* or *man*. The pattern shows asymmetry in constructions

of *grandson* and *nephew*. These terms for *grandson* and *nephew* do not construct from *man*, but instead exploit the term for *person-whose-height-is-short* as the second lexeme in the construction of *son*. Although the term for *granddaughter* conveys with an initialized handshape of ‘S’ similar to *grandson*, *granddaughter* constructs *woman* in the final position while *son* does not.

Affinal terms also exploit person terms in their construction. Constructions of co-lineal and descending affinal terms are described in Appendix G6 Table G24.

Table G24

Constructions of co-lineal and descending affinal terms in Chinese Sign Language

Male Kin Term	1 st Lexical Unit	2 nd Lexical Unit	3 rd Lexical Unit
JIEFU 'elder sister's husband (brother-in-law)'	<i>elder sibling</i>	<i>woman</i>	<i>ideographic character: 夫</i>
SAOSAO 'elder brother's wife (sister-in-law)'	<i>elder sibling</i>	<i>man</i>	<i>woman</i>
NUXU 'son-in-law'	<i>woman</i>	<i>initialized handshape: X</i>	
XIFUR 'daughter-in-law'	<i>initialized handshape: X</i>	<i>woman</i>	

The Chinese Signed Language dictionary provides only two lexical entries denoting *sister-in-law* and *brother-in-law*; referred to as *elder's sister's husband* and *elder brother's wife*. Both terms construct from three signs: [*elder-sibling*] [person term] [person term]; encoding both age and gender of the referred sibling and gender of the spouse. Neither term overlaps with initialized handshapes. As there are no other lexical entries to refer to younger sibling's spouses,

it is unknown if Chinese kin terms construct affinal terms with terms for *younger-sibling*. In the case of *son-in-law* and *daughter-in-law*, both terms construct from two forms of *woman* and an initialized handshape of ‘X’. The ordering of these two forms specifies the kin relation. The form of *elder-sibling* productively extends to construct other affinal terms.

Person terms do not motivate forms for *father* and *mother*. Chinese nuclear terms for *father*, *mother*, *elder-sibling*, and *younger-sibling* overlap in the same phonological structure, but are differentiated by handshape. The description of handshape specifies kin relation:

- Thumb defines father
- Index finger defines mother
- Middle finger marks elder-sibling
- Pinky finger marks younger-sibling

The selected finger specifies kin relation within the set of nuclear kin terms. Some kin terms incorporate parental and sibling terms; constructing grandparental, collateral, and affinal terms. While sibling terms are differentiated by age, gender is encoded by an overt form of person term following the sibling; specifying either male or female siblings as well their age. The nuclear kin term may be produced sequentially within a construction; positioned initially.

Parental terms productively construct ascending kin terms. While lineal, collateral, and affinal terms are specified by either paternal or maternal lineage, age of referent is only encoded

in consanguineal, paternal male kin terms. The paradigm describes the phonological structure of ascending lineal, collateral, and affinal kin terms as illustrated in Appendix G6 Table G25.

Table G25

Kin terms constructed with parental terms in Chinese Sign Language

Male Kin Term	1 st Lexical Unit	2 nd Lexical Unit	3 rd Lexical Unit	Female Kin Term	1 st Lexical Unit	2 nd Lexical Unit	3 rd Lexical Unit
ZUFU 'grandfather'	<i>initialized handshape: Z</i>	<i>father</i>		ZUMU 'grandmother'	<i>initialized handshape: Z</i>	<i>mother</i>	
WAIZUFU 'maternal grandfather'	<i>outside</i>	<i>initialized handshape: Z</i>	<i>father</i>	WAIZUMU 'maternal grandmother'	<i>outside</i>	<i>initialized handshape: Z</i>	<i>mother</i>
BOFU 'father's elder brother'	<i>initialized handshape: B</i>	<i>father</i>		BOMU 'father's brother's wife'	<i>initialized handshape: B</i>	<i>mother</i>	
JIUFU 'mother's brother'	<i>initialized handshape: J</i>	<i>father</i>		JIUMU 'mother's brother's wife'	<i>initialized handshape: J</i>	<i>mother</i>	
SHUFU 'father's younger brother'	<i>initialized handshape: SH</i>	<i>father</i>		SHENMU 'father's younger brother's wife'	<i>initialized handshape: SH</i>	<i>mother</i>	
GUFU 'father's sister's husband'	<i>initialized handshape: G</i>	<i>father</i>		GUMU 'father's sister'	<i>initialized handshape: G</i>	<i>mother</i>	
YIFU 'mother's sister's husband'	<i>initialized handshape: Y</i>	<i>father</i>		YIMU 'mother's sister'	<i>initialized handshape: Y</i>	<i>mother</i>	
GONGGONG	<i>Ideographic</i>	<i>ideographic</i>		POPO	<i>initialized</i>	<i>mother</i>	

'husband's father' *character:* 公 *character:* 公
YUEFU *distinct form* *father*
'wife's father'

'husband's mother' *handshape:* P
YUEMU *distinct form* *mother*
'wife's mother'

Chinese ascending terms are specified by kin relations to the Ego, primarily overlapped with initialized handshapes according to Chinese's manual alphabet represented by Chinese pinyin. As initialized handshapes are positioned initially in the construction, the terms for *mother* and *father* are conveyed in the final position of the two-lexeme construction: [initialized handshape] [parental term]. The terms for *maternal grandfather* and *maternal grandmother* are similar to other terms for *grandfather* and *grandmother* unspecified by familial lineage. Maternal grandparental terms realize the term for WAI 'outside' preceding other signs; sequentially constructed of three lexical units: [*outside*] [initialized handshape of 'Z'] [parental term]. The term *relatives* also overlaps with an initialized handshape of 'Q' following another distinct term positioned initially in the construction. Ascending kin terms differentiate by specifying consanguineal-affinal relations realized by an initialized handshape and paternal-maternal lineage expressed by the overt form of *father* or *mother*.

In the case of terms for *mother-in-law* and *father-in-law*, these affinal terms produce using initialized handshapes. While *husband's mother* realizes using both initialized handshape and *mother*, the term for *husband's father* is formed by a ideographic character representation of 公 (/gong/) reduplicated twice. Instead of overlapping with initialized handshape, both terms for *wife's father* and *wife's husband* construct from a person term following a distinct form mapped to another conceptual domain. Chinese kin terms overlap to two types of initialized handshapes based on pinyin and ideographic characters.

Chinese Sign Language reveals person terms motivation of nuclear kin terms and some affinal terms, while paternal terms and sibling terms motivate ascending terms. Sibling terms differentiate by age; marked in handshape. Chinese kin terms productively construct from initialized handshapes.

Hong Kong Sign Language

Hong Kong Sign Language reports 15 distinct kin terms with 6 lexical variants; totaling to 22 kin terms identified. Kinship terminology in Hong Kong Sign Language robustly produces using person and parental terms.

The term for *man* expresses with a full hand moving sagittally from the front to back of the ipsilateral side of upper head. The form for *woman* depicts an iconic description of an earring typically associated with women as the index finger and thumb contact on ipsilateral ear. Motivated by the person term, both offspring terms for *daughter* and *son* construct using the lexical unit of *birth* positioned prior to the person term: [*birth*] [person term]. The form for *birth* derives from an iconic representation of giving birth.

Similar to offspring terms, spousal terms also encode gender to discriminate between *husband* and *wife* in a construction of person term and a sign denoting *marry*. The form of *marry* metonymically represents two persons bowing to each other in their ritualized ceremony of marriage. Spousal and offspring terms are produced from two overt lexemes, containing a person term in the final position of the construction.

Person terms do not motivate forms for *father* and *mother*. Terms for *father*, *mother*, *elder-sibling*, and *younger-sibling* overlap in a similar phonological structure; differentiated by handshape. There is a slight distinction in location as *father* and *mother* situate on the mouth while the finger pad of the middle and index finger contact on the chin as described in the paradigm in Appendix G6 Table G26.

Table G26

Phonological structure of nuclear kin terms in Hong Kong Sign Language

Kin Term	Handshape	Location	Movement
<i>father</i>	thumb	mouth	taps twice
<i>mother</i>	index finger	mouth	taps twice
<i>elder-sibling</i>	middle finger	chin	taps twice
<i>younger-sibling</i>	pinky finger	chin	taps twice

The handshape specifies kin relation within the nuclear kin set. Sibling terms encode age, and may specify gender with an overt form of *female* or *male* following the sibling terms. The reference to elder sister and elder brother construct as: [*elder-sibling*] [person term] while younger counterparts realize as: [*younger-sibling*] [person term]. Other variants of sibling terms such as gender may be encoded through mouthing components as described in the Hong Kong dictionary. Forms for *father*, *mother*, *elder-sibling*, and *younger-sibling* function as descriptive terms in Hong Kong Sign Language.

Parental terms motivate other kin terms. The term for *parents* compounds both *father* and *mother*; illustrating lexicalization took place by phonological reduction in movement. The term for *family* is sequentially produced from both parental terms and a term referring to *house*; constructed as: [*father*] [*mother*] [*house*].

Parental terms semantically extend to grandparental terms, and express using two lexical variants. The first variant produces with two overt lexemes: [*old*] [person term]. Similarly the second variant expresses using both terms for *old* and a person term, but produce using a third

lexeme of *outside* positioned initially in the construction and the parental term in the final position of the construction: [*outside*] [*old*] [person term]. Grandparental terms are classificatory as they do not specify patrilineal or matrilineal lineages.

Hong Kong Sign Language contains two kin terms that do not illustrate any phonological overlap with other kin terms. The term for *cousin* does not overlap with either a person term or other kin terms, but maps instead to a different semantic domain. Another term that illustrates no phonological overlap with any other kin terms is *relatives*; producing with a holistic form of a claw hand moving down on the ipsilateral jaw. These terms for *cousin* and *relatives* are classificatory.

Hong Kong Sign Language productively constructs kin terms from person and parental terms. Sibling terms differentiate by age; marked by handshape.

Japanese Sign Language

Most of the 33 kin terms in Japanese Sign Language (Nihon Shuwa, NS) contain morphemes of *woman* and *man*. Among kin terms, NS expresses terms for *woman* and *man* sequentially in constructions of two lexical units. Within the construction of two lexical units, *woman* and *man* occupy the final position. Some kin terms incorporate signs for *woman* and *man* by retaining the handshape form, overlapped with a lexical unit to mark feminine or masculine. Sasaki proposed that handshape functions as a bound morpheme to mark gender (2007, p. 145). According to the current analysis, NS expresses gender through handshape:

- Pinky finger marks feminine
- Thumb marks masculine
- [Thumb + Pinky finger] marks both masculine and feminine

Kin terms express specific reference to gender, but gender marking may be sequenced, overlapped, or semi-overt composition. A few constructions of kin terms realize sequentially as in this example: [*relatives*] [*woman*]. Ascending collateral kin terms for *aunt* and *uncle* incorporate the lexical term *relatives* as there are two lexical variants of *relatives*, *aunt*, and *uncle* as described in Appendix G6 Table G27.

Table G27

Constructions of ascending collateral terms in Japanese Sign Language

Kin Term	1 st Lexical Unit	2 nd Lexical Unit	Kin Term	1 st Lexical Unit	2 nd Lexical Unit
<i>relatives-1</i>	thumb + pinky finger		<i>relatives-2</i>	<i>relatives-2</i>	
<i>uncle-1</i>	<i>relatives-1</i>		<i>uncle-2</i>	<i>relatives-2</i>	thumb
<i>aunt-1</i>	<i>relatives-1</i>	pinky finger	<i>aunt-2</i>	<i>relatives-2</i>	pinky finger

The first lexical variant of *relatives* uses the handshake of ‘Y’ expressed with extended thumb and pinky finger embedding both masculine and feminine marking. Gender is marked by an overt form of *female* following the term for *relatives* while *uncle* does not construct from an overt masculine marking. The second variant of *relatives* sequentially realize with a distinct form preceding an overt form of gender marking.¹⁰⁹ The classificatory term for *relative* specifies gender by an overt form for either *male* or *female*.

Within a lexical unit, gender marking may be overlapped with other phonological aspects as illustrated in NS’s sign: *grandfather*. Some kin terms are composed of lexicalized compounds that do not realize as a holistic form; not entirely two distinct forms, but retaining compositional qualities retaining partial overt gender marking labeled as semi-overt. The semi-overt

¹⁰⁹ The term for *relatives-2* forms by an index finger wrapped on the thumb moving from the cheeks to neutral space; mapping to another semantic domain.

construction of *mother* is produced sequentially with an arc movement connecting a bound morpheme of [*blood relation*]¹¹⁰ and a lexical morpheme [*woman*].¹¹¹

Appendix G6 Table G28 describes kin terms marking gender as overlapped or semi-overt. Although NS renders gender in kin terms; morphological alternatives are included.

¹¹⁰ There is no lexical entry for *blood relation* in Japanese Sign Language dictionary, suggesting the form within constructions of kin terms functions as a bound morpheme. This finding reinforces the claim of Sasaki that *blood relation* functions as a bound morpheme in *mother*, *father*, *grandfather*, and *grandmother* (2007, p. 145).

¹¹¹ This may function as a compound. Closer examination is needed to determine whether this lexicalized process is a compound or semi-overt construction.

Table G28

Morphological alternations in Japanese kin terms

Kin Term	Morphological Alternation 1	Morphological Alternation 2
<i>parents</i>	thumb + pinky finger	thumb
<i>elder-sister</i>	pinky finger	middle finger
<i>female-siblings</i>	pinky finger + pinky finger	middle finger +middle finger

These examples suggest that while female form is more marked, the masculine form is unmarked. However, as Croft explains “neutral value criteria: the unmarked value is found in neutral contexts, where the contrast between paradigmatic alternatives does not apply for one reason or another” (Croft, 2003, p.100). Observations of spoken languages reveal inconsistent cross-linguistic patterns of neutral value criterion, suggesting they are not factors to consider regarding typological markedness (2003, p. 100). Although gender marking alternatives of neutral value criterion may apply to signed languages, closer examination of the morphological alternatives marking gender reveal language-specific patterns demonstrating how individual signed languages encode the function of gender. The Japanese Sign Language dictionary explains that the exploitation of pinky finger is more common to denote feminine referents. Patterns of gender marking are described in Appendix G6 Table G29.

Table G29

Expression of gender marking in semi-overt and overlapped forms in JSL kin terms

Kin Term	Semi-overt (lexicalized 'compounds')			Overlapped		
	Masculine	Feminine	Masculine +Feminine	Masculine	Feminine	Masculine +Feminine
First ascending lineal kin	<i>father</i> <i>parents</i>	<i>mother</i>	<i>parents</i>			
Second ascending lineal kin	<i>grandfather-1</i>	<i>grandmother-1</i>		<i>grandfather-2</i>	<i>grandmother-2</i>	
Descending kin				<i>son</i>	<i>daughter</i>	<i>grandchild</i>
Descending kin with relative age				<i>oldest-son</i>	<i>oldest-daughter</i>	
Collateral						
Co-lineal 'sibling' terms				<i>elder-brother</i> <i>younger-brother-1</i> <i>younger-brother-2</i> <i>elder-sister-1</i> <i>siblings-male</i> <i>siblings-female</i>	<i>elder-sister-2</i> , <i>younger-sister</i> , <i>siblings-female</i>	
Spousal kin				<i>husband-1</i> <i>husband-2</i>	<i>wife-1</i> <i>wife-2</i>	
Collective kin						<i>family</i> <i>relatives-2</i>

NS conveys first and second ascending lineal kin differently by movement co-articulated on the face with an index finger:

- First ascending kin: Straight movement toward the cheek
- Second ascending kin: Straight movement down on the cheek

With descending kin terms, the age of referent is indicated in terms for birth order as described in Appendix G6 Table G30.

Table G30

Patterns of constructing age of referent in Japanese kin terms

Age of Referent	Handshape	Movement
<i>oldest</i>	[gender marking]	arc moving up
<i>elder</i>	[gender marking]	straight up
<i>younger</i>	[gender marking]	straight down
<i>youngest-child</i>	none	straight down

Kin terms constructed using the term for *oldest*, express gender sequentially after the *oldest* morpheme, while *youngest-child* is a lexical unit with no gender marking. Movement appears to be conceptually mapped from a concrete to an abstract domain: ELDER IS UP and YOUNGER IS DOWN which is also shown in relative age of collateral kin with respect to the referential point of Ego, with the exception that second ascending kin is downward.

