

**“Sign Languages of Western Highlands, Papua New Guinea,  
and their Challenges for Sign Language Typology”**

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This thesis is submitted in partial fulfilment of the requirements for the degree of Master of General and Applied Linguistics (Advanced) in the College of Arts and Social Sciences.

I hereby declare that, except where it is otherwise acknowledged in the text,  
this thesis represents my own original work.

All versions of the submitted thesis (regardless of submission type) are  
identical.

A handwritten signature in black ink, appearing to read 'LWR', written in a cursive style.

Lauren W. Reed

25 June, 2019

## ETHICS STATEMENT

The ethics of this project were approved by the Human Research Ethics Committee of the Australian National University (2018/084), with a variation added in September 2018 for work on Papua New Guinea Sign Language in Port Moresby. The information sheet and consent form are provided in Appendixes A and B.

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## ABSTRACT

The diverse sign languages (SLs) between established deaf community SLs and homesign have been called the “grey area” of SL linguistics, by virtue of their resistance to classification and the fact that they are understudied (Nyst, 2010, p. 416). This thesis investigates the languages of 12 deaf people living in the Nebilyer/Kaugel region of the rural Papua New Guinea highlands, with the view to situating them within the extant sociodemographic typology of SLs. I do this by considering sociodemographic data of deaf individuals, comparison of sign bases to determine lexical consistency, and emic perspectives of users. As a result of these analyses, I find that the diverse but interrelated languages of these 12 deaf people are not well classified within the existing sociodemographic taxonomy of SLs. In order to expand that taxonomy, I first present the concept of a *sign network*, which is a network of strong and weak *sign ties*, with strength defined as the presence of fluent, regular signed communication between individuals, irrespective of deaf/hearing status. I offer the new category of a *nucleated network SL*, the sign network of which is characterised by a central deaf individual with multiple strong sign ties to other individuals, who prototypically are all hearing. This is differentiated, I argue, from a canonical homesign language such as David’s (Goldin-Meadow, 2003), which is characterised by only weak sign ties to other individuals, either deaf or hearing. As such, I advocate for the extension of Horton’s (in press) typological category of “individual homesign” to account for regular contact not only with deaf signers, but hearing ones as well.

In determining the degree of lexical consistency between SLs, I present the metric of *sign base comparison*, predicated on the idea that even in iconic signs, there is a measure of arbitrariness underlying which aspect of a referent is selected (cf. Planer & Kalkman, 2019). This is a useful tool for work with SLs whose users exhibit a high degree of intra-signer variation in form, and thus cannot be well compared using the standard model of sublexical parameter comparison (cf. McKee & Kennedy, 2000; Guerra Currie, Meier, & Walters, 2002). I account for the high level of lexical consistency between Nebilyer/Kaugel SLs with the notion of a *regional sign network*, which is a sign network characterised by an abundance of weak sign ties between individuals in a larger region. I propose that signs diffuse along these weak sign ties, which accounts for lexical consistency between the languages of largely unconnected deaf people and their networks. The regional sign network model provides an explanation for similarly reported degrees of lexical consistency in other rural SL situations, where this cannot be explained wholly in terms of independent invention or recruitment of majority community gesture (e.g. Osugi, Supalla, & Webb, 1999). This research enriches the sociodemographic typology of SLs, filling in missing links in the “grey area”, and offering tools to continue to do so (Nyst, 2010, p. 416). More broadly, it also contributes to our understanding of how patterns of human sociality condition language shape.

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# CHAPTER ONE:

## INTRODUCTION

Papua New Guinea (PNG) has a staggering degree of linguistic diversity. Just 0.1% of the world's population, on 1% of earth's land mass, are speakers of a full 10% of the world's languages (Eberhard, Simons, & Fennig, 2019; Hammarström, Forkel, & Haspelmath, 2019). While hundreds of PNG's spoken languages have been documented to some extent, there is only one published study of a signed language (SL) of PNG; namely, that of Adam Kendon (1980a, 1980b, 1980c), based on fieldwork in 1975. In 2018, I travelled to PNG for 10 weeks of linguistic fieldwork in an attempt to redress this imbalance. This thesis is based on my work with 12 deaf signers living in a rural area of the PNG Highlands.

In approaching SL documentation in PNG, I heeded James Woodward's advice that:

*... if we know nothing about the sign language situation in Viet Nam, our first question should not be "What does the structure of Vietnamese Sign Language look like?" Rather, it should be "How many sign languages are there in Viet Nam?"*

(Woodward, 2011, p. 48)

I have previously worked with spoken language documentation in PNG (Reed, 2017a, 2017b; Lindsey 2017; Reed & Lindsey, in press). It is an unacknowledged privilege of spoken language linguists to be able to enter a community and, with a few questions to consultants, be able to report with a good degree of confidence how many varieties are being used there and their likely relationship to other neighbouring ones (but cf. Rumsey, 2010). When considering SL use in my study area, however, Woodward's question quickly became curly. I realised that SLs used by deaf people differed greatly in terms of linguistic complexity, which seemed to be tied to the degree of regular interaction deaf people had, not with other deaf people, but with capable hearing signers. Deaf signers were scattered among communities and had little contact with one another, yet their SLs had many shared signs.

I turned to the sociodemographic taxonomy of SL types for advice, both to identify the types of languages used by these 12 deaf people, and to explain the high frequency of shared signs among these largely unconnected deaf signers. What I found is that the existing taxonomy did not adequately capture the situation in this area of PNG. As such, my research questions are: How can we situate the SLs used in Western Highlands within the existing sociodemographic typology of SLs? And if they are not well situated, how can that typology be expanded, both to capture this particular situation and to potentially better describe other SL situations worldwide, both documented and undocumented?

This research explores more generally how language shape and character is a product of human patterns of interaction. By virtue of not fitting into other major sociodemographic categories, the SLs I worked with seemed like they would inevitably be classed as “homesign”, understood as the ad-hoc inventions of linguistically isolated deaf people. However, I found that SLs in this rural area did not accord well with classic homesign descriptions. At the same time, they were too diverse to subsume under one banner of “rural home sign”, as posited by Nyst, Sylla, & Magassouba (2012, p. 268).

In order to describe SLs both in PNG and elsewhere, I first offer the concept of a *sign network*, which is a web of strong and weak *sign ties*, where strength is defined as the existence of a) regular and b) fluent signed communication between individuals at either end of the tie. In a sign network, deaf/hearing status is largely irrelevant, but signing status is. In addition, I argue for the extension of the concept of “individual homesign” (Horton, in press) to take into account the presence or absence of regular, mutually fluent signed interaction not only with other deaf signers, but with hearing signers as well. I present the concept of a *nucleated network sign language*, which is a SL with one central deaf individual at the nucleus of a sign network of adept hearing signers with whom they communicate fluently. One nucleated network SL in my study area shows an intriguing level of complexity, yet is only one generation old. This seeming paradox can be addressed, however, when we consider how social factors shape language structure.