Japanese kin terms contain gender marking derived from person terms and age of referent, realized through movement. None of the kin terms in Japanese Sign Language use initialized characters.

Korean Sign Language

Korean Sign Language (Hangul Soo-hwa) reports 31 kin terms motivated by different semantic properties. Kin terms produce using gender marking, relative age, and gender of the Ego referent.

Gender marking robustly constructs Korean kin terms. Gender marking derives from the phonological property of handshape in person terms for *man* and *woman*. Out of 31 kin terms, 24 kin terms overlap with handshapes that specify *male*, *female*, *male sibling*, and *male and female* as illustrated in Appendix G6 Table G31.

Table G31

Handshape constructions of kin terms in Korean Sign Language

Handshape	Denotes	Holistic Form	Construction of Two Overt Forms
thumb	<i>male</i>	<i>father, husband, son, eldest son, youngest child, male relatives</i>	<i>grandfather</i>
middle finger	<i>male sibling</i>	<i>brother, elder brother, younger brother, eldest son</i>	
pinky finger	<i>female</i>	<i>mother, wife, daughter, eldest daughter, sister, elder sister, younger sister, female relatives</i>	<i>grandmother</i>
thumb + pinky	<i>both male and female</i>	<i>parents, relatives</i>	<i>family</i>

Handshape marks gender and also specifies male sibling relations. The thumb marks *male* while the pinky finger marks *female*. The combination of the thumb and pinky denotes both *male* and *female* as observed in the form of *family*. The middle finger specifies *male sibling*.

Parental terms contain gender marking. The form compounds with person term following an overt bound morpheme denoting *blood relation*: [*blood relation* + person term]. This form also constructs *parents* but with the handshape of thumb and pinky finger; embedding both male and female referents. Within the term for *family*, the form for *parents* occupies the final position of the construction. The first lexical unit in *family* maps to the iconic schema of *house*; realized as [*house roof*] [*parents*]. The spousal term depicts both forms for *male* and *female* framed in a joint relationship. Korean does not differentiate between *male spouse* and *female spouse*.

Six offspring terms are specified by gender, age, birth rank, and status as the only offspring. The terms for *daughter* and *son* map to a conceptual domain of *birth* constructed as a holistic form of [gender + *birth*]. The terms for *eldest son* and *eldest daughter* realize using the dominant hand marked by gender contacting on the thumb of the non-dominant hand. The non-dominant thumb indicates *first* in birth order. To refer to a child who is the last born in the family, the form conveys with the dominant hand overlapping with male marking. The dominant hand moves down on to the non-dominant full hand in the neutral space; framing the schema of the last born. While the form for *the only son* realizes using a distinct form and does not contain gender marking, *the only daughter* sequentially constructs using feminine marking: [*the only son*] [*feminine marking*]. Offspring terms map to gender marking with other semantic properties.

Sibling terms differentiate using three types of information about the kin relationship in a holistic form. Gender is marked by both dominant and non-dominant hand. The dominant hand marks the gender of the kin referent while the non-dominant

marks the gender of the Ego. The overlap of movement defines the age relationship between the kin referent and the Ego. The upward arc movement denotes *elder* while downward arc movement refers to *younger*. For instance, to refer a man who has a younger sister, the construction produces a dominant hand with a pinky finger (*female*) moving down (*younger*) while the non-dominant middle finger situates statically (*male sibling*).

There are two forms of *brother* and *sister* that do not specify relative age and gender of the Ego referent. Both forms realize using bidirectional vertical movement of both hands with either middle finger or pinky finger; denoting *male-sibling* and *female-sibling*. These sibling terms appear to be employed differently than other sibling terms that specify relative age and gender of the Ego referent.

Grandparental terms are realized sequentially as with two overt lexemes: [*old*] [gender marking]. Ascending collateral kin terms for *aunt* and *uncle* overlap with the bound morpheme of *relatives*; overlapped with gender marking. Gender marking is exploited in ascending kin terms similar to nuclear kin terms in Korean Sign Language.

There are two lexical entries of *uncle* and *cousin*. These collateral terms are produced by forms representing ideographic Korean characters. This finding illustrates that realizations of characters are employed to construct classificatory terms in Korean Sign Language.

Gender marking is pervasive in Korean kinship terminology. Movement marks relative age in offspring and sibling terms. Sibling terms embed gender marking, relative

age, and gender of Ego referent in one holistic form. Findings illustrate that character-writing forms also motivate Korean kin terms.

APPENDIX G7: DESCRIPTION OF SOUTHEAST ASIA SIGNED LANGUAGES KIN TERMS

Ho Chi Minh City Sign Language

Located in Vietnam, Ho Chi Minh City Sign Language reports 30 kin terms constructed productively with person term mapped to a range of semantic domains. The person term for *man* is motivated by an iconic description of a man's beard. However, the form of *woman* appears to be motivated by a culturally specific, and possibly iconic description framed by Vietnamese cultural framework that is not transparent to the West.

Parental terms semantically derive from person term by overlapping location and with changes of handshape and movement. As *man* expresses with a closed flat hand situated on the chin, *father* overlaps by location using a flat hand. The form *mother* realizes with a full hand located on the ipsilateral cheek while *woman* conveys using bent middle finger and thumb with other fingers extended; moving down twice from upper to lower ipsilateral cheek. Both person and parental terms productively construct kin terms in Ho Chi Minh City Sign Language as described in the paradigm of Appendix G7 Table G32.

Table G32

Kin terms constructed with person and parental terms in Ho Chi Minh City Sign Language

Kin Term	1 st Lexical Unit	2 nd Lexical Unit
<i>son</i>	<i>person-whose-height-is-short</i>	<i>man</i>
<i>daughter</i>	<i>person-whose-height-is-short</i>	<i>woman</i>
<i>youngest child</i>	<i>distinct form</i>	
<i>elder brother</i>	<i>man</i> (derived; holistic form moving in an arc with a closed fist in neutral space in the final position)	
<i>elder sister</i>	<i>distinct form</i>	
<i>younger brother</i>	<i>younger sibling</i>	<i>father</i>
<i>younger sister</i>	<i>younger sibling</i>	<i>woman</i>
<i>spouse</i>	<i>marry</i>	
<i>husband</i>	<i>father</i>	<i>marry</i>
<i>wife</i>	<i>woman</i>	<i>marry</i>

The domain of person terms extends to the constructions of female kin terms for *wife*, *daughter*, and *younger sister* and male kin terms for *son* and *elder brother*. The term for *father* extends to the constructions of *husband* and *younger brother* while there is no semantic extension of *mother* seen in any kin terms; indicating asymmetry in constructing some Ho Chi Minh City kin terms. The offspring terms construct from two lexical units of [*person-whose-height-is-short*] [person term]; encoding gender. In contrast, the gender neutral term for *youngest child* does not overlap to person or parental terms, but instead expresses with an extended pinky finger moving down in the neutral space; mapping to a different semantic domain than seen in other sibling terms.

Sibling terms differentiate by age and gender. The form of *elder sister* is distinct from both forms of *woman* and *mother*; however, *elder sister* resembles the form of *paternal aunt*; realized with a hand grasp on the ipsilateral ear.¹¹² The form for *elder brother* drives from *man* as the initial position forms identical to *man*. However, the final position ends with the fist moving in an arc down in neutral space. The motivation of *man* driving the construction of elder brother suggests a possible lexicalization through a combination of *man* and *older*.¹¹³ The term for *younger sister* constructs from a female person term following a sign for *younger sibling*. Similar to *younger sister*, the term for *younger brother* produces a construction of two signs: *younger sibling* constructed from the term for *father*. Patterns in sibling terms illustrate asymmetry where elder siblings encode both gender and age in a holistic form as opposed to the more marked terms for younger siblings constructed of two lexemes with *younger sibling* and either *female* or *father*.

Ho Chi Minh City Sign Language expresses collateral terms by specifying either paternal or maternal lineage, and relative age in paternal male kin. The paradigm

¹¹² While the forms of *elder sister* and *paternal aunt* appear identical, they differ in selected fingers by grasping the ear. *Elder sister* conveys bent index finger and thumb. As for *paternal aunt*, the hand is more of a closed fist where the ear is situated in between the radial sides of the index finger and the back of the thumb.

¹¹³ The forms of *elder brother* and *elder paternal uncle* resemble identically except for the initial position in the construction. *Elder brother* expresses *man* while *elder paternal uncle* realizes *father*; suggesting that there is a possibility the final position of a closed fist in neutral space may denote *elder*.

describes the phonological structure of collateral kin terms as shown in Appendix G7 Table G33.

Table G33

Constructions of collateral terms in Ho Chi Minh City Sign Language

Kin Term	Handshape	Location	Movement	Palm Orientation
<i>maternal aunt</i>	index finger	ipsilateral forehead → neutral space	an arc with wrist flick down	contralateral → down
<i>paternal aunt</i>	closed fist	ipsilateral ear	stative	contralateral
<i>maternal uncle</i>	index finger	under chin	stative	contralateral
<i>elder paternal uncle-1</i>	closed fist	under chin	stative	toward signer
<i>elder paternal uncle-2</i>	full hand → closed fist	chin → neutral space	an arc down	contralateral
<i>younger paternal uncle</i>	index and middle fingers	chin	taps twice	toward signer
<i>nephew, niece, grandchild</i>	Dominant: bent index finger and thumb Non-Dominant: full hand of B	neutral space selected dominant fingers in between non-dominant hand	Dominant: a straight movement down	Dominant: up Non-Dominant: contralateral

Ho Chi Minh City kinship terminology discriminates ascending collateral terms based on familial lineage. As for female collateral terms, they specify by either maternal or paternal lineage. As for *paternal aunt*, the form contains no phonological overlap with *maternal aunt*, *mother*, or *woman*. However, the form for *paternal aunt* illustrates a similar phonological structure with the form for *elder sister*; differentiated by a slight change in handshape. The form for *maternal aunt* overlaps with the handshape of an index finger observed in *maternal uncle*; suggesting that the index finger specifies maternal lineage. In contrast, the term for *nephew, niece, and grandchild* demonstrates no

phonological overlap with any other kin terms including person terms; indicating the descending kin term maps to a different semantic domain.

All male collateral terms locate on the chin; motivated by the person term for *man*. The differentiation of handshape, movement, and palm orientation discriminate among male collateral terms based on familial lineage and age. While the form for *maternal uncle* marks maternal lineage by the handshape of an index finger, it also overlaps the location of chin area that specifies male kin terms.

Identical to *maternal uncle*, one of two lexical variants of *elder paternal uncle-1* differs by handshape of a closed fist.¹¹⁴ Another lexical variant of *elder paternal uncle-2* exploits the form of *father* but orientates the palm contralaterally as opposed to the palm facing toward the signer as in *father* in the initial position. In the final position, the form for *elder paternal uncle-2* ends with a closed fist; drawing a similar pattern in *elder brother* that suggests a semantic property of *elder*. As for *younger paternal uncle*, the form exploits *man*; differentiated by handshape of extended index and middle fingers. Male kin terms all derive from the form of *man*; overlapping by location. Ho Chi Minh City kinship terminology discriminate collateral terms by familial lineage and age within the paternal uncle terms; revealing less differentiation in maternal kin terms compared to paternal kin terms.

¹¹⁴ The contact of the fist differs between *elder paternal uncle-1* and *grandfather*. The contact of the back of the fingers specifies *elder paternal uncle-1* while the radial side of the index finger refers to *grandfather*.

Grandparental terms optionally may convey using terms for *grandfather* and *grandmother* or free-standing morphemes for *maternal* or *paternal* to specify the kin relation to Ego as described in Appendix G7 Table G34.

Table G34

Grandparental terms in Ho Chi Minh City Sign Language

Kin Term	1 st Lexical Unit	2 nd Lexical Unit
<i>grandfather</i>	<i>grandfather</i>	
<i>grandmother</i>	<i>grandmother</i>	
<i>maternal grandfather</i>	<i>maternal</i>	<i>grandfather</i>
<i>maternal grandmother</i>	<i>maternal</i>	<i>grandmother</i>
<i>paternal grandfather</i>	<i>paternal</i>	<i>grandfather</i>
<i>paternal grandmother</i>	<i>paternal</i>	<i>grandmother</i>

The form of *grandfather* overlaps to a similar semantic domain as *man* and *father*; situating the fist on the chin depicting a man's beard and/or to denote *an old man*. The form of *grandmother* conveys an iconic description of deep jowls on the side of lips realized with curved index finger and thumb. To specify kin relation of grandparental terms, the two-lexeme construction realizes either terms for *maternal* or *paternal* preceding the sign for *grandfather* or *grandmother*. The form of *maternal* conveys with an index finger tracing the ipsilateral cheekbone; indicating a slight possible overlap by location observed in *mother* statically situated on the ipsilateral cheek. The term for *paternal* forms with bent index and thumb moving horizontally from the inner to outer edge of the ipsilateral eye; illustrating no phonological overlap with any person or parental forms. Both terms for *maternal* and *paternal* are distinct from person and parental terms.

The sign for *family* constructs from two compositional units. The sign forms with both hands, first by an iconic description of a house's roof and second with an iconic

schema of a circle. As for *relatives*, the form realizes with both full hands located in upper neutral space in the initial position, then the dominant hand moves diagonally to lower ipsilateral neutral space. Neither of the signs for *family nor relatives* overlap any kin terms, but instead map to different semantic domains in Ho Chi Minh City Sign Language.

Ho Chi Minh City Sign Language robustly exploits person terms to construct kin terms. Ho Chi Minh City differentiates collateral terms by either paternal or maternal lineage, and male ascending collateral terms also discriminate by age. It also has distinct forms expressing *paternal* and *maternal* that are produced with grandparental terms; specifying the kin relation to Ego. Initialized handshapes were not found to be an element of any kin terms in Ho Chi Minh City Sign Language.

Thai Sign Language

In Thai Sign Language (TSL, or Modern Standard Thai Sign Language, MSTSL), 22 identified kin terms include constructions using either person terms or initialization conveyed through orthographic Thai representations with initialized handshapes. Some kin terms map to semantic domains other than person terms and initialization.

The first category of Thai kinship lexicon generally constructs kin terms based on person terms for *man* and *woman*. Spousal kin terms and collateral kin terms are realized sequentially with two lexemes where person terms are produced in the first position within the construction. Spousal kin terms for *husband* and *wife* scaffolds on the construction of [man] [marry] and [woman] [marry]. Collateral kin terms illustrating the construction of PEE CHAI ‘elder brother’, NONG CHAAI ‘younger brother’, PEE SAAO ‘elder sister’, and NONG SAAO ‘younger sister’ are expressed sequentially with two lexemes: [person term] [age-of-referent]. Comparing the order of lexical units in these sibling constructions with written Thai, the order of signed lexical units appears reversed compared to the morphological structure of written Thai.

The signs for *elder* and *younger* exploit the metaphorical double mapping of TALL (UP) IS ELDER to instantiate the abstract concept of *elder*, conveying the tall height of a person to reflect the age to be older. Likewise, SHORT (DOWN) IS YOUNGER conveys the concrete domain of short height mapped to the abstract domain of *younger*. Although person terms appear productive in spousal and collateral kin terms, they do not appear to function as a gender marking. Constructions of two lexical units do not show any

phonological reduction within each lexical unit and/or between both lexical units, indicating that lexicalization has not yet taken place.

The first ascending lineal kin (parental) terms for BI-DAA ‘father’ and MAAN-DAA ‘mother’ experienced lexicalization by a compounding process that realizes the parental term in a holistic form. However, it remains unclear what the other sign is that the person term compounded with to construct *father* or *mother*. One possible deduction what that other sign might have been would be the initialized handshape of ‘A’ used as the orthographic representation of both parental terms that end with an *a*. Both forms of *father* and *mother* show person term phonologically bleached through a reduction in movement and a change in handshape; indicating lexicalization took place. Person terms motivate constructions of parental, spousal, and sibling terms in Thai Sign Language.

Neither gender marking nor semantic derivation of *man* and *woman* appears in ascending kin terms except for parental terms. Grandparental terms specify by kin relationship to Ego based on either paternal or maternal lineage as detailed in Appendix G7 Table G35.

Table G35

Constructions of grandparental terms in Thai Sign Language

Kin Term	Semantics Encoded	1 st Lexical Unit	2 nd Lexical Unit
BPòO	<i>father's father</i>	[old]	‘P-1’+stative-movement
YâA	<i>father's mother</i>	[old]	Y+circular-movement
	<i>father's mother</i>	T+circular-movement	
DTAA	<i>mother's father</i>	pointing under ipsilateral eye	T+stative-movement
YAAI	<i>mother's mother</i>	Y+vertical-bidirectional-straight-movement	

All grandparental terms express in neutral space. Paternal grandparental terms construct from two overt lexical units of a sign *old* preceding an initialized handshape of ‘P-1’ or ‘Y’.¹¹⁵ As there are two lexical variants of *father’s mother*, another variant of *father’s mother* holistically realizes as one lexical unit of a circular movement overlapped with an initialized handshape of ‘T’. The term for *maternal grandfather* constructs from two forms by pointing under the ipsilateral eye and an initialized handshape of ‘T’. However, maternal grandmother conveys in one holistic form of an initialized handshape of ‘Y’ with a bidirectional vertical movement. The comparison between initialization forms of ‘Y’ seen in *paternal grandmother* and *maternal grandmother* reveals they are expressed differently in types of movement that might be accounted for by two factors. First, it may be due to orthographic representation of tonal forms, or type of movement that differs between paternal grandparents (circular) and maternal grandparents (straight). Grandparental terms reveal that Thai differentiates between paternal and maternal lineage to specify kin relation to Ego.

Thai Sign Language differentiates first ascending collateral terms by a reference to age with respect to either mother or father of Ego. The kin relations of *nephew*, *niece*, and *grandchild* are referred to by one kin term. These collateral terms are described in Appendix G7 Table G36.

¹¹⁵ The handshape of ‘P-1’ represents the first tone of /p/ as spoken Thai is a tonal language as described in the Thai Sign Language dictionary.

Table G36

Collateral kin terms in Thai Sign Language

Kin Term		Specified Kin Relation	Phonological Structure Situating in Neutral Space
BPAA	'aunt'	maternal or paternal elder sister	'P-1'+stative
NAA	'aunt or uncle'	maternal younger sister or brother	N+circular
AA	'aunt or uncle'	father's younger sister or brother	A+circular
LOONG	'uncle'	uncle	L+circular
LAAN	'nephew, niece, grandchild'	nephew, niece, grandchild	H+circular
YAAT	'relatives'	relatives	Y+circular

The ascending and descending kin terms for BPAA 'maternal or paternal elder sister', AA 'younger paternal aunt or uncle', NAA 'younger maternal aunt or brother', LOONG 'uncle', and LAAN 'nephew, niece, grandchild' are realized with a circular movement in neutral space except for BPAA 'maternal or paternal elder aunt' as it is conveyed by an internal change from an initialized handshape of 'P' to an index finger as a holistic form. These collateral kin terms overlap with an initialized handshape of 'A', 'L', 'P-1', 'N' according to Thai's alphabet; indicating that this set of terms is a marked category.¹¹⁶ The term for YAA 'relatives' also overlaps with an initialized handshape of 'Y' moving in a circle; illustrating the paradigm of collateral terms constructed of both

¹¹⁶ The Thai Sign Language dictionary describes the handshape of 'P-1' represented as the first tone of /p/ while an 'A' conveys a vowel base of /a/ as spoken Thai is a tonal language.

initialized handshape and a circular movement. These kin terms do not share the same semantic domain as person and parental terms in Thai Sign Language.

There are some Thai kin terms that do not contain signs of *man* or *woman* or overlap with initialized handshape. There are two collateral kin terms that collectively refer to *brothers and sisters*. Both collective co-lineal kin terms are realized in two different phonological structures. One sign contains a non-dominant hand with all extended fingers situated in neutral space, while the dominant handshape of a closed fist extends the thumb and moves in an arc above of the thumb of the non-dominant hand. During the arc movement, the dominant handshape changes from a closed fist to open hand ending approximately at the end of the pinky finger of the non-dominant hand. The other sign referring to *brothers and sisters* realizes using one flat hand moving in an arc, starting in upper neutral space and ends in a lower neutral space; depicting all siblings grouped together ranged in age from oldest to youngest. Also, the term for *family* does not overlap with any person terms or initialized handshape and similar phonological forms of grandparental and collateral terms, but instead maps to a metaphorical domain of a circular form enclosing familial members into a group. These collective kin terms are not derived from person terms, suggesting that other conceptual domains motivate these terms.

Kinship terminology in Thai Sign Language illustrates person terms that motivate parental, spousal, and sibling terms. Phonological overlap of an initialized handshape influenced by orthographic forms of Thai kin terms robustly produces grandparental and

first ascending collateral kin relations discriminated by paternal and maternal lineage in Thai kinship lexicon.

APPENDIX G8: DESCRIPTION OF MIDDLE EAST LANGUAGES KIN TERMS

Israeli Sign Language

Israeli Sign Language reveals different morphological processes in constructing its 12 identified kin terms.¹¹⁷ Person terms motivate *father*, *daughter*, *sister*, *aunt*, *uncle*, but not *mother*, *brother*, *grandparent*, and *relatives* as they are mapped to different semantic domains. Reduplication of *grandchild* motivates the term of *great-grandchild*, and both terms overlap with an initialized handshape.

Person term of ISHA ‘woman’ maps on the iconic description of a woman’s earring; expressing with closed thumb and index finger located on the ipsilateral ear. As there are two lexical variants of *man*, the first form of *man/male* realizes with a closed flat hand on the forehead. As the hand is statively situated, it contains internal movement of the hand opening and closing twice. The form ZACHAR ‘man/male’ appears to map to a cultural framework of a *man’s hat*. The second form glossed either as ISH or BA’AL ‘man/husband’; conveying a curved index finger and thumb moving straight down in neutral space. Comparing both forms of male person terms, it appears that both forms as two different phonological forms probably denote different semantic functions in signed Israeli discourse.

The paternal term is semantically derived from the male person term; overlapping location to mark masculine. The form of *father* expresses with an index finger, moving in an arc from the forehead to the chin. The female person term does not motivate the

¹¹⁷ I thank Dan Parvaz and Ido Roll for their assistance with Hebrew translations.

construction of the maternal term as there is no phonological overlap between female person term and *mother*. The form, *mother*, conveys with an index finger moving in an arc from the contralateral to ipsilateral side of the chin. The term of *parents* compounds both forms of *father* and *mother* into one holistic form. Interestingly, parental terms overlap in phonological structure except for location; suggesting that location, as a contrastive phonological feature, may function as an emergent grammaticalization of gender marking.

Person term of *woman* motivates female kin terms of *sister*, *daughter*, and *aunt* in constructions of two lexical units. Within the male set, *uncle* is the only construction with male person term and another overt sign, but not *brother*. In Appendix G8 Table G37, patterns reveal how kin terms are produced with person terms in the second position in all constructions as follows:

Table G37

Kin terms constructed with person terms in Israeli Sign Language

Female Kin Terms		1 st Lexical Unit	Person Term	Male Kin Terms		1 st Lexical Unit	Person Term
ACHOT	'sister'	<i>same</i>	<i>woman</i>	ACH	'brother'	distinct form	
BAT	'daughter'	<i>birth</i>	<i>woman</i>				
DODA	'aunt'	<i>(unknown translation)</i>	<i>woman</i>	DOD	'uncle'	<i>(unknown translation)</i>	<i>man</i>

Three female kin terms of *daughter*, *sister*, and *aunt* are sequentially realized with a female person term following a lexical unit (E.g. *birth*). In contrast, the kin term of *uncle* is the only term that sequentially constructs with male person term following an

overt lexeme. The term of *brother* is distinctly formed by one sign compared to the term, *sister*, constructed of two lexical units; indicating asymmetry where sister is more marked than brother. The form of *brother* expresses with index and middle fingers internally wriggling located in neutral space, while the term *sister* realizes two-manual index fingers, tapping each other in neutral space. There is no lexical entry of son reported in Israeli Sign Language dictionary; therefore, a comparison between both forms of son and daughter cannot be conducted at this point.

Within the set of second and third descending lineal kin terms, the term *great-grandchild* forms with bent index and middle fingers, moving away from the signer with an arc movement. The construction of *great-grandchild* is formed by reduplication, repeating the term of *grandchild* twice. Regarding the handshape manifested in both kin terms, it appears that the function of the bent index and middle fingers represents an initialized handshape of 'N'.

Two kin terms, *grandparent* and *relatives*, do not overlap similar morphological processes observed in other kin terms. The form of *grandparent* realizes with a fist tapping on the chin; illustrating no distinction in gender. The term of KORVIM 'relatives' shows no phonological overlap with any other kin terms, expressing with dominant index and middle fingers moving straight to the stative non-dominant index and middle fingers situated in neutral space. These terms map on conceptual domains other than those observed in the remaining set of Israeli kin terms.

Israeli Sign Language constructs person terms based on iconic features specified by their cultural framework. Two kin terms of *grandchild* and *great-grandchild* suggest

an overlap with an initialized handshape. Patterns reveal several morphological processes including initialization, reduplication, and gender marking in constructing Israeli kinship terminology.

Persian Sign Language

Based on a small set of eight kin terms reported in Persian Sign Language, kin terms are not motivated by person terms, but instead are iconically motivated. A few kin terms appear to be constructed through a lexicalization process of the term, *family*.

The basis of person term forms includes iconic properties motivated by an Iranian culture-specific framework. The male person term expresses using an index finger moving on the upper lip, indicating a mustache. The term for *boy* expresses with a full handshape of 'B' with the radial side situated on the forehead with no movement. The person term for *female, lady, madam* depicts the form of a headscarf worn by Iranian women, realizing with two index fingers ipsilaterally moving down from the forehead to the chin.¹¹⁸ Appearing to be lexicalized from the female person term, the form *girl* conveys with one hand opening and closing twice located on the ipsilateral side of the face.

While person terms are motivated according to cultural-specific iconicity attributed to Iran, kin terms also construct using iconic features, but map to different conceptual frameworks. The paternal term depicts the form of a beard hanging below the chin with a claw handshape. The maternal term conveys with a closed fist of an 'A' handshape moving from the contralateral breast to the ipsilateral breast. The maternal form maps on the iconic representation of breasts, denoting *mother*. The second

¹¹⁸ In Farsi, the headdress worn by women is called *roosari* or commonly known as a *hijab* in Islamic countries.

ascending kin terms of *grandfather* and *grandmother* extend on the parental terms with another lexical unit of a claw handshape; moving straight twice in upper ipsilateral space off the face. Although there are two components in the constructions of grandparental terms, the illustrations do not describe the order of these components, leading to an unclear description of the ordering of the components in the construction. The pattern shows that the first and second ascending kin terms construct on cultural-specific iconic properties.

The form of *family* is realized in two constructions. The first form expresses using two index fingers alternatively crossing each other situated in the neutral space. Along with the first form, the second construction produces using two ‘C’ shaped hands moving toward the center in neutral space. Again, the dictionary does not describe the ordering of these components. Interestingly, the collateral forms of *brother* and *sister* derive from the term, *family*. The form, *brother*, produces using curved index fingers, crossing fingers situated in the neutral space. The form of *brother* overlaps in phonological structure with the form *family*, except for the joint description of the index finger (*brother*: bent; *family*: straight). Similar to *brother*, the form of *sister* constructs with pinky fingers crossed together. Comparing both collateral forms, they are discriminated based on gender; however, the pattern is limited to these two kin terms and cannot be determined if index finger functions as masculine marking while the pinky finger marks feminine.

Persian Sign Language constructs person and kin terms based on iconic features specified by their cultural framework. There is no evidence illustrating initialized handshapes in this kinship terminology.

Turkish Sign Language

Turkish Sign Language (Türk İşaret Dili, TİD) reports 25 kin terms motivated by a range of semantic properties. Turkish kin terms differentiate familial relations by paternal and maternal lineage. While both sibling and offspring terms contain gender marking, sibling terms also mark age for *elder brother* and *elder sister*. Most kin terms are expressed as distinct forms; indicating these forms map to semantic domains other than person terms to discriminate kin relations in different sets of kin terms.

As there are two lexical variations of *man*, the first variant conveys a metonymic schema of a man's beard; realized using an extended thumb tapping twice on the chin. Another variant of *man*, glossed as ERKEK, maps to the iconic description of a mustache. Person term of *woman* expresses with extended index and middle fingers; tapping twice on the chin. The paternal term of *father* is similar to the form of the first variant, *man*, while the maternal term *mother* illustrates no phonological overlap with the person term, *woman*. The form of *mother* conveys an iconic description of female breasts. While parental terms exploit iconicity, female person term is constructed by a different semantic domain as it does not appear to be motivated by iconicity. The motivation of Turkish marking masculine appears in *man* with an extended thumb, while terms marking feminine appear in *woman* with extended index and middle fingers.

The interaction of handshape and movement is seen in Turkish kin terms of *elder brother* and *elder sister*. Overlapping phonological structures reveal two shared semantic properties indicating gender and age of referent. Gender marking is semantically derived from person terms of *woman* and *man*; differing in handshape to discriminate between

the genders of elder sibling. Both location and movement (which is a phonological property of co-articulation) denote the similar semantic property of age of referent.

Person terms motivate sibling and offspring kin terms as person terms encode the semantic property of gender. Gender marking emerges in these kin terms by a range of the degree of phonological reduction of person term as follows in Appendix G8 Table G38:

Table G38

Constructions of kin terms in Turkish Sign Language

Turkish		1 Lexical Unit	2 Lexical Units	
AğABEY	'elder brother'	[<i>male + age-of-referent: elder</i>]		
ALBA	'elder sister'	[<i>female + age-of-referent: elder</i>]		
KARDES	'sibling'	[<i>sibling</i>]		
ERKEK KARDES	'brother'		[<i>male</i>]	[<i>sibling</i>]
KIZ KARDES	'sister'		[<i>female</i>]	[<i>sibling</i>]
OğUL	'son'		[<i>male</i>]	[<i>child</i>]
KIZ	'daughter'		[<i>female</i>]	[<i>child</i>]

The phonological structure of person term constructed into kin terms reveals degrees of grammaticalization. Within the set of sibling terms, elder sibling terms reveal an intersection of gender marked by handshape and age-of-referent marked by an arc moving up. The most reduced phonological property of person terms is observed in terms of *elder brother* and *elder sister*; intersecting with a semantic property of age of referent; indicating more grammaticalized constructions. As for non-elder sibling terms, these kin terms may either express *sibling* as a free-standing form or sequentially construct with

two overt signs of [person term] [*sibling*]; indicating this is a marked category compared to elder sibling terms.

The offspring terms produce with another semantic domain expressing *child* in a sequence of two lexical units. As for terms of *daughter* and *son*, these forms construct with two signs. However, the phonological structure of person term is reduced from two movements to one movement—suggesting these forms have undergone lexicalization. Comparing both sibling and offspring terms, evidence shows varying degrees of phonological quality in person terms that suggests an emergent grammatical function of gender marking in Turkish Sign Language.

Comparing forms of KARDES ‘sibling’ and KUZEN ‘cousin’, there are two possible accounts of how these terms are related. The first possible explanation is that these terms overlap in all phonological features except for handshape and palm orientation. Both forms realize with selected fingers tapping each other in neutral space; differentiated by handshape of extended pinky fingers for KARDES ‘sibling’ and extended index and middle fingers for KUZEN ‘cousin’. The handshape of KUZEN ‘cousin’ is motivated by an initialized handshape of ‘K’, indicating markedness compared to the form of *sibling*.¹¹⁹ While KUZEN ‘cousin’ orientates palm down, the palm

¹¹⁹ TID has a two-manual alphabetic system, which appears to be constructed by transparent representations of orthographic Turkish alphabet. For instance, the form of ‘Ü’ realizes with non-dominant bent index finger and thumb while the dominant hand of a closed index finger and thumb makes two dots over the non-dominant index finger and thumb. By comparison, TID alphabetic system differs from the two-manual alphabetic system of British, Australian, and New Zealand Sign Language.

orientation realized in KARDES ‘sibling’ faces toward the signer. The phonological overlap in both forms indicates these terms are driven by the conceptualization of *same*.

However, the second explanation draws from the examination of the term, KUZEN ‘cousin’, by proposing that the form itself is an alphabetic representation of a ‘K’ and expresses no semantic overlap with KARDES ‘sibling’. The argument lies in the examination that the manifestation of a ‘K’ coincides with the form of *sibling* as the alphabetic form of ‘K’ locates in neutral, tapping twice on the selected fingers. The accounts of how terms of *sibling* and *cousin* are related or unrelated draw from either arguments of semantic overlap or coincidence.