In addressing the question of whether signs are shared or not, I discard the common method of sublexical parameter comparison (e.g., McKee & Kennedy, 2000; Guerra Currie, Meier, & Walters, 2002; Johnston, 2003), as these young SLs do not have a stable phonological system. In this case, I instead advocate comparison of *sign base*; base being the underlying iconic concept that the sign is derived from. Finally, I present the concept of a *regional sign network*, which links hearing and deaf signers across a larger area. I show that the high degree of shared signs in the region cannot be due to independent invention or recruitment of majority community gesture, but rather is better explained via a process of diffusion across the larger regional network. Again, this shows how considering patterns of human interaction may unlock the mystery of why languages are shaped the way they are (cf. Meir, Israel, Sandler, Padden, & Aronoff, 2012).

The thesis is organised as follows. In Chapter 2, I present a brief ethnographic overview of the region.<sup>1</sup> In Chapter 3, I summarise the existing sociodemographic taxonomy of SL types. In Chapter 4, I present methodologies, results and discussion of my three sources of data: sociodemographic interviews, base comparison, and emic<sup>2</sup> perspectives on SL use. Chapter 5 synthesises the data and presents the aforementioned new

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<sup>1</sup> Note that throughout this thesis, where I use §, the first number refers to the chapter. Any subsequent numbers following a dash refer to the section within that chapter.

<sup>2</sup> ‘Emic’ here refers to an insider or “native” perspective, and can be contrasted with ‘etic’, which denotes an outsider or observer perspective (cf. Kottak, 1999, pp. 12, 280). These terms are used in the literature with many divergent meanings (see Headland, 1990, pp. 20-24).

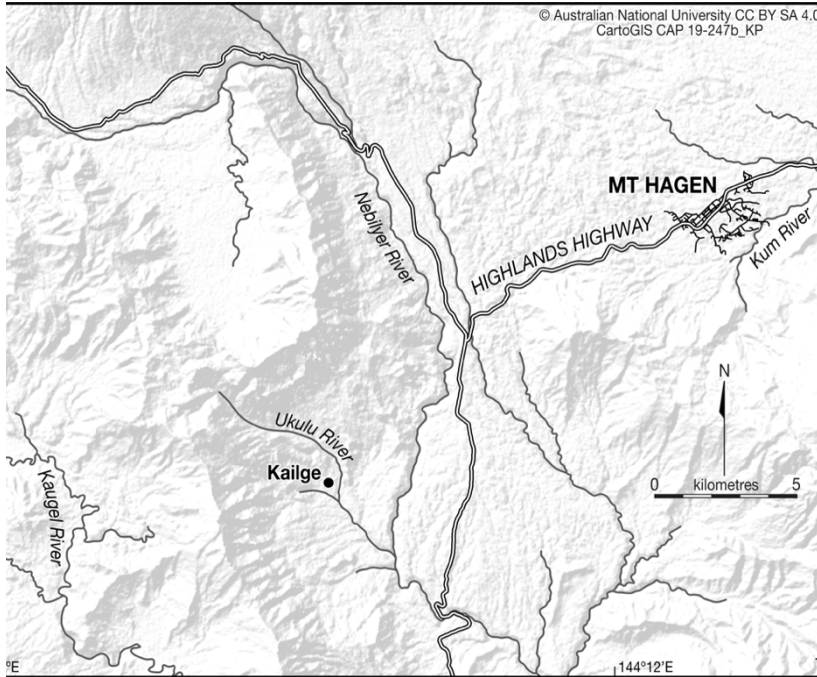
concepts which I believe necessary to adequately situate these SLs of PNG within the sociodemographic typology of SLs, and which enrich that typology. Chapter 6 concludes the thesis with directions for future work and a call to action on sign language endangerment.

An important caveat is that I do not make a distinction between ‘(sign) system’ and ‘(sign) language’. ‘System’ is often used to refer to homesign languages. My definition of language is broad and deliberately non-evaluative: I define language as any meaningful practice humans do to communicate (cf. Moriarty Harrelson, 2017; Kusters, Spotti, Swanwick, & Tapio, 2017; Kusters & Sahasrabudhe, 2018). As such, the diverse, creative, flexible ways deaf people communicate worldwide *is* language. Similarly, it is common in the literature to refer to homesign languages as having ‘gestures’, not ‘signs’. Deaf people, whether homesigners or users of an established SL, perform actions that are “discrete units...which [convey] particular meanings” (Goldin-Meadow, 2012, p. 604). These actions are transposable to different contexts, are not tied to the here-and-now, and recur consistently in the deaf person’s daily language use. As such, these actions warrant the label ‘sign’, not ‘gesture’ (Goldin-Meadow, 2012, p. 604).

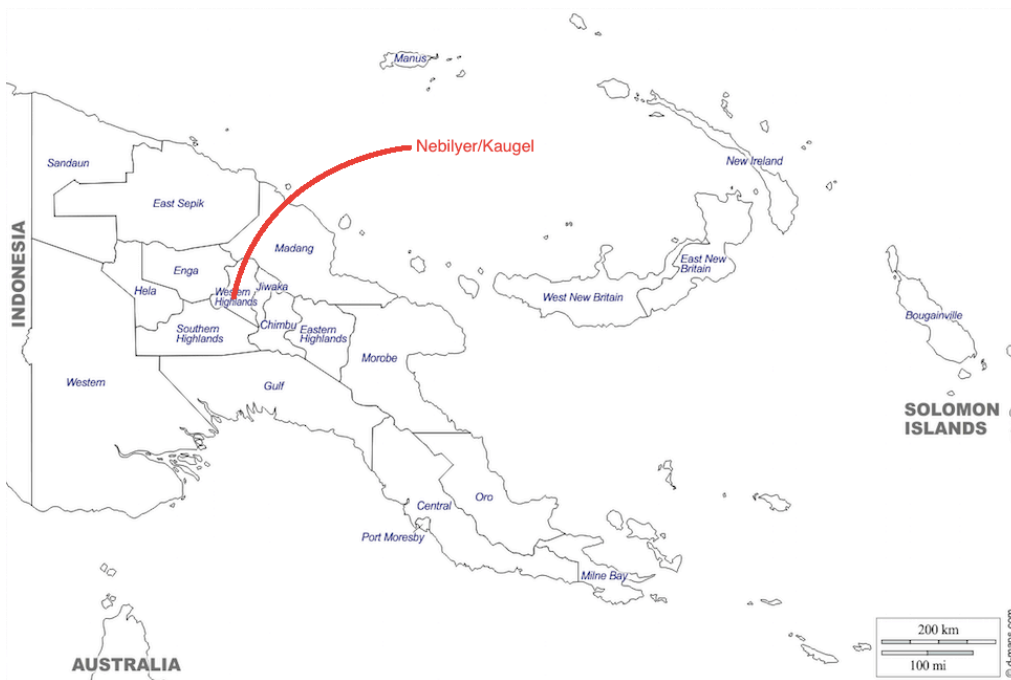
**CHAPTER TWO:**  
**THE LOWER NEBILYER AND KAUGEL VALLEYS,**  
**WESTERN HIGHLANDS, PAPUA NEW GUINEA**

Here I give a brief overview of the study area. For further ethnographic work on this region and nearby, the reader is referred to A.J. Strathern (e.g., 1971, 1972), A.M. Strathern (e.g., 1972), Merlan and Rumsey (e.g., 1986, 1991), Rumsey (e.g., 2001, 2013), and Merlan (2016).