Unlike sibling and offspring terms where a person term produces these constructions, kin terms of ÜVEY BABA ‘stepfather’, ÜVEY ANNE ‘stepmother’, and ÜVEY ÇOCUK ‘stepchild’ retain the full phonological structure of terms of *father*, *mother*, and *child* within the construction of either two or three lexemes; illustrating these kin terms as more marked than the other two sets of kin terms. The form of ÜVEY ‘step’ appears to be lexicalized from the term ES ‘spouse’ as they overlap in phonological structure and semantic domain.¹²⁰ As for the term of AILE ‘family’, it maps to a domain

¹²⁰ The term of ES ‘spouse’ maps to the semantic property of *marry* and is gender neutral. The dominant thumb in the form of *spouse* contacts the non-dominant thumb with several short movements, while the dominant thumb of ÜVEY ‘step’ moves with one arc movement from ipsilateral shoulder to the non-dominant thumb. The change in co-articulated movement and location suggests a close semantic relationship between both terms, and lexicalization occurred to construct ÜVEY ‘step’ from ES ‘spouse’.

illustrating a metaphorical schema of an enclosed container consisting of a unified group of familial members.

Turkish Sign Language specifies kin relations based on paternal and maternal lineage as observed in second ascending lineal, first ascending collateral, and affinal kin terms. Second ascending lineal kin terms are differentiated by parental lineage. The form of ANNEANNE ‘maternal grandmother’ realizes with a full bent hand tapping three times on ipsilateral cheek. The term of BABAANNE ‘paternal grandmother’, conveys a similar form of ANNEANNE ‘maternal grandmother’, but instead expresses using bent index and middle fingers situated below the ipsilateral eye. Interestingly, both terms are distinct forms from spoken/written Turkish; demonstrating no influence by possible compounds of both forms of *father* and *mother* to specify the relation of the Ego to either maternal or paternal grandmother. There are no lexical entries for *maternal grandfather* and *paternal grandfather* to examine if all four terms of *maternal grandmother*, *paternal grandmother*, *maternal grandfather*, and *paternal grandfather* show any intersections of semantic properties such as lineage.

A set of terms referring to male collateral kin including: *maternal uncle*, *paternal uncle*, and *aunt’s husband/sister’s husband* overlap in phonological structure. First, these three forms realize using an index finger, indicating a possible overlap in some kind of semantic property. Both forms of *paternal uncle* and *maternal uncle* resemble very similar handshape and arc movement except for differences in palm orientation and internal movement such as co-articulated phonological features. While both forms move with an arc movement from the chin to neutral space, *maternal uncle* orientates its palm

facing away from the signer with no internal movement. In contrast, the palm orientation of *paternal uncle* faces contralaterally, then during the arc movement, the wrist twists, changing the palm orientation to up as it reaches neutral space. Co-articulation of palm orientation and internal movement specify the consanguineal uncle affiliated to one of the Ego's parents.

The type of handshape and movement also manifests in the term ENISTE 'uncle/brother-in-law', specifying either *aunt's husband* or *sister's husband*. However, its form does not overlap in location as it situates under the eyes, moving in an arc from ipsilateral to contralateral side. Comparing *aunt's husband/sister's husband* with *paternal uncle* and *maternal uncle*, the term of *aunt's husband/sister's husband* shows less phonological overlap than in both terms of *maternal uncle* and *paternal uncle* by differentiation of location. The degree of phonological overlap reveals type of kin relation; reflecting ENISTE as a non-consanguineal kin relation as opposed to consanguineal members seen in *maternal uncle* and *paternal uncle*. Although these three kin terms share a semantic representation as a male kin member, the paradigm shows asymmetry in phonological structures differentiating among kin relations of *maternal uncle*, *paternal uncle*, and *aunt's husband/sister's husband*.

Unlike phonological overlap observed in the terms of *maternal uncle* and *paternal uncle* marked by an identical phonological form except for the difference in palm orientation, the female counterpart conveys terms as distinct forms. The form of *maternal aunt* expresses with stacked index and middle fingers circling up four times on the chin. The form of *paternal aunt* realizes with a spread hand statically centered on the chest

while the head and shoulders sway sideways. As both forms of *maternal aunt* and *paternal aunt* do not contain any phonological overlap, reflecting distinct forms motivated by different domains. However, one could suggest that *maternal aunt* could map to a similar semantic domain as the terms of *maternal uncle* and *paternal uncle*, because *maternal aunt* overlaps in location on the chin similar to the initial position in both consanguineal uncle terms. There is no lexical entry of *uncle's wife* or *brother's wife* similar to ENISTE 'aunt's husband or sister's husband', which would be helpful to discriminate among the constructions of ascending collateral kin terms along with affinal terms of *sister-in-law* and *brother-in-law*. Comparing both female and male consanguineal collateral terms, Turkish mark *maternal uncle* and *paternal uncle* by handshape and location but handshape appears to mark male collateral and affinal terms (within a set of three terms including ENISTE 'aunt's husband or sister's husband'). As for female consanguineal collateral terms, two forms are distinct in phonological structure; indicating no marking to specify female collateral terms.

Distinct forms of female collateral and affinal terms suggest these terms map to different domains, which their linguistic behavior departs from patterns observed in the male counterpart. This finding is affirmed by an affinal term of KAYNANA 'mother-in-law' which also realizes a distinct form using an index finger wrapped on the thumb with several wrist twists located in neutral space. Affinal kin terms of GÖRÜMCE 'husband's sister' (sister-in-law) and YENGE 'uncle's wife or brother's wife' (aunt/sister-in-law) express only by using an initialized handshape of 'G' and 'Y' respectively in neutral space. The phonological overlap of initialized handshapes clearly indicates a marked

category for affinal kin relations in Turkish Sign Language and is also seen in the collateral term of KUZEN ‘cousin’. The existence of initialized handshapes demonstrates one type of motivation used in constructing kinship terminology in Turkish Sign Language.

Turkish Sign Language constructs person terms based on iconic features of physiological attributions. Gender remains salient and pervasive in most Turkish kin terms overlapped with other semantic domains, where an extended thumb marks masculine while index and middle fingers marks feminine. Patterns reveal initialized handshapes construct two affinal terms and a collateral term of *cousin*; indicating markedness. As elder sibling terms encode both gender and age in one holistic form, sibling terms construct using person term and *sibling* as two overt lexemes; indicating non-elder sibling terms are more marked than elder sibling terms. Turkish differentiates kin terms based on paternal and maternal lineage; expressed by either a distinct form or a possible morpheme specifying male collateral and affinal kin. Constructions of Turkish kin terms show a variety of motivations among different conceptual domains and linguistic economy by incorporating gender marking, age-of-referent, and initialized handshapes to specify kin relations.

APPENDIX G9: DESCRIPTION OF EUROPEAN SIGNED LANGUAGES KIN

TERMS

Bulgarian Sign Language

Most of the 25 kin terms in Bulgarian Sign Language construct on person terms. Person terms realize in the initial position in all constructions of two or three lexical units, except for the two constructions of *great-grandfather* and *great-grandmother*. Parental terms produce a domain of first, second, and third direct ascending kin terms.

Kin terms of all male relatives except for *father* express sequentially using two or three overt lexemes. Eight out of twelve male kin construct from a person term, *man*, while four male kin express with a paternal term for *father*. While the terms for *man* and *father* are similar in form, they differ by handshape seen in *father* with a full hand of 'B', and *man* with an index finger. The difference in handshape illustrates a phonological change; indicating that *father* is derived from the form of *man*; motivated by an iconic property of *mustache*.

Except for *great-grandfather*, both terms for *man* and *father* are positioned first within the construction of male kin terms. The form of *great-grandfather* contains three lexical units. The term for *father* produces male ascending kin terms and *parents*. The domain of *man* constructs a set of kin terms consisting *husband*, *brother*, *son*, *grandson*, *cousin-masculine*, *maternal uncle/paternal uncle*, *wife's father* (father-in-law); *husband's father* (father-in-law). However, closer observation of the last four kin terms, *cousin-masculine*, *maternal uncle/paternal uncle*, *wife's father* (father-in-law); *husband's father* (father-in-law), reveals a bent index finger, which differs from the first three kin terms

with a straight index finger. All kin terms express using an index finger, either straight or bent, are within the domain of *man*.

Within the given set of female kin terms, two forms lend to the construction of kin terms are *woman* and *mother*. The phonological structure of *mother* reflects the iconic property of the shoulder-length hairstyle of elder females representing the domain of *mother* with a full hand moving from the top of the head to the shoulder. In contrast, the form of *woman* produces using an index finger on the forehead, depicting a more iconic quality for *mother* than the form of *woman*. Both forms, *mother* and *woman*, share the phonological feature of location on the forehead. The relationship between *woman* and *mother* denotes a semantic derivation not as explicitly illustrated as the male domain of *man* and *father*.

Six female kin terms express the person term for *woman* in the initial position of two-lexeme constructions. These female kin terms are *daughter*, *wife*, *cousin-feminine*, *wife's mother* (mother-in-law); *husband's mother* (mother-in-law). The collateral term for *cousin-feminine* expresses, following *woman*, with an index finger that moves horizontally with an arc. This particular form reflects a metaphorical mapping (or conceptual framework how Bulgarians view their kinship system). The forms of SESTRA 'sister', LELYA 'paternal aunt', and VUIJNA 'maternal aunt' share the same construction of [*female*] [*two-fingers-pair*], revealing that Bulgarian Sign Language does not draw distinction between *sister* and *aunt*. Furthermore, in written Bulgarian, the forms for *aunt* and *uncle* discriminate based on paternal and maternal kin relations. In the

case of Bulgarian signs, they do not reflect the distinction between paternal and maternal uncle and aunt, but instead conflate these kin relations together.

Paternal terms contribute to the domain of first, second, and third direct ascending kin terms. The set of direct ascending kin terms illustrates construction that realizes the form of *mother* or *father* in the first position before the second sign for *elder*; *elder person*. The term for *mother* constructs *grandmother* and *great-grandmother*, while *father* is expressed in *grandfather* and *great-grandfather*. The second ascending kin term for *grandmother* realizes sequentially with two lexical units: [*mother*] [*hand-holding*]; also similar to *grandfather* with a paternal term. Compared to second ascending kin terms, the third ascending kin terms for *great-grandmother* and *great-grandfather* construct similarly, but with three lexical units. Extending the construction of the grandparental kin terms, the lexical unit of *above* precedes the construction: [*above*] [*mother/father*] [*holding-hand*]. Also, the form for *parents* is constructed with both parental terms: [*father*] [*mother*] [*birth*]. The pattern shows that parental terms productively construct the domain of direct ascending kin terms.

The form of [*two-fingers-pair*] appears to be motivated by the numeral incorporation of '2' with finger wriggling in the selected index and middle fingers. The form of [*two-fingers-pair*] produces kin terms for *brother*, *sister*, *uncle*, *aunt*, and *relatives*, representing the concept of (pairness and/or duality). It remains unclear if the form itself is a free-standing morpheme or bound morpheme in other domains. However, within this set, the form reduces (pair-like) kin terms.

Out of 24 kin terms, the domain of *birth* produces a large set of seven kin terms. For instance, the forms of *son* and *daughter* express with a person term and *birth* in the construction: [*man/woman*] [*birth*]. The second descending kin terms for *grandson* and *granddaughter* extend the construction with a lexical unit of *after* which precedes the first descending kin terms.¹²¹ The remaining kin terms refer to *family*, *relatives*, and *parents*, that all use three-lexical constructions to convey the lexical unit of birth, illustrating the domain of *birth* is extremely productive in constructing Bulgarian kin terms.

Person terms are productive in the construction of Bulgarian kin terms. However, to determine whether person terms function as gender marking requires a more detailed examination of the lexicon in Bulgarian Sign Language. The forms of *father* (and *uncle*) derive from the male person term, sharing similar phonological structures except for handshape. The domain of parental terms extends to the constructions of first, second, and third ascending direct kin terms. Initialized handshapes do not appear to be exploited in the construction of any Bulgarian kin terms.

¹²¹ With respect to the phonological structure, the form of *after* produces with two-manual handshape of ‘B’, while the form observed in *grandson* and *granddaughter* expresses with an index finger in both hands, suggesting an overlapped domain in semantics.

Croatian Sign Language

Based on a small set of 6 kin terms reported in Croatian Sign Language (Hrvatski Znakovni Jezik, HZJ), person terms along with another lexical unit produce four kin terms.

The forms of person terms base on iconic properties motivated by the Croatian cultural-specific framework. The male person term expresses with an index finger and thumb rubbing together on the ipsilateral side of the upper lip; indicating a mustache. The person term for *woman* exploits the iconic description of a woman's earring; expressed with a closed thumb and index finger located on the ipsilateral ear.

Person terms extend to offspring and sibling terms; producing constructions of two lexical units. These kin terms are described in Appendix G9 Table G39.

Table G39

Constructions of offspring and sibling kin terms

Kin term	Translation	1 st Lexical Unit	2 nd Lexical Unit
BRAT	'brother'	<i>sibling</i>	<i>man</i>
SESTRA	'sister'	<i>sibling</i>	<i>woman</i>
SIN	'son'	<i>offspring</i>	<i>man</i>
KCI	'daughter'	<i>woman</i>	<i>offspring</i>

The sibling terms for *brother* and *sister* construct from two lexical units. The second sign expresses a person term for either *male* or *female* following the first sign of *sibling*; constructed as [*sibling*] [person term]. The form *sibling* conveys index and

middle fingers wriggling alternatively as an internal movement while statically situated in neutral space.

Croatian offspring terms contain two lexemes; however the word order differs between *son* and *daughter*. The term for *son* realizes its person term following *offspring*, similar to other sibling terms. In contrast, the term for KCI ‘daughter’ reverses the order so that the person term precedes *offspring*. Croatian kinship terminology discriminates offspring and siblings by gender expressed with a person term in the final position of two-lexemes constructions—except for the construction of *daughter* where person term precedes *offspring*.

Both parental terms demonstrate phonological overlap with person terms; suggesting parental terms are motivated by a different semantic domain other than person terms. Appendix G9 Table G40 describes the phonological structure of these parental terms.

Table G40

Phonological structure realized in parental kin terms

Kin Term	Handshape	Location	Movement
MAMA ‘mother’	full hand ‘B’	forehead→ chin	arc
OTAC ‘father’	full hand ‘B’	ipsilateral chin→ contralateral chin	arc

The form of *father* expresses with a full handshape of ‘B’ moving in an arc from the forehead to chin. As for *mother*, the full hand moves in an arc from the ipsilateral to

contralateral areas of the chin. Both forms overlap in handshape and movement; indicating they map to a similar semantic domain. In contrast, the differentiation of location specifies gender of parents; suggesting location may function as gender marking. However, a much larger set of kin terms will be required to determine if gender marking emerges in Croatian kin terms.

Croatian Sign Language constructs person terms based on iconic features specified by their cultural framework; extending person terms to construct offspring and sibling terms. In contrast, parental terms contain no phonological overlap with person terms; indicating different semantic motivation. Initialized handshapes are not evidenced in Croatian's kinship terminology.

Danish Sign Language

Danish Sign Language (Tegnsprog, TS) reports 32 kin terms along with other 11 lexical variants; totaling 44 identified kin terms. Danish kin terms contain gender and numeral markings. Gender is marked by signs' location; distinguishing feminine on the forehead while the side of the face marks masculine. Numeral marking indicates the degree of separation in generational relationships with respect to Ego referent. There is no evidence that any kin terms are derived from person terms.

Female person term for *woman* locates on the breast area, mapping onto the framework of female's physique while *girl* depicts an iconic form of a hairstyle associated with young girls. Signs for *man* and *boy* are located on the forehead and do not reflect on the masculine physique, but are derived from a different conceptual mapping. The signs for *woman* and *man* also function as *wife* and *husband*. Not only *woman*, the domain of *wife* also includes the sign, *wife* framing on the concept of *marry*.

According to the Danish dictionary, *boy* can function to convey either *boy* or *son* in a construction following the morpheme denoting *person-whose-height-is-short*. However, *girl* does not semantically extend to express *daughter*. Similar in form to first descending kin terms, *son* realizes with one vertical movement while *daughter* with two vertical movements. The motivation of these kin terms constructs on different conceptual frameworks than seen in other Danish kinship terminology.

Ascending kin terms embed both gender and numeral marking; constructions based on written Danish gender and numeral marking in Appendix G9 Table G41.

Table G41

Constructions of Danish ascending lineal kin terms

Numeral Marking	Female Marking Only		Male & Female Marking		Male Marking Only		Female and Male Marking	
1 (index)	MOR	'mother'			FAR	'father'		
2 (index, middle)	MORMOR	'mother's mother'	FARMOR	'father's mother'	FARFAR	'father's father'	MORFAR	'mother's father'
	BEDSTEMOR	'grandmother'			BEDSTEFAR	'grandfather'	BESTEFORÆLDRE	'grandparents'
3 (index, middle, ring)							OLDEFORÆLDRE	'great- grandparents'

First, feminine marking realizes on the forehead while masculine marking exploits the side of the face. This pattern clearly illustrates that gender marking is not derived from person terms where the forehead expresses both male person terms and female kin terms.

Second, handshape of selected fingers marks the degree of separation denoting generational kinship, defined by numeral marking. Numeral marking produces Danish ascending direct lineal kin terms, and functions as a numeral incorporation of an external form. Depending on the lexical construction, the numeral form may be either a bound or unbound morpheme (Liddell 2003, Liddell 1996). The incorporation of numeral and gender marking defines specific kin relationships to Ego referent.

Third, constructions of second ascending kin terms reveal an influence by morphological properties shown in written Danish; overlapping structural mapping of written Danish to signed Danish terms. MORMOR ‘the mother of the Ego’s mother’ expresses with two movements on the forehead with a handshape of ‘2’; illustrating reduplication of *mother* to construct *mother’s mother* similar to written Danish. The pattern of reduplication is also seen in FARFAR ‘the father of the Ego’s father’ with two movements on the side of the face with a handshape of ‘2’; expressing as *father’s father*. Written Danish grandparental terms motivate reduplication.

In contrast, reduplication is not exploited to construct *mother’s father* and *father’s mother*. MORFAR ‘the father of the ego’s mother’ realizes its form with a numeral marking of ‘2’, one movement on the forehead (*mother*), then another movement on the side of the face (*father*). In reverse to MORFAR, the form of FARMOR ‘the mother of

the ego's father' moves once on the side of the face, then once on the forehead with a '2' handshape. Danish Sign Language specifies the kin relation in grandparental terms by adopting morphological properties manifested in written Danish.

In contrast, two kin terms for BEDSTEMOR 'grandmother' and BEDSTEFAR 'grandfather' express in a holistic form with a curved '2' handshape, moving once either on the forehead or the side of the face. Ascending direct lineal kin embed both numeral and gender markings, but the set of second ascending kin terms also construct in accordance with the order of written Danish morphological structures.

In contrast to Danish ascending kin terms containing gender and numeral markings, the remaining set of Danish kin terms map to different semantic domains. A co-lineal kin term for *sibling* locates on the ipsilateral clavicle by two taps of a spread full hand of '5'; forming distinctly from other Danish kin terms. Affinal kin terms realize in neutral space; producing two lexical variants of *in-law* and one lexical item for *in-laws*. These affinal terms map to other conceptual domains.

Consanguineal and affinal relations discriminate in Danish collateral kin terms. DTS expresses three different terms for *aunt* based on consanguineal and affinal kin relations. Danish forms the consanguineal terms for *aunt* by the kin relation of *mother's sister* and *father's sister*. These two terms' forms are distinct as *mother's sister* uses a closed fist tapping twice on the ipsilateral jaw, while *father's sister* realizes through fingerspelling based on the Danish's hand-mouth system (possibly better described as phonemic manual alphabetic system). If a woman is married to a consanguineal uncle in the family, then the affinal relation is denoted in the construction of *uncle's wife*. The

affinal term, *uncle's wife*, does not discriminate by parental lineage; produced using an initialized handshape of 'T' either on the contralateral clavicle or in neutral space.

The term, ONKEL 'uncle' may be used to refer either to consanguineal relations of *mother's brother* or *father's brother* or affinal relation (personal communication, Janne Boye Nimelä). There are two terms that refers to the kin relation of consanguineal uncle: *mother's brother* and *father's brother*. Both terms are constructed with two lexemes: [*mother*] [*sibling*] with Danish mouthing of *morbror*; [*father*] [*sibling*] with Danish mouthing of *farbror*. Compared with the use of *uncle*, the kin terms for *sister's brother* and *father's brother* seems to be used less frequently in Danish discourse (personal communication, Janne Boye Nimelä).

The forms of ONKEL 'uncle', TANTE 'aunt', and FÆTTER 'cousin-masculine' and KUSINE 'cousin-feminine' are realized on the ipsilateral shoulder, which does not share the same semantic domain as Danish's person and ascending kin terms. Other lexical variants are expressed in neutral space except for *aunt*. FÆTTER 'cousin-masculine' has a different handshape other than 'F'. They all overlap with an initialized handshape of 'O', 'T', 'F', and 'K' according to Danish's alphabet; indicating this set of terms is a marked category. No gender marking, numeral marking, or semantic derivation of person terms appears in collateral and non-nuclear kin terms in Danish Sign Language.

Danish Sign Language used two different types to manually represent orthographic Danish forms. The first type uses a one-handed manual alphabet to represent orthographic Danish forms; e.g. an initialized handshape of 'T' for TANTE 'aunt'. The second type of a fingerspelling system functions to represent phonemic forms

of consonants according to the orthographic Danish form; i.e.: the positions of vowels expressed with the default form of a closed fist. For instance, NIECE 'niece' produces two phonemic consonants of N and C. After selecting the fingers, the hand closes into a fist, moving downward. This type of fingerspelling produces collateral and affinal kin terms of NIECE 'niece' and NEVØ 'nephew', SVOGER 'in-law', and FASTER 'father's sister'. Comparing both types of fingerspelling, function differs in the manual representations influenced by Danish orthography. Both manual phonemic representation (fingerspelling) and initialized handshape indicates a marked category of Danish collateral kin terms.

Danish Sign Language does not exploit person terms to construct kin terms; as a result, feminine and masculine markings construct on different domains. Danish Sign Language marks gender and number in ascending lineal kin terms. Both initialized handshapes and phonemic fingerspelling function to discriminate non-nuclear kin terms.

Dutch Sign Language

Kinship terminology in Dutch Sign Language (Nederlandse Gebarentaal, NGT) is constructed in several different ways evidenced by 21 identified kin terms along with other 11 lexical variants.

The kin term for *father* displays a relationship between phonological structures overlapping person term with kin term, thus revealing constructions linking the semantic derivation of person term to kin term. Person terms for *man* and *boy* overlap in phonological form. Both male person terms situate on the forehead with a bent full hand closing into a closed flat hand in the final position. However, the movement differs where *man* moves sagittally from the forehead to the neutral space. The form for *boy* is statively located on the forehead with two internal movements of opening and closing the hand.

The person term for *man* motivates the form for *father*. The paternal term for *father* derives from the domain of person terms for *man*; overlapping the location on the forehead. As the initial position locates on the forehead, the final position of *father* ends on the chin area with a bent index finger. Description of Dutch male person terms reveals that *father* overlaps at the same location as *man*, suggesting semantic derivation took place.

Two other variants of *father* exist. The second variant overlaps with a straight index finger moving straight down from the ipsilateral side of the cheek to the chin. The third variant realizes with a straight index finger tapping on the chin referring to *papa*; suggesting this variant may be used in different semantic-pragmatic uses in NGT

discourse. These two variants do not overlap with the person term for *man*; indicating mapping to a different conceptual domain.

Although the form of *woman* does not contact the ear but instead realizes in near proximity of the ear, the term for *woman* maps to an iconic description of a woman's earring. The form *woman* also semantically represents *sister*. The term *girl* maps to the iconic property of *long hair* attributed to young girls. In contrast, the form for *mother* does not derive from the person term for *woman*; indicating no semantic derivation took place. The form for *mother* realizes with a bent index finger moving straight from ipsilateral to contralateral points on the chin.

NGT contains two lexical variants of *grandmother* and *grandfather*. The first variant of grandparental terms is motivated by parental terms. The term for *grandmother* realizes on the chin; overlapping with the semantic domain of *mother*. The handshape of *grandmother* differs from *mother* with a curved index finger and extended thumb, statically expressed with an internal movement of several wrist twists. The term for *grandfather* phonologically overlaps with the form for *father* including a co-articulation of an arc movement from the forehead to the chin, however they are differentiated by handshape. The handshape in *grandfather* overlaps with *grandmother*; marking second ascending lineal terms.

The second variant of grandparental terms constructs from phonemic representations of *grandfather* and *grandmother*. While both forms overlap in all phonological features by circling around the mouth then moves in a straight path from the chin to neutral space, but they differ in handshape. The movement co-articulated with

location refers to the phonemic form of ‘O’. The representation of *grandfather* expresses uses an index finger to denote the phonemic form of ‘P’ while *grandmother* conveys with a full bent hand that refers to a phonemic form of ‘M’. Although the NGT dictionary did not describe the semantic-pragmatic use to discriminate between two sets of grandparental terms, it appears that these forms may be stylistic and/or possibly have different semantic-pragmatic uses in NGT discourse.

In contrast, offspring terms are not motivated by either person or parental terms. The production of offspring terms for *daughter* and *son* realize distinctly. As for both offspring terms, the handshape of a full hand locates centrally on the chest and moves sagittally straight to neutral space, then comes to rest in the final position by closing the hand into a flat closed hand. Both offspring overlap in all phonological structures except that the form of *daughter* reduplicates the term for *son* twice; mapping to a different semantic domain than person and parental terms in NGT.

Sibling and collateral kin terms reveal overlap in phonological form; indicating a shared domain. These kin terms are described in Appendix G9 Table G42.

Table G42

Patterns of sibling and collateral kin terms in Dutch Sign Language

Kin Term	Handshape	Initial Location	Final Location	Movement
BROER <i>brother</i>	spread index and middle: ‘V’	neutral space	clavicle	Several straight taps
ZUS <i>sister</i>	bent index and thumb	neutral space; near ipsilateral ear	neutral space; near ipsilateral ear	Stative; open→closed internal movement of index and

				thumb
NEEF <i>nephew,</i> <i>cousin</i>	spread index and middle: 'V'	clavicle	neutral space	1 straight movement
NICHT <i>niece,</i> <i>cousin</i>	spread index and middle: 'V'	neutral space	clavicle	1 straight movement

Kin terms for *brother*, *nephew/cousin-masculine*, and *niece/cousin-feminine* all share the same phonological form overlapped with handshape and location except for types of path movement. The handshape of spread extended index and middle fingers of 'V' and clavicle location motivate these kin terms; illustrating a shared semantic domain dissimilar to phonological forms of Dutch person or any other kin terms.¹²²

Ascending collateral terms for *uncle* and *aunt* realize in distinct holistic forms. The form for *uncle* conveys a slight bent hand moving from the forehead to the back of the head. The form for *aunt* realizes with a circular movement in proximity of ipsilateral ear; overlapped with an initialized handshape of 'T' representative of the orthographic Dutch form of *tante* 'aunt'. The term for *aunt* derives from the form for *woman*; denoting the semantic property of *female* observed in *woman*, *aunt*, and *sister*.

NGT includes affinal terms for *mother-in-law*, *father-in-law*, *daughter-in-law*, *son-in-law*, and *sister-in-law*. These affinal terms are described in Appendix G9 Table G43.

¹²² An alternative account for the handshape of 'V' may be an initialized handshape of 'N' to represent for both collateral terms for NEEF and NICHT as the handshape of 'N' somewhat resembles to 'V'.

Table G43

Description of affinal kin terms in Dutch Sign Language

Kin Term	1 st Lexical Unit	2 nd Lexical Unit
SCHOONMOEDER 'daughter-in-law'	TROUWEN <i>marry</i>	MOEDER <i>mother</i>
SCHOONVADER 'father-in-law'	TROUWEN <i>marry</i>	VADER <i>father</i>
SCHOONDOCHTER 'daughter-in-law'	TROUWEN <i>marry</i>	DOCHTER <i>daughter</i>
SCHOONZOOM 'son-in-law'	TROUWEN <i>marry</i>	ZOOM <i>son</i>
SCHOONZUS 'sister-in-law'	TROUWEN <i>marry</i>	ZUS <i>sister</i>

Dutch affinal terms are constructed as: [*marry*] [nuclear kin] where the term for *in-law* precedes the nuclear kin term; specifying kin relation by mouthing *schoon* to denote *in-laws* and also mouthing nuclear kin terms. The form for *marry* is phonologically identical to the spousal form for *husband* and *wife*.¹²³ The form of *marry* maps on a conceptual domain by metonymically depicting the arm to represent married status.

¹²³ The phonological forms of *husband* and *wife* identically overlap with the form of *marry*. The form produces with an arm and fist twisting from far to near ipsilateral side of the signer while mouthing either with *man* 'man' or *vrouw* 'woman' to specify the gender of the spousal term.

Two other Dutch kin terms that do not match similar forms observed in other kin terms are *grandchild* and *family*. The second descending kin term, KLEINKIND ‘grandchild’ forms with two lexical units: [KLEIN ‘grand’] [*person-whose-height-is-short: child*], and the term for *grandchild* does not specify gender. The phonological realization of FAMILIEN ‘family’ constructs from an initialized handshape of ‘F’. The form of *family* maps to a metaphorical schema of a circle, denoting the conceptual domain that kin members are encircled into one unified group.

Dutch Sign Language marks gender in ascending lineal kin terms; motivated by parental terms. NGT construct kin terms by semantic properties as seen in the domain of co-lineal and descending collateral terms and another domain denoting *female* in terms for *woman*, *sister*, and *aunt*. NGT exploits initialized handshapes and phonemic fingerspelling to construct non-nuclear kin terms.

Finnish Sign Language

Finnish Sign Language (Suomalainen viittomakieli, SVK) reports most of 13 kin terms defined are based on either nuclear or non-nuclear kin relations. Most Finnish kin terms contain no references to gender.

Most SVK kin terms express without reference to gender; however, they are constructed of a semantic domain that defines nuclear kin relations. The paternal kin term for ISÄ derives from the domain of person terms for *man* and *boy*, overlapping location on the forehead. However, the final position in the realization of *father* ends on the chin area while the male person terms move away from the forehead to the front of the signer's face. Interestingly, the handshape of *father* and *boy* is similar, but not similar to *man*.

Female person terms for situate on the breast area, depicting the iconic female physique. The maternal kin of *mother* does not appear to share the phonological structure of female person terms; the initial location of *mother* locates on the center of the signer's chest then moves upward to the chin. Although the forms of *mother* and female person terms may not overlap in phonological structure, an alternative explanation takes into consideration that the form may have experienced a historical change of location displacement. For signs realized below the neck, Frishberg (1975) describes a generalization of the body displacement to "become more centralized about the line of bilateral symmetry, and moves up toward the hollow of the throat" (p. 703). To determine if *mother* experienced complex lexical changes requires comparison with the older form of *mother*.

The location of the chin area builds a semantic domain of kin terms, reflecting nuclear kin relations of *mother*, *father*, and *offspring*. Expressed via a path movement, parental terms locate on the chin in the final position, while the position of the offspring term initiates at the chin and moves away. Also, the form of ISOISÄ ‘grandfather’ is situated on the chin, whereas MUMMO ‘grandmother’ exploits the cheek area. While the location of chin defines nuclear kin, a more general description shows the location on the face marks first and second ascending kin terms along with first descending kin terms.

Some Finnish kin terms realize in gender-neutral space. Collateral kin terms for *sister* and *brother* share same phonological form, indicating gender is not discriminated in sibling terms. Also realized in neutral space are: *cousin*, *aunt/uncle*, *grandparent*, and *spouse*. Departing from other kin terms situated in neutral space, the construction of the kin term for *grandparent* depicts an iconic behavior associated with elderly people holding a staff while walking; marked as gender-neutral. The third ascending kin produces two lexical units: [*big*] [*grandparent*]. The spousal kin term maps to a metonymic domain by expressing a wedding ring on the ring finger; referring to both husband and wife by a gender-neutral term. Parental kin terms overlap with person terms while non-nuclear kin produce in neutral space and do not overlap the semantic domain of person terms located on the face.

The handshape of the bent index wrapping over the thumb marks parental kin terms. Sibling terms express using a two-manual sign with curved index finger of ‘X’ (with the thumb wrapped on the closed fist), and this is also observed in *family*. Although

the phonological shape of the handshape is slightly different in parental and sibling terms, the handshape marks the domain of nuclear kin terms.