The lower Nebilyer and Kaugel Valleys in Western Highlands Province, PNG, are rural areas west of the provincial capital Mount Hagen. Map 1 shows the study area and Map 2 its location within PNG. The most recent census in 2011 records 29,765 people living in “Mount Hagen Town” (National Statistical Office, 2014, p. 26). Based on a rough estimate of its percentage of the administrative district in which it lies, perhaps 10,000 people live within the boundaries of the area (excluding Mount Hagen) shown in Map 1 (National Statistical Office, 2014, p. 28). Throughout this thesis, I refer to the study area as “Nebilyer/Kaugel”.



Map 1: The study area (Nebilyer/Kaugel)



Map 2: The study area within wider PNG and its region (Underlying map: d-maps.com, 2007-2019; red annotation by Lauren Reed)

Both valleys are intensively cultivated; there is evidence of agriculture in the PNG Highlands for at least the last 10,000 years (Golson, Denham, Hughes, Swadling, & Muke, 2017). People generally live in homes with woven cane walls and thatched roofs located on their smallholdings, where they farm sweet potato, taro, corn, sugarcane and other vegetables; tend coffee trees for cash cropping; and raise pigs and chickens. Figure 1 shows a typical Highlands home, and Figure 2 a sweet potato garden. Pigs are a major form of wealth and a status symbol, because they are laborious to tend and require vast quantities of fodder daily. Families and clan groups live clustered together in small hamlets but the hamlets are fairly evenly spread out across the area; there are no extended family compounds like those in Chatino Mexico, for example (Hou, 2016, p. 34). Figure 3 shows the approach to Kailge Primary School; note the expanses of open land surrounding it.



Figure 1: Typical Highlands home, Kubu, lower Nebilyer Valley (photo: Lauren Reed, November 2018)



Figure 2: Sweet potatoes growing at Winjaka, lower Kaugel Valley (photo: Lauren Reed, November 2018)



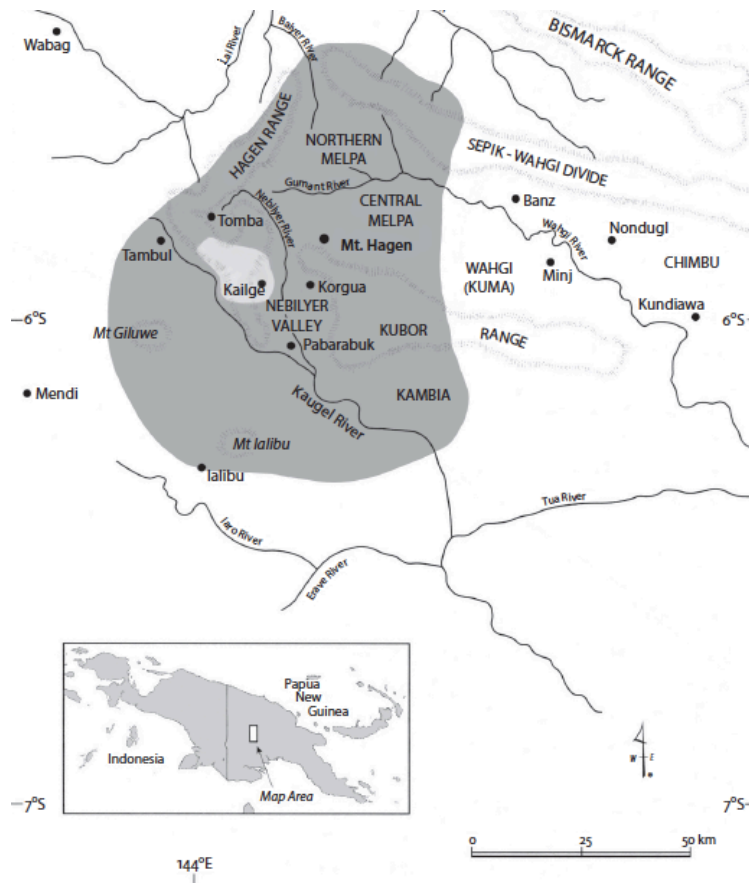
Figure 3: Approaching Kailge Primary School (photo: Alan Rumsey, undated)

When women marry, they usually leave their home community for that of their husband. Regular marriage patterns exist, such as the common pattern of marriage of women from the lower Kaugel Valley to men in the lower Nebilyer Valley. People belong to a tribe; some tribes are further segmented into clans, and clans into *haus man* (Tok Pisin, ‘men’s house’; *lku tapa* in Ku Waru).<sup>3</sup> *Haus man* refers to the traditional custom of related men and older boys living together in longhouses while their wives, children and pigs lived in individual homes (this is no longer practised in the area). Tribes are associated with areas of land; Kailge is the place of the Kopia tribe. Within the Kailge area, clans are associated with smaller pockets of land within the larger tribal area. The indigenous spoken language of the study area is Ku Waru, which is part of a larger dialect continuum made up of some 250,000 people (Merlan & Rumsey,

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<sup>3</sup> For more detailed discussion, see Merlan and Rumsey (1991, pp. 34-56).

2017, pp. 311-313).<sup>4</sup> Most people of middle age or younger are bilingual in Tok Pisin, an English-lexified creole and one of PNG's national languages. Map 3 shows the area where Ku Waru is spoken (light grey) and the borders of the larger dialect continuum (dark grey).



Map 3: Spoken languages of the study area and the wider region (Merlan & Rumsey, 2017, p. 312)

<sup>4</sup> Ku Waru is a Trans New Guinea language which exhibits clause chaining, switch reference, and optional ergative marking. For more information see Merlan and Rumsey (1991, pp. 322-372; 2017), and Rumsey (2010), and on Trans New Guinea languages, Pawley and Hammarström (2018).



My base for this work was the community of Kailge (see Maps 1 and 3). This is around one hour by public truck from Mount Hagen, which is in turn served by commercial airliners and connects via the Highlands Highway to the coastal port cities of Lae and Madang. My supervisor, linguistic anthropologist Alan Rumsey, and his partner and collaborator, anthropologist Francesca Merlan, have been doing research at Kailge since 1981. Rumsey made recordings of sign language being used at Kailge in 2015, after first noticing it in the late 1990s. I began working with these recordings in 2017, and in April 2018 travelled to Kailge with Rumsey and Merlan for one month of dedicated sign fieldwork. I returned to the Highlands in November 2018 for two weeks after a four-week fieldtrip to Port Moresby where I was working on documentation of Papua New Guinea Sign Language.<sup>5</sup>

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<sup>5</sup> Papua New Guinea Sign Language is an emerging deaf community sign language (see §3-1) used by deaf communities in Port Moresby and Lae, and by smaller deaf communities in other urban centres including Madang and Wewak. It has grown out of an imported Australasian sign system, Signed English, with influence from Tok Pisin and local SLs. For further information, see Reed and Rumsey (in press).

## **CHAPTER THREE:**

### **SOCIODEMOGRAPHIC TYPOLOGY**

### **OF SIGN LANGUAGES**

SLs have only been the subject of dedicated linguistic inquiry since the 1950s, beginning with the work of Tervoort (1953) and Stokoe (1960). Since then, and increasing in the 2000s, a key focus within sign linguistics has been sign typology.<sup>6</sup> Typology is the sorting of languages into types, with the aim of then being able to compare them in a systematic way (Comrie, 1989, p. 33; Velupillai, 2012, pp. 1-2). Languages can be divided into classes on many different bases; for example, according to whether they have no gender system, a sex-based gender system, or a non-sex-based gender system (Corbett, 2013).

Pfau and Zeshan (2016) provide an overview of sign typological work, including constituent orders (Napoli & Sutton-Spence, 2014), interrogatives and negative constructions (Zeshan, 2006), and complex syntactic structures such as relative clauses (Pfau, Steinbach, & Herrmann, 2016). Research into diverse SLs, such as those used in small rural communities with high incidences of deafness, gives typologists richer data to analyse and broadens our understanding of the human language capacity (de Vos & Pfau, 2015; Zeshan, 2008).

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<sup>6</sup> See McBurney (2012) for an overview of the history of sign linguistics.

Another strand of sign typological research involves sorting SLs into types not on structural grounds, but on sociodemographic ones (de Vos & Zeshan, 2012b; Meir, Sandler, Padden, & Aronoff, 2010; Nyst, 2012). Sorting sign languages into types allows us to compare ‘like with like’. In this way, we can compare how sign languages used in sociodemographically similar but geographically diverse rural communities may pattern similarly or differently; to reveal how different social conditions may give rise to different linguistic features. As stated, my research aim in this thesis is to determine where SLs in Western Highlands fit in the sociodemographic typology of signed languages. Hence, it is important to present the SL types attested in the literature thus far.

Of note, here I exclude discussion of alternate sign languages; that is, those used overwhelmingly between or among hearing people (Kendon, 1988, pp. 7-8). Alternate SLs include those used by Indigenous Australians in various contexts, including during ritual and when under speech taboo (e.g., Green & Wilkins, 2014); those used by indigenous North Americans, including for communication across spoken language boundaries (Davis, 2010); those used in monastic orders where speaking is restricted (Quay, 2015), that used in a noisy workplace environment (Meissner, Philpott, & Philpott, 1975a, 1975b) and that used by the Ts’ixa in Botswana during hunting (Mohr, 2015).

Alternate sign languages may become primary when they are used for communication by deaf people living in those communities, as in the case of Yolngu Sign Language (Adone & Maypilama, 2014, pp. 14-16). For reasons of

space, and because their primary site of use is among hearing people, alternate sign languages are excluded from further discussion here.

### **1. Deaf community SLs**

*Deaf community SLs* are used overwhelmingly by deaf people, for communication with other deaf people. Meir, Sandler, Padden and Aronoff (2010) describe them as arising when “unrelated signers of different backgrounds come together in one place” (p. 270). This often occurs in the context of deaf education, as in the case of Nicaraguan Sign Language, which emerged when deaf children were brought together for the first time in a national residential deaf school (Senghas, 1995; Kegl, Senghas, & Coppola, 1999; Senghas & Coppola, 2001). Deaf community SLs are often associated with a culturally d/Deaf identity, where deafness forms a core tenet of personal and community identity, rather than being experienced purely as an auditory phenomenon (cf. Woodward, 1982; Padden & Humphries, 1988; Ladd, 2003; Woll & Ladd, 2003).

Many deaf community SLs are also *national SLs*; that is, a SL explicitly associated with a nation-state. National SLs of this kind include American Sign Language (ASL), Israeli Sign Language (ISL), and Auslan (Australian Sign Language). Although national SLs are associated with the nation-state, other SLs may exist within the borders of the same nation-state. For example, the village SLs Al-Sayyid Bedouin Sign Language and Ban Khor Sign Language

co-exist, respectively, with ISL in Israel and Thai Sign Language (TSL) in Thailand (Meir et al., 2012; Nonaka, 2014). There are deaf community SLs which are not national SLs. This is the case for Hausa Sign Language, which is used by deaf communities in northern Nigeria, but which is not a national SL of Nigeria (Schmaling, 2015).

*Original SL* was a term coined by Woodward (1996) to refer to SLs used by small deaf communities that existed in urban areas of Thailand prior to the inception of TSL. TSL is described as “a mixture of [Original Bangkok Sign Language], [Original Chiangmai Sign Language] and ASL in the early 1950s” (Woodward & Suwanarat, 2015, p. 679). Ultimately, original SLs are a type of deaf community SL. The term ‘original SL’ is only useful when discussing SL relationships that are predicated on age/genealogy; that is, a SL is only ‘original’ where there is another, newer, co-located SL to contrast it with.

*Urban SL* refers to SLs used primarily in urban areas, usually in a context of contrasting them to sign languages used in rural areas (e.g., Dolman, 1986; Jepson, 1991a). De Vos and Zeshan (2012) see urban and rural SLs’ “distinctive origins” as the core factor underlying the dichotomy between the two: “segregated formal deaf education, and informal shared signing use, respectively” (p. 6). This is murky, however. Original Bangkok Sign Language is an urban variety in the sense that it was used in an urban area, but it does not fulfil de Vos and Zeshan’s (2012) criterion of an urban SL; that is, having a “distinctive origin” in “segregated formal deaf education” (p. 6). Similarly,

Malian Sign Language is used by urban deaf communities in Mali, but it has arisen entirely outside of the context of deaf education (Nyst, 2015, p. 134-135). The core feature of an urban SL is that its sphere of use is a deaf community, whether that deaf community is a result of deaf education or clustering in an urban area. Therefore, an urban SL is a type of deaf community SL.

*Macro-community SLs* is a term coined by Fenlon and Wilkinson (2015, p. 16) to refer to SLs whose spheres of use are the nation-state (Japanese Sign Language) or large urban communities (Hong Kong Sign Language, Hausa Sign Language in Nigeria). The authors associate macro-community SLs with the experience of deaf children coming together in residential schools and also with the formation of deaf clubs as sites of socialisation (Fenlon & Wilkinson, 2015, pp. 16-17). Essentially, this is another kind of deaf community SL, as defined above.

While most deaf community SLs are multigenerational, it is unclear whether a deaf community SL must by definition be used over multiple generations. Reed and Rumsey (in press) describe PNG Sign Language (PNGSL), whose site of use is very much a deaf community, but which is only one generation old (see Footnote 5 on p. 12). Hence, I argue that while most deaf community SLs are multigenerational, they do not need to be so.

All these terms fundamentally refer to one meta-type of SL, the primary feature of which is that it is used mainly between deaf people, or in other words, within a deaf community. I conclude that the canonical features of this type of SL are:

- a. Used primarily by deaf people, for communication with deaf people
- b. A network of users who are mostly not related to one another
- c. Often associated with education, institutionalisation, and the nation-state
- d. Often associated with urban areas
- e. Usually multigenerational

## **2. Village SLs**

There are many competing terms for SLs used in rural areas, including *village SL* (Zeshan, 2011), *rural SL* (de Vos & Pfau, 2015), and *shared SL* (Nyst, 2012). This section aims to map the maze of terminology. I choose ‘village SLs’ as the title for this section, as this is arguably the first term that was coined to describe these kinds of non-deaf community, non-urban SLs. Village SL is still a term widely used by sign linguists working in rural areas, albeit in my opinion often erroneously when one considers the features of a canonical deaf village. For example, it is the category term used by language database Glottolog to classify some 52 SLs used in rural areas, many of which do not fit the ‘deaf village’ scenario (Hammarström et al., 2019).