Kinship terminology in Finnish Sign Language shows the relationship of nuclear kin through handshape, situating non-nuclear kin terms in neutral space, and also does not exploit initialized handshapes in any kin terms.

French Sign Language

Kinship terminology in French Sign Language (Langue des Signes Française, LSF) is constructed in several different ways as illustrated by 18 reported kin terms. First ascending lineal kin (parental) terms appear to be motivated by sharing semantic domains of person terms: *man* and *woman*; located on the side of the cheek and/or mouth. Second ascending lineal (grandparental) kin terms are expressed with a lexicalized combination of two units with a phonological reduction in movement: [parental term + *old*] terms as shown: GRAND-PERE ‘grandfather’: [*father* + *old*], and GRAND-MERE ‘grandmother’: [*mother* + *old*]. The order of sign units does not follow written French’s morphological structure of *grandmere*—its order is reversed.

In contrast to LSF’s ascending kin terms containing gender, the first descending lineal kin, FILS ‘offspring’ does not derive from the same semantic domain as ascending kin terms, but one without gender marking. Moreover, neither gender marking nor semantic derivation of *woman* and *man* appears in collateral and non-nuclear kin terms for FRERE ‘brother’, SOEUR ‘sister’, ONCLE ‘uncle’, TANTE ‘aunt’, and COUSIN/E ‘cousin’. These kin terms are realized in neutral space, which does not share the same semantic domain as LSF’s person and parental terms. They all overlap with an initialized handshape of ‘F’, ‘S’, ‘O’, and ‘T’ according to LSF’s alphabet; indicating that this set of terms is a marked category.

In contrast to French kin terms overlapped with initialized handshapes, the first descending lineal kin, FILS ‘offspring’ does not exploit initialized handshape. The form of *spouse* metonymically depicts a wedding ring on the ring finger. The term FAMILIE

family also does not overlap with an initialized handshape, but maps to a metaphorical schema illustrating kin members enclosed in a circle. These terms clearly do not derive from the same semantic domain as person terms or initialized handshapes; but instead exploit different conceptual domains.

French Sign Language shows parental and grandparental terms motivated by person terms while other semantic domains motivate kin terms. Initialized handshapes robustly produce French kin terms.

German Sign Language

The 28 kin terms reported in German Sign Language (Deutsche Gebärdensprache, DGS) contain gender marking and map to different semantic domains.

The description of DGS person terms reveals that *father* overlap at the same location as *man*, suggesting semantic derivation took place. Otherwise, *man* does not motivate forms for *son* and *boy* as they are expressly distinct.

Some of the six lexical variants of FRAU ‘woman’, DAME ‘lady’ and MÄDCHEN ‘girl’ map onto the framework of the anatomy of female breasts. One lexical variant of FRAU ‘woman’ phonologically overlaps with the form for *mother*, where the index finger moves straight down on the ipsilateral side of the mouth. The existence of six lexical variants of *woman* suggests that these variants may be either dialectal signs and/or construe specific semantic-pragmatic functions (Simon Kollien and Agnes Villwock, personal communication). Except for one lexical variant, the phonological structures of *mother* and *daughter* do not semantically derive from person terms for FRAU ‘woman’, DAME ‘lady’, and MÄDCHEN ‘girl’.

The term for *parents* identically matches the form of *marry*, unlike that observed in many signed languages where the sign of parents is combined with parental terms for *father* and *mother*. The spousal kin term for *husband* and *wife* overlap into a same form. The spousal form maps on a conceptual domain by metonymically depicting the behavior of holding an arm while walking. Although gender is not discriminated in the manual form of the German spousal kin term, a mouthing component functions to differentiate the gender referent while signing. The mouthing component is articulated with /frau/,

/mann/ or /sch/ for a spoken German term for *schatz* ‘intimate partner’. These signs are motivated by cultural-specific iconicity leading to different conceptual frameworks than seen in other German kinship terminology.

German kin terms realized in neutral space illustrate that they are not derived from the same semantic domain as person and first and second ascending (parental and grandparental) kin terms. Three sets of kin terms are described in Appendix G9 Table G44.

Table G44

Patterns in sets of kin terms in German Sign Language

Sets of Kin Terms	1 st Set – Sign for ‘same’	2 nd Set – Sign for Collateral Male Relative	3 rd Set – Sign for Collateral Female Relative
Pattern	Mapped to semantic domain of <i>same</i>	Overlapped with handshape of ‘V’	Overlapped with handshape of ‘F’
Spoken words in set	BRUDEN ‘brother’	ONKEL ‘uncle’	TANTE ‘aunt’
	SCHWEISTER ‘sister’	NEFFE ‘nephew’	NICHTE ‘niece’
	STIEFBRUDEN ‘stepbrother’	COUSIN ‘cousin-masculine’	COUSINE ‘cousin-feminine’
	GESCHWEISTER ‘siblings’	VERWANDTE ‘relatives’	

Each of these sets reveals translations of spoken/written Germans to signed forms are actually conflated into one signed form for each set. The first set contains co-lineal terms for *brother*, *sister*, *stepbrother*, and *siblings*. They all share the same phonological form derived from the semantic property of *same*.

The second set of kin relations: *uncle*, *nephew*, *cousin-masculine*, and *relatives*, expresses the same phonological form with two-handed forms with spread extended index and middle fingers; depicting a V' handshape. Similar to the phonological structure observed in the second set, the third set of kin relations produces using two 'F' handshapes where the thumb and index finger makes a circle while the middle, ring, pinky fingers are extended. These kin terms are *aunt*, *niece*, and *cousin-feminine*. The second and third sets phonologically overlap in location and movement, but not handshape. Handshape marks gender, discriminating male and female collateral kin terms.

Similar to the third set of female kin terms, the handshape with a thumb and index finger making a circle, extending other three fingers and situated in neutral space produces the first descending kin terms of *daughter* and *son*. Although the third set of female kin terms consist of two-manual signs with two movements, signs for *daughter* and *son* realize with one hand using a different type of movement. While the terms for *daughter* and *son* are similar in form, they differ by movement where *son* employs one straight movement, and *daughter* employs two straight movements. The similarity of location and handshape suggest that first descending kin terms do share the same semantic domain as the third set of female kin terms.

Out of 24 kin terms, 6 kin terms express sequentially with two lexical units. These two-lexeme constructions include GROßELTERN 'grandparents', GROßFAMILIE 'extended family', GROßMUTTER 'grandmother', GROßVATER 'grandfather',

STEIFBRUDEN ‘stepbrother’, and STIEFMUTTER ‘stepmother’. These terms are described in Appendix G9 Table G45.

Table G45

Kin terms for two-lexeme constructions in German Sign Language

Kin Term	Translation	1 st Lexical Unit	2 nd Lexical Unit
GROßELTERN	‘grandparents’	<i>person-whose-height-is-tall</i>	<i>parents</i>
GROßFAMILIE	‘extended family’	<i>person-whose-height-is-tall</i>	<i>family</i>
GROßMUTTER	‘grandmother’	<i>person-whose-height-is-tall</i>	<i>father</i>
GROßVATER	‘grandfather’	<i>person-whose-height-is-tall</i>	<i>mother</i>
STEIFBRUDEN	‘stepbrother’	<i>step</i>	<i>brother</i>
STIEFMUTTER	‘stepmother’	<i>step</i>	<i>mother</i>

The second ascending kin terms for GROßVATER ‘grandfather’ and GROßMUTTER ‘grandmother’ realizes two lexemes shown as: [*person-whose-height-is-tall*] [*father*] and [*person-whose-height-is-tall*] [*mother*]. GROß ‘great/tall.’ These terms construct in DGS using metaphorical mapping to indicate the age of referent as *older*. The ordering of lexical units produced in GROßVATER ‘grandfather’ and GROßMUTTER ‘grandmother’ suggests an influence from written German.

Comparing GROßVATER ‘grandfather’ and GROßMUTTER ‘grandmother’ to other two second ascending kin terms, OPA ‘grandpa’ and OMA ‘grandma’, the latter terms are motivated by iconic properties. Expressing OPA ‘grandpa’ depicts the form of a mustache, while OMA ‘grandma’ exploits the form of a hair bun on the top of the signer’s head. Both terms for OPA ‘grandpa’ and OMA ‘grandma’ specify gender of grandparental terms; however, they do not contain overt gender marking.

Although the DGS dictionary does not describe the semantic-pragmatic discrimination between two sets of second ascending terms, OPA ‘grandpa’ and OMA

‘grandma’ expresses an intimate relationship between Ego referent and his grandparents as opposed to the more formal GROßVATER ‘grandfather’ and GROßMUTTER ‘grandmother’; implying a more distant, less intimate relationship (Simon Kollien and Agnes Villwock, personal communication). Another plausible explanation is that these kin terms for OPA ‘grandpa’ and OMA ‘grandma’ function as appellatives similar to spoken English’s *granny* and *grandpappy*.

In contrast, the second descending kin term, *grandchild* produces one holistic form and conveys with a pinky finger moving straight down in neutral space. The term for *grandchild* does not encode gender. Another term that does not map to any other kin terms is FAMILIE ‘family’. The form for *family* exploits an image schema of a circle located in neutral space with a phonological overlap with an initialized handshape of ‘F’ for both hands.

Most DGS kin terms constructed from various domains, but few kin terms derive from person terms due to shared iconic properties. No evidence indicates that any kin terms overlap with initialized handshapes except for one term for *family*.

Irish Sign Language

Irish Sign Language (ISL) kinship terminology scaffolds its construction on signed forms with an initialized handshapes of the first orthographic form (letter) in written English. Fifteen out of 16 Irish kin terms (except for *sister*) robustly produce using an initialized handshape. Irish kinship terminology divides into the categories: first ascending and descending lineal, non-nuclear, spousal, and collateral sibling kin terms.

The first two categories first ascending and descending lineal kin terms: *family*, *daughter*, *son*, *father*, *mother*, and *parents*. These kin terms share a similar phonological structure produced using two-handed initialized handshapes ‘F’, ‘D’, ‘S’, and ‘M’ (drawing from the first letter of the orthographic English form) where one wrist crosses over the other wrist situated in neutral space. Although the phonological structure of these kin terms is similar, two categories can be discriminated by palm orientation. Palms up orientation expresses first descending lineal kin category including the terms for *daughter* and *son*, and this form also constructs *family*. Palms inside toward the signer’s body express the ascending lineal kin category of *father*, *mother*, and *parents*. The phonological feature dimensions of *family* and *father* are identical except for palm orientation, providing evidence supporting palm orientation functions as a phonological parameter in Irish Sign Language. Similar phonological structures demonstrate the function of nuclear kin relations, but palm orientation differentiates the domains of first ascending and first descending kin relations.

Departing from first ascending and descending lineal kin terms, the third category that shares a similar phonological structure concerns non-nuclear kin terms: *aunt*, *cousin*,

uncle, *relatives*, *nephew*, and *niece*. Situated on the chin, an initialized handshape moves straight horizontally from the contralateral to ipsilateral position of the chin. As for the first four kin terms for *aunt*, *cousin*, *uncle*, *relatives*, the initialized handshape is conveyed by the Irish manual handshape of ‘A’, ‘C’, ‘U’, and ‘R’. Discriminating between two kin terms for *nephew* and *niece*, these kin terms change from the initialized handshape of N in the initial (contralateral) position to the initialized handshape of W (N→W for *nephew*) and E (N→E for *niece*) in the final (ipsilateral) position. Comparing the differences in phonological structures of non-nuclear kin terms to first ascending and descending kin terms, non-nuclear kin terms differentiate itself based on the function of kin relations. Irish Sign Language produces nuclear kin terms in neutral space while non-nuclear kin terms are expressed on the chin area. This typological behavior differs from most signed languages that mark nuclear kin on the body and non-nuclear kin terms in neutral space.

A fourth category describes spousal terms for *husband* and *wife*. Mapping on the metonymic domain of *marry*, spousal terms depict an action of a ring being put on their marriage (ring) finger. The dominant handshape is initialized either with an ‘H’ or ‘W’, discriminating based on gender of the spouse. The semantic domain of spousal terms maps onto the metonymic framework of the act of marriage.

A fifth category contains two kin terms, *brother* and *sister* that share neither similar phonological structures nor semantic domains observed in the previous categories of kin terms. Although the form of *brother* is expressed with an initialized handshape of B, the phonological structure does not resemble any other kin relations. The phonological

shape of *sister* is the only kin term that does not overlap with an initialized handshape nor map semantic domains as defined in the previous three categories of ISL. Furthermore, both collateral kin terms for *brother* and *sister* do not illustrate any overlapping phonological structures with person terms. As no overlap of phonological structures is observable in other ISL kin terms and person terms, both collateral kin terms appear to be motivated by other conceptual domains.

Kinship terminology in Irish Sign Language illustrates kin terms that show no evidence of any semantic derivation from person terms. Phonological overlap of an initialized handshape influenced by orthographic forms of English kin terms motivate first ascending, first descending, and non-nuclear kin relations in Irish kinship lexicon. Irish kinship terminology marks nuclear kin in neutral space while non-nuclear kin terms contact on the chin.

Italian Sign Language

According to the 19 kin terms identified in Italian Sign Language (Lingua dei Segni Italiana, LIS), generational relationships are marked by location to distinguish between ascending and descending generation to Ego referent. Located on the lower facial (chin and jaw) area, Italian kin terms for ascending generation consist of *mother*, *father*, *grandparent*, and *uncle/aunt*.

Two gender-neutral descending kin terms contrast by location. The first descending kin term: FIGLIO/A ‘offspring’ does not encode the child’s gender and is realized on signer’s chest. FIGLIO/A ‘offspring’ does not share similar phonological structures with ascending kin terms, but maps onto a different semantic domain of *birth*. The second descending kin term, NIPOTE ‘nephew/niece/grandchild’, is situated in gender-neutral space.

Kin terms in LIS cluster in the lower facial area for the ascending generation. Alternative explanations for motivation may include:

- These kin terms are based on the category of ascending lineal kin AND/OR
- They share semantic domains of person terms, man and woman, which are located on the side of cheek and mouth

Not only descending kin, but also collateral and affinal kin terms are realized in gender-neutral space. Collateral kin terms, *sister*, *brother*, *cousin* are realized in neutral space. Also expressed in neutral space is an affinal kin term for *father-in-law*, *mother-in-law*, *son-in-law*, and *daughter-in-law* that all are realized in the same phonological form.

Ascending kin terms overlap with person terms while descending kin, collateral kin, and affinal kin are produced in neutral space and do not overlap the semantic domain of LIS' person terms located on lower facial area. LIS expresses kinship terms with no reference to gender, but does construct a semantic domain that defines ascending kin relations.

Another relevant category of kin terms includes: COGNATE 'sister-in-law/brother-in-law', CUGINO/A 'cousin', and NIPOTE 'nephew/niece/grandchild'. These terms are expressed with initialized handshapes of 'C' and 'N' according to the LIS alphabet, indicating a marked category. In contrast, two kin terms, NONNO/A 'grandfather/grandmother', SORELLA 'sister', and ZIO/A 'uncle/aunt' appear to be ambivalent as to whether are they realized with an initialized handshape or not. The handshape of NONNO/A 'grandfather/grandmother' is phonologically described with bent index and middle fingers; however, this may also be constructed with an initialized handshape of 'N' according to LIS's alphabet. As for SORELLA 'sister', the form appears to be conveyed with a 'S' handshape, suggesting the possibility of being initialized.

Another similar description that remains unclear is ZIO/A 'uncle/aunt' (one lexical variation). Because the handshape is expressed with bent index, it could be represented as a 'Z' handshape. However, another lexical variation for ZIO/A

‘uncle/aunt’ is not constructed with a ‘Z’ handshape, but with a pinky finger, suggesting the motivation for the pinky finger is derived from other semantic domains.¹²⁴

Another kin term that expresses in neutral space is *spouse*. The semantic domain of the term for *spouse* maps onto the metonymic framework of the act of marriage. The evidence that LIS exploits a metaphorical mapping to construct kin terms is observed in the spousal kin term.

Kinship terminology in Italian Sign Language discriminates ascending kin terms on the lower facial area while other kin terms locate in neutral space, and also exploits initialized handshapes to construct some kin terms.