“Village SL” was coined by Zeshan (2004, p. 43) in referring to Kata Kolok, a SL used in the village of Bengkala in Bali, Indonesia, which has a high incidence of hereditary deafness (Marsaja, 2008; de Vos, 2012). The canonical “deaf village” (Branson, Miller, & Marsaja, 1996) is a community in which there is a high incidence of congenital deafness and a resultant local SL. The high incidence of deafness is often a result of a genetic anomaly that proliferates down the generations, meaning that canonical village SLs are multigenerational. Canonical village SLs include or included Providence Island, Colombia (Washabaugh, 1979); Martha’s Vineyard, USA (Groce, 1988); Adamorobe, Ghana (Nyst, 2007); and the Al-Sayyid village, Israel (Sandler, Meir, Padden, & Aronoff, 2005; Kisch, 2012). While these communities’ isolation has arguably been overstated (Kisch, 2008, pp. 286-287), they are all characterised by use within a geographically and socially quite tightly bounded community.

As more rural signing communities are described, however, it is becoming clear that most do not fit the canonical “deaf village” profile (de Vos & Zeshan, 2012a, p. 3). For example, Inuit SL is not used in a discrete village, but rather in at least three geographically widely dispersed communities in remote northern Canada (Schuit, 2012a, 2012b, 2015). As such, *rural SL* is gaining traction as an alternate term, as it encompasses a more diverse range of sites than ‘villages’. However, rural SLs are still defined as those used in communities with high incidences of deafness (de Vos & Pfau, 2015, p. 267;



de Vos & Nyst, 2018, p. 477). It perhaps follows, therefore, that a SL used in a rural area *without* a high incidence of deafness is technically not, by the standards of the literature, a ‘rural SL’.

Another term recently proposed is *micro-community SLs*, which are said to be used in “small labour-intensive economy-based communities, with a much higher incidence of deafness than that seen in developed countries and urban communities” (Fenlon & Wilkinson, 2015, p. 18). Again, due to the reference to ‘high incidence of deafness’, this term seems again essentially parallel to ‘village SL’ and ‘rural SL’. It is not clear if a micro-community SL can exist in a “small labour-intensive economy-based” community where there is a SL, but not a high incidence of deafness, e.g., where there is only one deaf individual residing in a given “small labour-intensive economy-based” community (Fenlon & Wilkinson, 2015, p. 18).

Other terminology used in this space focuses less on the physical geography of these types of SLs, and more on their social fora of use. Kisch (2008) describes a *shared signing community* as one in which SL fluency is widespread among both deaf and hearing community members. *Speech/sign community* (Nonaka, 2007) and *assimilating community* (Supalla, pers. comm., 1995, as cited in Bahan & Poole Nash, 1995) are other terms that reference core features of these communities; namely, that the proportion of hearing to deaf signers is high and that attitudes to deafness and SL are inclusive and positive. Of note, all of these terms were coined in the context of describing canonical deaf

villages (Al-Sayyid, Israel; Ban Khor, Thailand; and Martha's Vineyard, USA, respectively).

As mentioned, shared signing, speech/sign and assimilating communities are described as exhibiting a non-pathologising attitude towards deafness (Bahan & Poole Nash, 1995, p. 19; Kisch, 2008, pp. 307-308) and no distinct separate culturally Deaf identity (Nonaka, 2009, p. 212). However, it is important not to over-generalise these points to other rural signing communities. Kusters (2010) warns against romanticisation of these kinds of communities as “deaf utopias”; “dream village[s]” where “everybody signs”, “communicating effortlessly” with one another (van den Bogaerde, 2005, pp. 79, 83). In the canonical shared signing community of Adamorobe, Ghana, Kusters (2015) describes a shared attitude among deaf people that “DEAF SAME, HEARING BAD” (p. 95).<sup>7</sup> Even in this most archetypal shared signing community, there is a notion of deaf sociality, of deafness as a marker of identity.

It is unclear just how many deaf people need to reside in a given community for it to be classified as a shared signing community. Extending Kisch's (2008) shared signing community concept, Nyst (2012) coined the term *shared SL*, but went on to define this as a type of SL used in “communities with a high incidence of hereditary deafness” (p. 568). Again, we encounter the criterion of

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<sup>7</sup> Kusters (2015) explains this as “deaf people shared both positive and negative common experiences.... Hearing people were often regarded as ‘bad people’: they insult deaf people and have different values” (p. 95).

‘high incidence of deafness’ as a critical defining feature of this kind of SL. By this definition, then, ‘shared SL’ could not apply to a situation where there is a SL shared by a single deaf person and several hearing interlocutors within a given community, as there is no high incidence of deafness, hereditary or otherwise.

Green (2014) worked with deaf people in two adjoining rural areas of Nepal, Maunabudhuk and Bodhe. She found that the incidence of deafness in Maunabudhuk and Bodhe (0.8% and 0.6%, respectively) was similar to that in other communities with village SLs, including Ban Khor (around 0.6%) and Alipur, India (around 0.75%) (Green, 2014, pp. 78-79; Nonaka, 2012, pp. 282-283; Panda, 2012, p. 353). However, Green hesitated to label sign varieties of Maunabudhuk and Bodhe ‘village SLs’ because unlike other canonical deaf villages, deaf people in this region of Nepal do not have multiple deaf relatives, nor do they live tightly clustered together (pp. 79-82). At the same time, Green argues, because deaf people in these areas do have contact with one another and because “unrelated signers’ repertoires are more than incidentally conventional and mutually intelligible”, the signing in this area cannot be well characterised as homesign (which I discuss in depth in the next section) (pp. 82-84). Green settles on *local sign* as a descriptor for the sign varieties she worked with (pp. 84-86).

Another term, *indigenous sign language* (Woodward 2000; Nonaka 2009), is useful in contrasting a pre-existing sign language with an incoming one that

potentially originated in a foreign sign language. However, consider the fact that both Israeli Sign Language (ISL) and Al-Sayyid Bedouin Sign Language (ABSL) are indigenous to Israel. While there are traces of German Sign Language in ISL, it is overwhelmingly a home-grown language, just as is ABSL (Meir & Sandler, 2008, pp. 218-222).

I feel that while ‘village SL’ is warranted as a descriptive term for the relatively rare, canonical deaf village situations such as Adamorobe, Martha’s Vineyard and Bengkala, we need more precise terminology to describe the vast range of SLs in rural areas. Indeed, Nyst (2010) notes the same need, stating that “[t]he large grey area between the conventional and expanded sign languages of large Deaf communities on the one hand and the functionally more restricted homesign languages on the other has remained virtually unstudied, seemingly because we do not really know what to do with them” (p. 416). Nevertheless, in relation to those canonical cases it is useful to retain the category ‘village SL’, with the following features as definitional of it:

- a. A high incidence of deafness (hereditary or otherwise)
- b. A high proportion of hearing to deaf users
- c. Often a lack of deaf sociality or identity
- d. Canonically, a relatively bounded community in a rural area
- e. Classically multigenerational

In the rest of this thesis I use the term ‘village SL’ accordingly to refer to SLs that accord with this cluster of features.

### **3. Homesign**

Homesign has been most famously elaborated by the work of Goldin-Meadow and colleagues (Goldin-Meadow & Feldman, 1975, 1977; Goldin-Meadow & Mylander, 1983; Goldin-Meadow, Butcher, Mylander, & Dodge, 1994; Goldin-Meadow, 2003; Hunsicker & Goldin-Meadow, 2012; Goldin-Meadow, Brentari, Coppola, Horton, & Senghas, 2015; Goldin-Meadow & Yang, 2017). These studies focus on single deaf children raised in a non-signing environment, because the child’s parents are attempting to raise the child using an oralist method (that is, to teach the child to lipread and speak). Spoken language is inaccessible to deaf children without major intervention such as cochlear implantation and speech therapy. If this intervention is not done or is unsuccessful, children universally create signs to communicate with their hearing carers. Homesign has mainly been explored in the context of children living in the United States, with some work with children in Taiwan and Turkey (Goldin-Meadow & Mylander, 1998; Goldin-Meadow, 2003; Goldin-Meadow, Mylander, & Franklin, 2007; Goldin-Meadow, Namboodiripad, Mylander, Özyürek, & Sancar, 2015; Özyürek, Furman, & Goldin-Meadow, 2015). Other brief studies of homesigning children have been carried out in the Netherlands and Belgium (Tervoort, 1961), Australia (Mohay, 1982), and in

the United States with participants from Bangladesh and the West Indies (Morford, 1995).<sup>8</sup>

Studies of adult homesigners do exist, most notably the work of Coppola and colleagues in rural Nicaragua (Coppola, 2002; Coppola & Newport, 2005; Coppola, Spaepen, & Goldin-Meadow, 2013; Carrigan & Coppola, 2017). In addition, Yau (1992) worked with Indigenous Canadian and Chinese adult homesigners, and Fusellier-DeSouza (2001; 2006) with adult homesigners in Brazil.<sup>9</sup> However, I argue that the central focus of homesign in the literature has been the signing of children. This focus is an artefact of the fact that most linguistic research on signing populations has been carried out in more developed countries, where homesigning children have the opportunity to go on to join a deaf community and acquire that community's SL. For example, David, the child with whom Goldin-Meadow worked extensively, went on to acquire ASL as an adult (Morford, Singleton & Goldin-Meadow, 1995, as cited in Lederberg & Spencer, 2005, p. 127; also cf. Footnote 12 on p. 33 and Yau, 1992, p. 59). However, in the global south, this is not the case, for reasons of mobility or because a deaf community may not exist. Hence, with respect, I disagree with Coppola and Newport's (2005) characterisation of "deaf adults

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<sup>8</sup> In Morford (1995, p. 244), the places of origin of her two study participants are only given as "a third world country". However, Morford (1996, p. 166) reveals that their countries of origin were Bangladesh and the West Indies.

<sup>9</sup> Another body of literature is that of adolescent homesigners acquiring an established deaf community SL for the first time. See Morford (2003) for two case studies and Morford and Hänel-Faulhaber (2011) for an overview of literature.

who have used their home sign systems all their lives” as “very rare” (p. 19249). This situation is not at all rare globally. Rather, it is only rare to the extent it has been given attention in the academic literature.

Indeed, Nyst et al. (2012) suggest that the vastly different social conditions between children’s homesign in the industrialised world and homesign used by deaf adults in rural environments warrants an explicit differentiation between *oralist home sign* and *rural home sign* (pp. 268-270, 272). Working with deaf people in a rural area of Mali, Nyst et al. describe how the signing of many rural deaf people is quite different to oralist home sign, in part due to the fact that they live in a “gesture-prone” environment where gesture or sign is considered the normal way of communicating with deaf people, and not something to be avoided (pp. 268-269). However, there is significant diversity in the signing abilities of the deaf people in this rural area, which is not well correlated with the amount of contact they have with other deaf people. This is a sticking-point, which calls into question whether such diverse situations can be subsumed under one typological category of ‘rural homesign’.

In terms of features of canonical homesign, in many varieties, the complexity inherent in the language is not taken up by the deaf person’s regular interlocutors (Goldin-Meadow & Mylander, 1983; Coppola et al., 2013; Goldin-Meadow & Yang, 2017; Carrigan & Coppola, 2017). Frishberg (1987) emphasises this, stating that “the responsibility for the creation and maintenance of [homesign] lies primarily with the principal user, the isolated

deaf person” (p. 128). As such, she states, homesign cannot be standard as it is not shared by a community of users (Frishberg, 1987, p. 128). She goes on to give a list of homesign characteristics which include repetitiveness and a larger sign space, but notes that “[o]ver time, continued contact with the signer in a community (family, work site, or the like) would probably make the home sign system less markedly distinct from a more traditional sign language” (Frishberg, 1987, p. 130). In terms of generational depth, homesign is canonically assumed to be one generation old (Frishberg, 1987, p. 128; Nyst et al., 2012, p. 269).

Summing up, we can conclude that the canonical sociodemographic features of a homesign variety are:

- a. The product of a single deaf person not in contact with other deaf people
- b. Associated with children in nuclear families
- c. Characterised by one-way communication on the part of the deaf signer, and as such, characterised by frequently unsuccessful attempts at communication with her or his interlocutors
- d. Not transmitted intergenerationally

These features of canonical homesign are tested when the site of use is the family. Zincantec Family Homesign, dubbed “Z”, has emerged within a family among three deaf siblings and their hearing sibling, and it has been transmitted



intergenerationally to the siblings' hearing niece, nephew, and grandniece (Haviland, 2014, 2015, 2016a, 2016b, 2018). Likewise, Osugi, Supalla and Webb (1999) use the terms "home sign system" and "family home sign system" interchangeably to refer to the signing of a family with two generations of deaf members on Amami Island, Okinawa, Japan (p. 101). Hou (2016) extended Osugi et al.'s notion of "family home sign system" to offer *family sign language* as a new typological category, in order to capture the fact that the family is the primary site of use in these languages (pp. 20, 285-287).<sup>10</sup> Hou calls the cluster of family sign varieties in the San Juan Quiahije area of rural Mexico a "constellation of family sign languages", rather than arguing that they constitute one monolithic village SL (p. 17).

Horton (in press) differentiates between an *individual homesign system* and a *shared homesign system*, where the differentiating factor is whether the deaf individual has access to regular interactions with other signing deaf people (p. 10). Horton divides shared homesign according to whether it is experienced in a family communicative ecology, where the deaf person interacts regularly with related deaf individuals, or in a peer communicative ecology, where the deaf person interacts regularly with unrelated deaf individuals (e.g. in community spaces such as school or work) (pp. 10-11). Horton takes shared homesign in a family communicative ecology to necessarily include more than

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<sup>10</sup> This term was also used by Nyst et al. (2012, p. 271), in relation to a "deaf family" in rural Mali. Davis and Supalla (1995), working with a Navajo family with multiple deaf members, talk of "the family sign system" as distinct from the wider community's alternate sign language. Also cf. Hou (2016, p. 122) for other early studies on similar phenomena.

one deaf person, but it seems that in Hou's (2016) work, a family sign language does not necessarily need more than one deaf individual. One of the families with whom Hou worked had only one deaf member, and that deaf person did not seek out other deaf people for special communication (pp. 108-111).