¹²⁴ One could argue the possibility that the pinky finger could trace the orthography form for ‘Z’, but according to the Italian manual alphabet, the index finger is exploited to express ‘Z’, not the pinky finger.

Norwegian Sign Language

The 23 kin terms reported in Norwegian Sign Language¹²⁵ (Tegnspråk) contain two types of markings: gender and numeral. Gender is marked by the signs' location; distinguishing feminine on the forehead while the side of the face marks masculine. Feminine and masculine markings are not semantically (conceptually) mapped onto Norwegian signs for *woman* and *girl*, which are located on the chest area, while the signs for *man* and *boy* are located on the forehead. Moreover, the signs for *woman* and *man* also function as *wife* and *husband*. Terms for *woman* and *girl* are mapped onto the framework of female's physique while *man* and *boy*, framed in a different conceptual mapping, do not reflect the masculine physique, but something else.

While parental and spousal terms are realized in a different semantic domain than personal terms, offspring terms are the only known terms derived from person terms in lexicalized construction: *daughter* [*girl* + *person-whose-height-is-short*] and *son* [*boy* + *person-whose-height-is-short*]. Except offspring terms, signs are motivated by cultural-specific iconicity leading to different conceptual frameworks than seen in other Norwegian kinship terminology.

Second, numeral marking with respect to generation kinship is expressed through handshape. The handshape of selected fingers as numbers indicates the degree of separation in generations as shown in Appendix G9 Table G46:

¹²⁵ Norwegian Sign Language has several dialects in the country, and this set of NTS kinship lexicon is based on the Bergenese dialect.

Table G46

Descriptions of Norweigan kin terms constructed of numeral marking

Numeral Marking		Kin Terms Overlapped with Gender Marking		Kin Terms with No Gender Marking
1	(index)	<i>mother</i>	<i>father</i>	<i>aunt, uncle, cousin</i>
2	(index, middle)	<i>grandmother</i>	<i>grandfather</i>	<i>second-removed relative</i>
3	(index, middle, ring)	<i>great-grandmother</i>	<i>great-grandfather</i>	<i>third-removed relative</i>
4	(index, middle, ring, pinky)	<i>great-great-grandmother</i>	<i>great-great-grandfather</i>	<i>fourth-removed relative</i>

Numeral marking refers to the function of an incorporation of an external form of a number, and may be either bound or unbound morpheme depending on the lexical construction of the sign (Liddell 2003, Liddell 1996). Numeral marking is very productive in Norwegian kin terms, and the overlapped markings of numeral and gender construct explicit kin relationships to ego referent. Ascending direct lineal kin embeds both numeral and gender markings, but kin terms that show degrees of separation in generations are marked only by numeral and not by gender.

The remaining Norwegian kin terms do not display either numeral or gender marking. While there are two lexical variants of *mother* and *father*, one variant does not overlap with either gender or numeral marking. The form for *mother* conveys using an index finger pointed at the ipsilateral side of the nose while *father* moves its index finger from contralateral to ipsilateral side of the chin. Collateral kin terms: *sister* and *brother*

share the same phonological form derived from the semantics of *same*.¹²⁶ Although these kin terms are expressed in a similar phonological form, Norwegian Deaf people do discriminate between collateral kin terms with spoken Norwegian mouthings (personal observation). Another kin relations: TANTE ‘aunt’, ONCLE ‘uncle’, KUSINE ‘cousin-feminine’, and FETTER ‘cousin-masculine’, express using the same phonological form, and Norwegian Deaf people do discriminate these respective kin terms with spoken Norwegian mouthings (personal observation). Both sets of kin terms phonologically overlap in handshape, location, and movement. The latter set consists of a dominant handshape moving twice on top of a stative non-dominant handshape. This raises the possibility that this form may be lexicalized from the term for siblings.

Norwegian Sign Language expresses both gender and numeral marking and also does not use initialized handshapes with any kin terms.

¹²⁶ Noting the handshape of ‘1’ in the form, it is possible that it entails numeral marking, but it appears to be circumstantial due to no evidence beyond this set further supports this conclusion.

Russian Sign Language

Kinship terminology in Russian Sign Language¹²⁷ (Russkii Zhestovyi Yazyk, RZY) reveals 19 identified kin terms motivated by person terms. Most Russian kin terms mark gender by location. The lower facial area marks feminine, while the upper facial area marks masculine.

Out of 10 reported female kin terms, eight female kin terms are situated in the lower facial area. The sign *mother* is semantically derived from the person term for *woman*, retaining all phonological features except for the movement and a slight difference in the location. The handshape of *mother* taps on both ipsilateral and contralateral areas of the chin, while *woman* taps twice in the center of the chin area. Four female kin terms, *mother*, *sister*, *grandmother*, and *aunt*, express in a holistic form, and are all marked feminine. Four female kin terms for *granddaughter*, *cousin-feminine*, *stepmother*, and *wife*, use constructions with two lexical units in sequence.¹²⁸ These female kin terms exploit the person term for *woman* in the initial position in the

¹²⁷ Russian Sign Language appears to have more than one language variation in the country, and this set of RZY kinship lexicon probably could be from Ukraine (Evgenia Prozorova, personal communication).

¹²⁸ The spousal kin term for *wife* and *husband* realize a combination of gender marking and a conceptual domain by metonymically producing a ring being put on the marriage finger, symbolizing *marriage*.

construction except for *stepmother*, realizing the female person term in the final position.¹²⁹

These described constructions of two lexemes also express a male person term, producing *grandson*, *cousin-masculine*, and *stepfather*. *Daughter* is the only female kin term that does not exploit the feminine marking expressed in the lower facial area. The phonological structure of *daughter* overlaps with the form of *son*, locating in the ipsilateral area of the chest, suggesting the first descending kin terms renders a different semantic domain. The location of the ipsilateral chest marks first descending kin terms.

The location of most male kin terms takes places on the forehead, motivated by the person term for *man*. Six male kin terms for *father*, *brother*, *uncle*, *husband*, *cousin-masculine*, and *stepfather* are located in the forehead area, indicating masculine marking. Kin terms for *husband*, *cousin-masculine*, and *stepfather* produce two distinct lexical units, demonstrating no phonological reduction. The signs of *father*, *uncle*, and *brother* are expressed in a holistic form. However, the form of *brother* experiences phonological reduction observed in the combination of two lexical units: [gender + *same*], indicating lexicalization took place.

Departing from the described category of male kin terms, three other male kin terms do not exploit the forehead location in order to mark masculine. They are *son*,

¹²⁹ Gender marking appears to be prevalent in Russian Sign Language, extending to other constructions of *nurse-feminine* and *secretary-feminine*.

grandfather, and *grandson*. These three male kin terms map to semantic domains other than male person terms.

Sibling kin terms for *sister* and *brother* resemble the phonological structure of a singular holistic form except for the initial location where gender is marked. From the initial location, the dominant hand moves down to contact the non-dominant hand situated in the neutral space. The second lexical unit in *sister* and *brother* appears to represent the sign for *same*. The construction shows two types of phonological reduction in the movement between two components and handshape assimilation of the forms of *male* and *female* from a full hand to an index finger. If this finding is accurately represented, then *sister* and *brother* are constructed of a lexicalized compound: [gender + *same*].

Using constructions from sibling kin terms, the collateral kin terms for *cousin-feminine* and *cousin-masculine* are produced with two lexical units embedding gender marking, in the final position. The lexical unit preceding sibling kin terms appears to express numeral incorporation, realizing a handshape of ‘2’ with no indication of phonological reduction between these two lexical units; however, native Russian signers need to be consulted to confirm this conclusion.

Comparing the signs of *granddaughter* to *grandson*, both forms map to the metaphorical domain of ‘a continuing line’ in the final position of the two-lexeme construction. However, *grandson* expresses the first descending kin term of *son*, while *granddaughter* exploits the female person term. The discrimination in both second

descending kin terms raises an interesting question about the motivation of their constructions.

Although the second ascending kin term for *grandmother* is located in lower facial area, specifically on the cheek, it does not exploit other phonological features observed in female person and kin terms, indicating the possibility of mapping to another conceptual domain beyond gender marking. The grandparental kin term for *grandfather* does not overlap any phonological structures observed in male person or kin terms, indicating that *grandfather* does not derive from the same semantic domains observed in person and other kin terms.

Most kin terms that share the same domain of person terms are expressed with the handshape of ‘B’ (a full extended hand), except for sibling terms and kin terms for *aunt* and *uncle*. The handshape of *aunt* and *uncle* realizes extended index and middle fingers suggesting that handshape marks the domain of ascending collateral kin terms.

Kinship terminology in Russian Sign Language expresses gender marking through location, constructs kin derived from person terms, but does not exploit initialized handshapes with any kin terms.

Swedish Sign Language

According to the 18 kin terms identified in Swedish Sign Language (Svenskt Teckenspråk, STS), location and handshape of kinship terminology discriminates between nuclear and non-nuclear kin terms.

The female person term for *woman* frames to an iconic description of woman's breast. In contrast, the male person term *man* does not reflect on the masculine physique, but instead maps to another conceptual domain. The form for *man* realizes with a bent full hand situated on the forehead; moving along sagittally as the hand closes into a flat closed handshape. Person terms do not motivate Swedish kin terms except for *brother*, *sister*, and *father*.

Sibling terms for *brother* and *sister* exploit location of male and female person terms to denote gender in sibling terms. The form for *brother* realizes with a dominant curved index finger moving from the forehead to the non-dominant curved index finger situated in the neutral space; overlapping with the forehead to mark *male*. Similar to *brother*, *sister* move from the ipsilateral clavicle to the neutral space; exploiting the location of ipsilateral chest in *woman* to mark *female*. As both sibling terms encode gender, there is another term for *sibling* contains no reference to gender; realizing the form in neutral space with no mapping to either forehead (*male*) or ipsilateral chest (*female*). The sibling terms for *brother* and *sister* encode both semantic properties of *sibling* and gender motivated by person terms while the form for *sibling* refers only to the semantics of *sibling* not gender.

Another pair of kin terms that differentiate by gender is *mother* and *father*. The form *man* motivates the term for *father* mapping on the location of the forehead; suggesting semantic derivation took place. In contrast, the term for *mother* shows no phonological overlap with the form for *woman*; indicating a different semantic motivation. However, the forms for *father* and *mother* resemble each other except for location as they overlap with the same full handshape of ‘B’ and move in an arc. Location specifies gender where the forehead marks *father* and the chest area for *mother* in the initial position; however, both terms locate on the chin in the final position.

While *mother* and *woman* do not show any phonological overlap, an alternative explanation could account by taking the consideration that the form of *mother* may have experienced a historical change of location displacement. For signed forms located below the neck, Frishberg (1975) describes a linguistic generalization of the body displacement to “become more centralized about the line of bilateral symmetry, and moves up toward the hollow of the throat” (p. 703). An examination of an older form of *mother* will be needed to determine if *mother* experienced complex linguistic processes; indicating historical change to the form of *mother*.

Patterns reveal that lineal kin terms overlap with location on the chin. Lineal terms include *father*, *mother*, *offspring*, *daughter*, and *grandfather/grandmother*.¹³⁰

¹³⁰ Swedish kin terms are glossed as PAPPA ‘father’, MAMMA ‘mother’, MORMOR/FARMOR/MORFAR/FARFAR ‘grandmother/ grandfather’, DOTTER/SON ‘daughter/son’, and DOTTER ‘daughter’.

Father moves in an arc path from the forehead to the chin, while *mother* moves arc-wise from the chest to the chin. The final position of both parental terms ends on the chin. The form for *daughter* resembles *mother* except the initial and final location points are reversed. The full hand of 'B' marks parental and offspring terms, but not sibling terms, as it expresses with curved index fingers. The handshape marks the domain of parental and offspring kin terms. Distinct forms specified by gender contain only paternal terms, *sister*, *brother*, and *daughter* while other Swedish kin terms remain gender neutral.

The gender-neutral term for *grandfather/grandmother* exploits the chin area; expressing with a closed fist handshape. The closed fist also produces first descending terms for *offspring*. While both terms overlap in location and handshape, they differ in movement where the grandparental term taps up on the chin while *offspring* moves from the chin straight down to neutral space. Movement discriminates between first descending and second ascending lineal kin terms. A general description shows the location on the face that marks first and second ascending kin terms along with first descending kin terms; defining lineal kin terms in Swedish Sign Language.

Swedish discriminates between affinal and consanguineal collateral kin terms that may be differentiated by familial lineage. There are five lexical variants of consanguineal collateral kin terms; identified as one variant of *mother's sister*, two variants of *mother's sister* and *father's sister*, one variant of *father's brother*, and one variant that includes both parent's siblings as described in Appendix G9 Table G47.

Table G47

Phonological structure in consanguineal collateral kin terms in Swedish Sign Language

Kin Term	Handshape	Location	Movement
<i>mother's sister-1</i>	full hand of 'B'	chest	1 movement of straight down
<i>mother's sister-2</i>	claw	chest	2 movements of straight down
<i>mother's sister or father's sister-3</i>	dominant: closed fist dominant: closed fist	neutral space	dominant: 2 arcs; contacting non-dominant non-dominant: stative
<i>mother's sister or father's sister</i> <i>mother's brother or father's brother-4</i>	spread hand of '5'	chest	3 taps
<i>father's brother</i>	index finger; bending to closed fist	ipsilateral side of mouth	2 movements of straight down
<i>aunt</i>	index finger	ipsilateral side of the nose	2 taps

Patterns reveal that different semantic domains motivate these kin terms. Consanguineal kin terms may be specified by either maternal or paternal lineage as they are descriptive terms. Three variants of consanguineal terms overlap in location on the chest suggest a shared semantic property. Interestingly, there is a distinct form of *aunt* that does not overlap with any other consanguineal kin terms; suggesting the function as an affinal term. There is no lexical entry that refers to male kin who marry into the family.

Few Swedish kin terms express in neutral space; mapping to other semantic domains. KUSIN 'cousin', SLAKT 'extended family', and FRU 'wife' are also produced

in neutral space. The phonological structure in *cousin* and *extended family* are similar except for the handshape. The handshape of *cousin* is produced with two pinky fingers, while the index fingers are expressed in *extended family*; indicating a shared semantic domain. Both *cousin* and *slakt* are classificatory terms. As for the spousal form for FRU ‘wife’, the descriptive term maps onto a metonymic domain by depicting a wedding ring on the ring finger to denote a married woman.

Swedish Sign Language marks lineal kin terms by location, handshape specifies paternal and offspring terms, but does not exploit initialized handshapes with any kin terms.

APPENDIX G10: DESCRIPTION OF BRITISH, AUSTRALIAN AND NEW ZEALAND SIGNED LANGUAGES KIN TERMS

Past studies explored the linguistic relationship among three signed languages of British, Australian, and New Zealand, and found them to be closely related. The close relationship rests on the high degree of lexical similarity, two-manual alphabetic system, and grammar by the import of a language variety of 19th century Britain. Reflecting the historical roots of these closely related signed languages, these language varieties of British, Auslan and New Zealand has evolved into dialects of one signed language family that is categorized as BANZSL (Johnston & Schembri, 2007). In the meantime, these signed languages by tradition have been examined separately by various linguistic studies (Johnston & Schembri, 2007; McKee & Kennedy 2000).

British Sign Language

Based on 15 British kin terms reported, the foundation of British terms in British Sign Language (BSL) is based on initialized forms in accordance to the British two-manual alphabet.

The BSL dictionary describes person terms for *man*, *woman*, *boy*, and *girl*. There are two lexical variants of *man*. The first variant expresses with a closed fist from the chin to neutral space; mapping to an iconic description of a man's beard. The second variant realizes with an extended thumb with short arc movements down on the chin; illustrating a shared domain as observed in the first lexical variant. Sharing a similar semantic domain as *man*, the overlap of chin area motivates the construction of *boy* as it forms with a bent index finger where the radial side of the finger brushes on the chin. However, the term for *boy* also semantically extends to *son*. The term for *son* forms identically to *boy* that contains one movement instead of two movements seen in *boy*; indicating lexicalization took place by the phonological reduction of movement. The semantic domain of *man* and *boy* overlaps by the location of the chin area while other phonological features differentiate adults from young males.

In contrast, two lexical variants of *woman* do not show any phonological overlap between these two forms and contain different motivations. The first variant of *woman* conveys a bent full hand with two short arc movements down on the ipsilateral clavicle, while the second variant expresses with an index finger situated on the ipsilateral cheek with several short arc movements. The second variant of *woman* also refers to *girl* as

there is no distinct form for *girl*; indicating mouthing components discriminate between adults and young females.