Zeshan (2011) posited the notion of *communal homesign*, where deaf people "are in sporadic, unsystematic contact with one another", only meeting occasionally at major festivals or market days (p. 228). As an explanatory concept, communal homesign appears reliant on the contact of deaf signers to generate the system, rather than contact between deaf and hearing. Another piece of the homesign terminological puzzle is de Vos' (2012) brief proffering of *extended home sign*, which she suggests as a term for SLs used by multiple deaf individuals born in the same generation (pp. 42-43)

Rural homesign (Nyst et al., 2012), homesign in peer and family communicative ecologies (Horton, in press), and SLs where the site of use is the family (Haviland, 2013; Hou, 2016) confound categorisation as canonical homesign. Unlike canonical homesign, in rural areas, homesign may be used by adults and children. Both peer and family-based homesign varieties are unlikely to be characterised by one-way communication, given the presence of multiple deaf signers and evidence of lexical consistency within these varieties (Osugi, Supalla, & Webb, 1999, p. 102; Hou, 2016, p. 170; but cf. Horton, in

press). Family SLs are often transmitted intergenerationally (Davis & Supalla, 1995; Haviland 2016b, pp. 125-126).

Another challenge for the category of canonical homesign is the situation where there is one deaf adult in a rural area largely not in contact with other deaf people, whether by distance or by choice. I now detail five of these cases. Macleod (1973) describes Billy, a deaf man living in rural Yorkshire, who, “in order to communicate with the people of the village...uses a sign language of his own fabrication” (p. 72). Billy’s interlocutors, where mentioned, are hearing people who are not family members, and he is “accepted and looked after by the inhabitants of the village” (Macleod, 1973, p. 72). Similarly, Kagobai was the only deaf man on Rennell Island in the Solomons and, according to local oral history, the only deaf person to be born for some 20 generations (Kuschel, 1974, pp. 9, 14-16). Kuschel (1973) writes that “[Kagobai’s] interactions with the others in his village seems the best possible. He appears well liked by adults as well as children...When the adults sit and talk and [Kagobai] joins them, there is always someone who acts as his interpreter” (p. 6). Kagobai’s interactions were not restricted to a family setting.

Similarly to Kagobai, Mohan, a deaf man in a village in rural Rajasthan, India, has “little trouble communicating with co-workers, immediate family, close friends, and kin” (Jepson, 1991b, p. 50). Jepson reports that Mohan’s “family, kin, and close friends have been using his language consistently for many

years” and indeed, “the language was probably invented not by Mohan alone, but also by his parents and other family members” (p. 57). This confounds one of the canonical features of homesign; namely, that it is the product of a single deaf person, rather than a community of signers. Despite living in the same village as another deaf individual, Mohan has no contact with that young man, and their languages are very different structurally (Jepson, 1991b, pp. 52-56).

Nyst et al. (2012) worked with some 50 deaf signers in a rural area in Mali. They found significant divergence in signing skills, which was not tied to the degree to which a deaf person had contact with other deaf people. Some deaf signers have contact with those in surrounding villages while others, despite living in the same village, have little-to-no contact (Nyst et al. 2012, pp. 263-264). One man, Bakaye, is the only deaf person in his community yet “has excellent signing skills and communicates well with the hearing people in his and neighbouring villages” (p. 265). He visits his deaf cousin, Oumar, regularly in a neighbouring village, but Oumar has “limited signing skills” despite also having a deaf father (Nyst et al., 2012, pp. 264-265, 267).

Nyst et al. conclude that the signing of “fluent and less fluent hearing family and community members is likely to provide the main language input” to deaf people; that is, it is not contact with other deaf people that is the critical factor in language development (p. 267).

Yau (1992) worked with several Indigenous Canadian and Chinese deaf adults living in various communities. Similar to Nyst et al. (2012), he found

significant divergence in their lexicons. A striking case was that of Martha Pettikwi; and Yau collected some 1067 signs from her and her friend, husband and children (pp. 306, 251-302). Yau wrote that “[j]e sentais bien que cette [langue gestuelle] spontanée était beaucoup plus riche que toutes celles de même type que j’avais étudiées jusqu’alors” (p. 45).<sup>11</sup> Mme Pettikwi did not meet another deaf person until several decades into her life (Yau, 1992, p. 46). Her SL was used to a high degree of fluency by her aunt’s daughter, with whom Mme Pettikwi lived growing up; her two stepsons; her own six children; at least one granddaughter; and her two best friends (Yau, 1992, pp. 46, 53-54). Mme Pettikwi was married twice and lived an active life, working as a cleaner in hotels in a nearby town. Based on this case and those of others with whom he worked, Yau concludes that the size of a SL lexicon is related to the personality and activeness of the creator, the number of relatives and acquaintances they have, and the intensity of contact they have with other people (p. 228).<sup>12</sup>

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<sup>11</sup> “I really felt that this spontaneous gestural language was much richer than all the others of the same type that I had studied up until then.” [This and subsequent translations from French: Lauren Reed]

<sup>12</sup> Yau (1992) presents two other interesting cases, those of Li Jing, a 6-year-old deaf boy, and another 8-year-old deaf girl, living in Beijing, China. Yau recorded some 150 of Li Jing’s signs in a single two-hour session (p. 57), and upon returning a year later, found that Li Jing then had 294 signs (p. 59). The deaf girl, however, had only ten or so signs (Yau, 1992, p. 57). The deaf girl’s parents did not use any signing or gesture with their daughter, hoping she would instead learn to speak (Yau, 1992, p. 57). In contrast, Li Jing’s parents seemed to have tried to communicate with him in any way possible, including with sign and gesture (Yau, 1992, pp. 58-59); Yau reports that “[s]es parents s’amusaient des gestes qu’il avait créés” [his parents

The cases of Billy, Kagobai, Mohan, Bakaye, and Mme Pettikwi are the missing link in our typology of sign languages. These five studies are concerned with rural deaf adults who use their SL with people who are not exclusively family members. They also have little to no contact with other deaf people, whether by distance or by choice. They appear to be able to communicate about most things with most people with ease; their communication does not appear one-way. There is little in common between these cases and with oralist home sign such as that described for David and other linguistically isolated deaf children in the United States (Goldin-Meadow, 2003). In addition, I would argue that while Nyst et al. (2012) took a crucial step in splitting homesign into oralist and rural, there is too much diversity in homesign languages used in rural areas to be able to subsume all of these under one ‘rural homesign’ type. As this thesis unfolds, we will see how some Nebilyer/Kaugel SLs do not fit within the extant typology of sign languages I have outlined, and rather have more in common with the languages of Billy, Kagobai, Mohan, Bakaye, and Mme Pettikwi.

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enjoyed the signs he had created]. Li Jing went on to acquire Chinese SL at school (Yau, 1992, p. 59). Yau concludes that “il est important pour le développement d’une [langue gestuelle] que le sourd bénéficie d’un environnement ou d’un entourage qui favorise la communication en gestes” [it is important for the development of a gestural language that the deaf person enjoys an environment or a surrounding group of people who favour gestural communication] (p. 59).