British kin terms that robustly construct using initialized forms include: *mother*, *father*, *daughter*, *cousin*, *grandfather*, *grandmother*, *parents*, and *cousin*. Along with *cousin*, parental and offspring terms produce using an initialized handshape of the first orthographic representation of written English form; realizing with ‘M’, ‘F’, ‘D’, and ‘C’ for *mother*, *father*, *daughter*, and *cousin* respectively. Grandparental terms and the term for *parents* construct using a combination of two initialized handshapes.¹³¹ All lineal terms situate in neutral space while the collateral term for *cousin* realizes on the contralateral clavicle. Compared to lineal terms realized in neutral space, the location of *cousin* on the clavicle indicates a marked category.

The remaining British kin terms do not exploit initialization, but map to different semantic domains. Reference to *uncle*, *aunt*, *niece*, and *nephew* is produced by one sign; functioning as polysemous. The collateral term expresses with index and middle fingers located on the chin with two arc movements; discriminated by mouthing components to

¹³¹ Within the combination of two initialized constructions, the movement of first initialized handshape is phonologically reduced from two movements to one. While in constructions of *grandfather* and *grandmother*, the second initialized handshape ‘F’, ‘D’ (for granddad), and ‘M’ retain two movements. However, in the construction of *parents*, both initialized handshapes of ‘M’ and ‘F’ retains two movements, suggesting the translation of *parents* is better described as *mother* and *father*.

specify kin relation (Adam Schembri, personal communication).¹³² The index and middle fingers also contain internal movement by closing the fingers' digits into a hooked form as the fingers contact the chin. The collateral kin term locates on the chin while lineal kin terms realize in neutral space; demonstrating an interesting pattern unlike that seen in other signed languages.

Although *brother* is produced in neutral space similar to other initialized kin terms, the handshape with two closed fists and extended thumbs indicates that the phonological structure of *brother* maps to a semantic domain other than that seen in initialized kin terms. As for *sister*, its phonological structure conveys a handshape of a hooked index finger tapping twice on the nose, indicating no phonological overlap to other kin terms. The distinct phonological structure of *sister* is possibly motivated according to a different semantic domain. Neither sibling kin term depicts any phonological overlap with person terms.

The forms of *family* and *spouse* do not exploit initialized handshapes, but reflect motivation by iconic properties. The term for *family* exploits an image schema of a circle located in neutral space. The form for *spouse* represents an action of a ring being put on the marriage finger; mapping to the metonymic domain of *marry*. As there is one form specifying *spouse*, the form is marked as gender-neutral as it may refer to either *husband* or *wife*. In contrast, the formation of *mummy* is produced with a full hand tapping on the

¹³² Schembri explains that the collateral kin term for *uncle*, *aunt*, *nephew*, and *niece* contains a polysemous function in some BSL varieties.

ipsilateral forehead as iconicity as motivation is in question; raising a question about the discourse function of *mummy* as compared to *mother*.

British Sign Language robustly constructs lineal kin terms with initialized handshapes in neutral space while other non-lineal kin terms frame using different conceptual mappings. Person terms do not motivate British kin terms except for *son*.

Australian Sign Language

The signed language in Australia is referred as Auslan. The Auslan dictionary incorporates lexical variants from different regions in Australia; reporting 28 kin terms. Australian kinship terminology reveals a myriad of influences by British and Irish Sign Languages and Australasian Signed English (ASE).

Out of 29 Australian kin terms, 21 kin terms are robustly produced with an initialized handshape; representing the first orthographic form (letter) in written English. Terms overlapped with initialized handshape include some lexical variants of *aunt*, *cousin*, *daughter*, *family*, *father*, *grandfather*, *grandmother*, *mother*, *nephew*, *niece*, *nephew/niece*, *parents*, and *uncle*.

The forms of initialized handshapes may be realized either one-manual or two-manual alphabetic system; however, the two-manual alphabetic system, which is identical to the British system, appears to be preferred for fingerspelling in Auslan. The one-manual alphabetic system was introduced to Auslan in 1875; marking the establishment of schools for the deaf by Irish Catholic priests and nuns (Johnston & Schembri, 2007). Johnston and Schembri (2007) inform that two-manual alphabetic system imported from British Sign Language is predominantly employed for fingerspelling in Auslan, not the one-manual alphabetic system. In contrast, the one-manual alphabetic system itself is restricted in language use. The Australian Catholic schools ceased to educate deaf children in 1950's whereas the one-manual system was typically used among older deaf

Australians (Johnston & Schembri, 2007).¹³³ The manifestation of the type of manual alphabetic representation reveals language influence by British or Irish Sign Language; constructing Auslan kin terms by either one-manual or two-manual alphabetic forms.

There are two types of manual alphabetic system that produce Auslan kin terms. These kin terms are categorized by specific phonological structures as described in Appendix G9 Table G48.

¹³³ Johnston & Schembri (2007) illustrate an excellent historical account of language import of British and Irish Sign Languages, and other signed languages.

Table G48

Categorization of kin terms by types of manual alphabetic systems in Auslan

Two-Manual Alphabet System		Holistic Form of Two-Handed	One-Manual Alphabetic System	
One Initialized Handshape	Sequence of Two Initialized Handshapes	Symmetrical Initialized Handshapes	One-handed Form	Two-handed Form
<i>father-1,</i>	<i>grandmother-1,</i>	<i>aunt-1</i>	<i>aunt-2</i>	<i>father-2</i>
<i>mother-1</i>	<i>grandmother-2</i>	<i>uncle-1</i>	<i>uncle-2</i>	<i>mother-2</i>
<i>daughter</i>	<i>grandfather-1,</i>	<i>family</i>	<i>cousin</i>	
	<i>grandfather-2</i>		<i>niece-1</i>	
			<i>nephew-1</i>	
			<i>nephew/niece-2</i>	
			<i>parents-1</i>	

The first set of kin terms is produced with two-manual initialized kin terms located in neutral space. The phonological properties inherent in the two-manual alphabetic system appears to be displaced only in neutral space; affecting constructions of two-manual kin terms located in neutral space by default. Terms for *grandfather*, *grandmother*, and *parents* sequentially realize two initialized handshapes of the two-manual alphabetic system.¹³⁴ Two-manual alphabetic system constructs lineal and ascending collateral kin terms.

¹³⁴ Within the combination of two initialized constructions, the movement of first initialized handshape is phonologically reduced from two movements to one. While in constructions of *grandfather* and *grandmother*, the second initialized handshape ‘F’, ‘D’ (for granddad), and ‘M’ retain two movements.

The second set of kin terms produce with one-manual initialized handshape; categorized into two subsets of constructions. The first subset expresses with two-handed signs of one-manual initialized handshapes; constructing paternal kin terms. Both *mother* and *father* locate in neutral space where one wrist crosses over the other wrist; tapping on the wrists twice.

The second subset forms *aunt*, *uncle*, *cousin*, and *niece/nephew* with ‘A’, ‘U’, ‘C’, and ‘N’ respectively. Located on the chin, these forms share a similar phonological structure with the initialized handshape moving straight horizontally from the contralateral to ipsilateral position of the chin. These collateral kin terms resemble Irish kin terms; illustrating the historical influence of Irish Sign Language. One-manual initialized kin terms contact on the signer’s face, while one-manual alphabetic system produces descending collateral kin terms.

There is one distinct form for *niece*, one distinct term for *nephew*, and one term denoting both *niece* and *nephew*. One form for *niece* exploits *girl*; overlapped with the initialized handshape of one-manual ‘N’. The term for *nephew* overlaps the form of *boy* but with an one-manual ‘N’ handshape. As a gender-neutral term for *niece/nephew*, this form expresses with an one-manual initialized handshape of ‘N’ contacting from ipsilateral to contralateral points on the chin. Some Auslan signers may prefer to fingerspell out the entire word in the two-manual alphabet system: N-I-E-C-E and N-E-P-

However, in the construction of *parents*, both initialized handshapes of ‘M’ and ‘F’ retains two movements, suggesting the translation of *parents* is better described as *mother* and *father*.

H-E-W (Schembri, personal communication). The term for *son* is also produced by fully fingerspelling with all three two-manual alphabetic forms: S-O-N.

The remaining set of Auslan kin terms that do not exploit initialization includes: *mummy*, *brother*, *sister*, *spouse*, and *family*. The term for *mummy* produces with a full hand tapping on the ipsilateral forehead comparable to British Sign Language. The motivation for forming *mummy* is unknown; however, it prompts an interesting question to examine the function of *mummy* as opposed to *mother* in various types of discourses.

The forms of *brother* and *sister* are identical in British and Australian Sign Language. While the form *brother* is produced in neutral space similar to other initialized kin terms, the handshape with two closed fists and extended thumbs illustrates that the phonological structure of *brother* maps to a semantic domain other than seen in initialized kin terms. The form for *sister* shows no phonological overlap with any other kin terms as *sister* realizes a handshape of a hooked index finger tapping twice on the nose; suggesting that it maps to a different semantic domain.

Iconicity drives the constructions of *family*, *spouse*, and *husband*. The form for *family* maps to the conceptual domain illustrating a schematic circle consisting of family members. The form for *spouse* exploits the metonymic mapping of a wedding ring on the pinky finger; denoting gender-neutral married person. In contrast, there is a spousal term specified for *husband*. *Husband* forms with a full hand moving into the ipsilateral armpit; mapping to a different conceptual domain.

Auslan person terms for *man* and *boy* overlap in location of the chin. The form for *man* produces with a closed fist moving down from the chin to neutral space; mapping to

an iconic description of a man's beard. Two lexical variants of *boy* overlap in location on the chin and handshape of an index finger. The first variant of *boy* conveys with two straight movements from ipsilateral to contralateral points of the chin while the second variant realizes the finger pad of the index finger tapping on the chin. The location of chin area motivates the constructions of male person terms in Auslan.

Auslan contains three lexical variants of *woman* and two lexical variants for *girl*; motivated by different domains. The first variant expresses a bent full hand moving down the ipsilateral cheek. The second variant produces with an index finger situated on the ipsilateral cheek with several short arc movements. The third variant of *woman* conveys using a bent full hand with two short arc movements down the ipsilateral clavicle. The first form for *girl* locates on the forehead with several taps by a bent index finger. The second variant situates on the contralateral cheek; constructed similar to the second variant of *woman*, but differentiated by location and palm orientation.

Initialized handshape productively construct Auslan kin terms by two types of manual alphabetic systems; illustrating a montage of historical influences from British and Irish Sign Language. Sibling and spousal terms do not exploit initialized handshapes, but instead map to semantic domains. None of Auslan kin terms overlap with person terms.

New Zealand Sign Language

New Zealand kinship terminology identifies 29 kin terms, which also include lexical variants. New Zealand Sign Language constructs kin terms with initialized handshapes of the two-manual alphabetic system.

New Zealand contains a person term for *man* and two lexical variants of *boy*. The form for *man* realizes with a closed fist from the chin to neutral space; mapping to an iconic description of a man's beard. The location of the chin area is also motivated in the first variant of *boy*; formed with a bent index finger where the radial side of the finger brushes on the chin. The second variant of *boy* illustrate no phonological overlap in both *man* and another variant of *boy*; indicating different semantic motivation. The second variant of *boy* expresses with a full hand circling with an internal movement of wrist twists located in lower ipsilateral neutral space with no contact to the signer's boy.

The form for *woman* realizes with a bent full hand located on the center of the chest; brushing down with the thumb two times. The first variant of *girl* produces with an index finger located on the ipsilateral cheek with several short arc movements. Identical in phonological structure seen in the first variant, the second variant differs by location and palm orientation; situating on the contralateral where the palm faces toward the signer. The third variant contains no phonological overlap with other two variants as the full hand flicks up and down in the proximate area by the ipsilateral side of the face; indicating a different motivation than in seen in other two variants. There is no phonological overlap between *woman* and *girl*.

Out of 29 New Zealand kin terms, 18 kin terms overlap with initialized handshapes. These kin terms are produced by either the two-manual or one-manual alphabetic systems; revealing an emergent pattern of categorization of kin terms that overlap with either the two-manual or one-manual alphabet. Appendix G9 Table G49 illustrates kin terms categorized by specific types of manual alphabet systems and their phonological structures.

Table G49

Categorization of initialized handshape constructions in New Zealand Kin Terms

Two-Manual Alphabet System		Holistic Form of Two-handed	One-Manual Alphabetic System
One Initialized Handshape	Sequence of two Initialized Handshapes	Symmetrical Initialized Handshapes	One-handed Form
father	parents-2	aunt-1	cousin
mother	granddaughter-1	aunt-2	nephew
daughter	granddaughter-2	uncle-1	niece
	grandson	uncle-2	parents-1
	grandfather	family	
	grandmother		

Eighteen New Zealand kin terms overlap with initialized handshapes; categorized into subsets based on kin construction. The first category concerns the two-manual alphabet system producing kin terms; divided into three subsets. The first subset includes three nuclear kin terms for *father*, *mother*, and *daughter* as the forms only illustrate initialized handshapes of ‘F’, ‘M’, and ‘D’ realized in neutral space. The second subset describes constructions of two initialized handshapes expressed in a sequence; producing

six terms for *granddaughter*, *grandchild*, *grandfather*, *grandmother*, and *parents*. For instance, *granddaughter* conveys both initialized handshapes of ‘G’ and ‘D’. In the case of *grandson*, the term constructs using an initialized handshape of ‘G’ followed by the signed form for *son*. The third subset contains two terms for *aunt* and *uncle*. These terms produce a symmetrical two-handed formation by contacting the selected fingers; specifying either ‘A’ or ‘U’.¹³⁵ Two-manual initialized handshapes construct lineal and ascending collateral kin terms.

The second set involves the one-manual alphabet that constructs kin terms for *cousin*, *nephew*, and *niece*. These collateral kin terms realize on the chin. The terms for *cousin* and *nephew* produce contacts of contralateral and ipsilateral points of the chin similar to that seen in Irish Sign Language. This finding indicates an import of Irish Sign Language in New Zealand kinship terminology. The form for *niece* is identical to the British form with index and middle fingers brushing down on the chin. One-manual initialized kin terms locate on the chin area; marking descending collateral kin terms.

The remaining set of New Zealand kin terms maps to other semantic domains; illustrating no motivation by initialized handshapes. Kin terms are: *mother*, *father*, *son*, *brother*, *sister*, *spouse*, and *family*. The term for *mother* produces with an index finger located on the ipsilateral forehead as also seen in British and Australian Sign Languages.

¹³⁵ The two-manual representations of vowels consisted of ‘A’, ‘E’, ‘I’, ‘O’, and ‘U’ realize with a pointing of an index finger on the thumb (for ‘A’), index finger (‘E’), middle finger (‘I’), ring finger (‘O’), and the pinky finger (‘U’).

The form for *father* derives from the person term for *man*; overlapping by the location of the chin. As for *son*, the form expresses with spread index and middle fingers of ‘V’; twisting the hand in an arc movement from the center of the chest to neutral space. These parental and offspring terms are motivated by other conceptual domains.

The New Zealand sibling terms for *brother* and *sister* are identical to British and Australian Sign Languages. While the form *brother* is produced in neutral space similar to other initialized kin terms, the handshape with two closed fists and extended thumbs illustrates that the phonological structure of *brother* maps to a semantic domain other than seen in initialized kin terms. The form for *sister* shows no phonological overlap with any other kin terms as *sister* realizes a handshape of a hooked index finger tapping twice on the nose; suggesting that it maps to a different semantic domain.

The terms for *spouse* and *family* are motivated by iconic properties. The term for *spouse* illustrates an image schema of a marriage ring on the hand; mapping to the semantic domain of *marry*. There are three lexical variants of *family* that all exploit the iconic description of circular formation. The first variant realizes with a spread hand encircling in neutral space. The second variant overlaps with two-manual initialized handshapes of ‘F’; expressed with both hands. The third variant constructs from two signs of *family* and a form reflecting an enclosed container. Evidence demonstrates that iconicity does motivate New Zealand kin terms.

New Zealand Sign Language productively constructs kin terms with both two-manual and one-manual alphabetic systems; revealing import of British and Irish Sign Languages. Sibling terms, spousal term, and some variants of parental terms frame on

different semantic domains with no motivation by initialization. None of New Zealand kin terms derive from person terms except for *father*.