Another challenging case for SL typology is that of Imanoli, the sole deaf woman living in a Highlands community in Enga Province, PNG, as described by Kendon (1980a, 1980b, 1980c). Her language has been classified alternatively as homesign (Hou, 2016, pp. 6-7; Nyst, 2007, p. 34) and a rural SL (de Vos & Nyst, 2018, p. 478). Kendon describes that Imanoli's language could be used "with full fluency" by Imanoli and "with varying degrees of fluency by members of her immediate family" (Kendon, 1980a, p. 4). However, the key here is that Kendon's field assistant, Ngangane Waipili, who had never met Imanoli and was from some 20 miles away, could "[understand] to a considerable extent" Imanoli's language, and "was familiar with the system because his sister was deaf" (pp. 4-5).<sup>13</sup> Hence, Kendon (1980a) concludes, "this shows that the gestural system we are dealing with is not confined to the Upper Lagaip region, but extends more widely in this part of the Enga area" (p. 5).

How do we explain this situation, where an unrelated hearing signer can communicate effectively with a deaf signer whom he or she has never met before? That is, how do we characterise the diverse but interrelated signing practices of deaf people scattered within a rural area? Nyst et al. (2012) noted lexical consistency among SLs in the rural area of Mali in which they worked, despite deaf people having little-to-no contact (and hence there being no

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<sup>13</sup> Adam Kendon confirms that his field assistant "Mr Waipili had never met Imanoli before. They lived in different parts of the valley... I am confident that Ngangane had never met Imanoli before" (pers. comm., 29 May 2019).

evidence of Zeshan's [2011] 'communal home sign'). Green (2014) noted the same ability of deaf people in Maunabudhuk and Bodhe to understand one another, despite their never having met (p. 84). In Mali, Nyst et al. (2012, pp. 268-269) hypothesise that this could be due to either deaf people's irregular contact, or due to "mainstream culture exploit[ing] an extensive, conventional vocabulary of gestures/signs to communicate with deaf people or others in the absence of a shared language". We will see in Chapter 4 that in Nebilyer/Kaugel, there is also a degree of lexical consistency between SLs of deaf people, whether they are in sporadic contact or have never met. This lexical consistency between largely unconnected SLs also poses an explanatory challenge for the existing taxonomy of SLs.



## **CHAPTER FOUR:**

### **METHODOLOGY, RESULTS, AND DISCUSSION**

In Chapter 3, I summarised the existing sociodemographic typology of SLs. Before any structural description is done on a SL, it is useful to situate it within the sociodemographic taxonomy of SL types. For example, by sorting SLs into ‘urban’ and ‘rural’, Zeshan (2013) showed most urban SLs take 10 as the base for numerals, while rural SLs are more diverse in which base they take. That finding would not have been possible without sorting SLs into those two categories, thereby showing the utility of doing so.

In order to do this for Nebilyer/Kaugel SLs, I draw on three sources of data. Firstly, I present sociodemographic data of the 12 deaf people I worked with, in the vein of Nyst et al. (2012, pp. 259, 262-266) and Hou (2016, pp. 53-69, 92-114). Secondly, I present the results of a lexical elicitation task, to establish the degree to which signs are shared between Nebilyer/Kaugel SLs, motivated by Osugi, Supalla, and Webb (1999) and Hou (2016, pp. 121-176). As comparative data, I include results from the same task I administered to deaf signers living in Port Moresby, the capital of PNG. Thirdly, I present emic perspectives on signing in Nebilyer/Kaugel, inspired by Cook (1966), Palfreyman (2015, pp. 53-54), Daniels (2016) and Johnson and Johnson (2016, pp. 488-489).

A fourth possible source of data is mutual intelligibility assessments between users. Assessing mutual intelligibility is not straightforward. My tentative assessment is that, in accord with Hudson (1996, pp. 35-36), mutual intelligibility of Nebilyer/Kaugel SLs is best explained not as a relationship between varieties, but a relationship between users. In my interview data, a report of ‘not understanding’ sometimes seemed due to a lack of *desire* to understand because of dislike of the signer. In this way, “unintelligibility is a product of active processes of reception as well as production of utterances” (Wirtz, 2007, p. 436). Similarly, much reported ‘understanding’ is sometimes, I believe, ascribable to signers greatly enjoying the act of conversing with someone they value, even if meaning is not actually well conveyed.<sup>14</sup> This is similar to a local understanding that some of the prosodic and paralinguistic features of certain speech genres have a metapragmatic function which overrides the literal meanings of what is said in them (Rumsey, 1986, on *el ung*, ‘fight talk’, especially p. 289). Additionally, it may accord with a reportedly widely-held PNG linguistic ideology that, in interaction, the responsibility for the construction and communication of meaning lies as much with the hearer as with the speaker (Robbins, 2001, p. 906 and references cited there). Because of the scope of this thesis, I put questions of mutual intelligibility aside for future work.

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<sup>14</sup> The dynamics of understanding and not-understanding among signers in rural Nepal are also explored at length in Green (2014).

## **1. Methodology**

When I arrived at Kailge, I found that Rumsey's main field assistant, John Onga, was aware of six deaf people in the local area. Over the course of four weeks in Kailge in April 2018, I used a snowball sampling or chain referral method to find other people to work with (cf. Nyst et al. 2012, p. 258). That is, I asked people if they knew any deaf people, and upon visiting those people, asked them if they knew other deaf people, and so on. This led to me working with 12 deaf people over the course of one month. I returned to Western Highlands in November 2018 for two additional weeks of fieldwork.

Each recording session proceeded as follows. I invited each deaf signer to attend with their choice of hearing signing companion. Consent was sought, with either the companion or one of my local signing research assistants interpreting. The project was approved by the Australian National University Human Research Ethics Committee (2018/084).<sup>15</sup> I conducted a sociodemographic interview with each deaf signer, which included recording of a genealogy, particularly to look for deaf relatives, and querying whether the consultant knew or was friends with other local deaf people. Following that, I presented my own Swadesh-style elicitation task, which is further described in the next section.

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<sup>15</sup> See Appendix A for information sheet and Appendix B for consent form.

While administering the wordlist and afterwards, I tried to initiate free conversation between or narratives from signers. The best way I found to do this was by setting up a camera and then leaving the room, recording signers without me being present, and then reviewing the material with them to translate it sign by sign. While the material was being reviewed, I video-recorded the review process, which captured meta-linguistic commentary. However, this method only worked with signers with whom I had built up good rapport. Emic perspectives were gathered over the course of each session, both directly (direct questioning) and obliquely (asides and comments signers made to me).<sup>16</sup>

Assisting me in the process were Alan Rumsey and Francesca Merlan, who translated the local spoken language Ku Waru to English; hearing Kailge man John Onga, who translated Ku Waru and Tok Pisin to English and who is also a competent local signer; and Simon Kaiya, a very adept hearing signer from Kailge. All participants were paid for their participation in the project and travel costs reimbursed.

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<sup>16</sup> My approach to fieldwork is informed and inspired by Hochgesang (2015), Hochgesang and McAuliff (2016), Hou (2016), Kusters (2012), Nyst (2015a), and Schembri (2010). For my definition of emic, see Footnote 2 on p. 4.

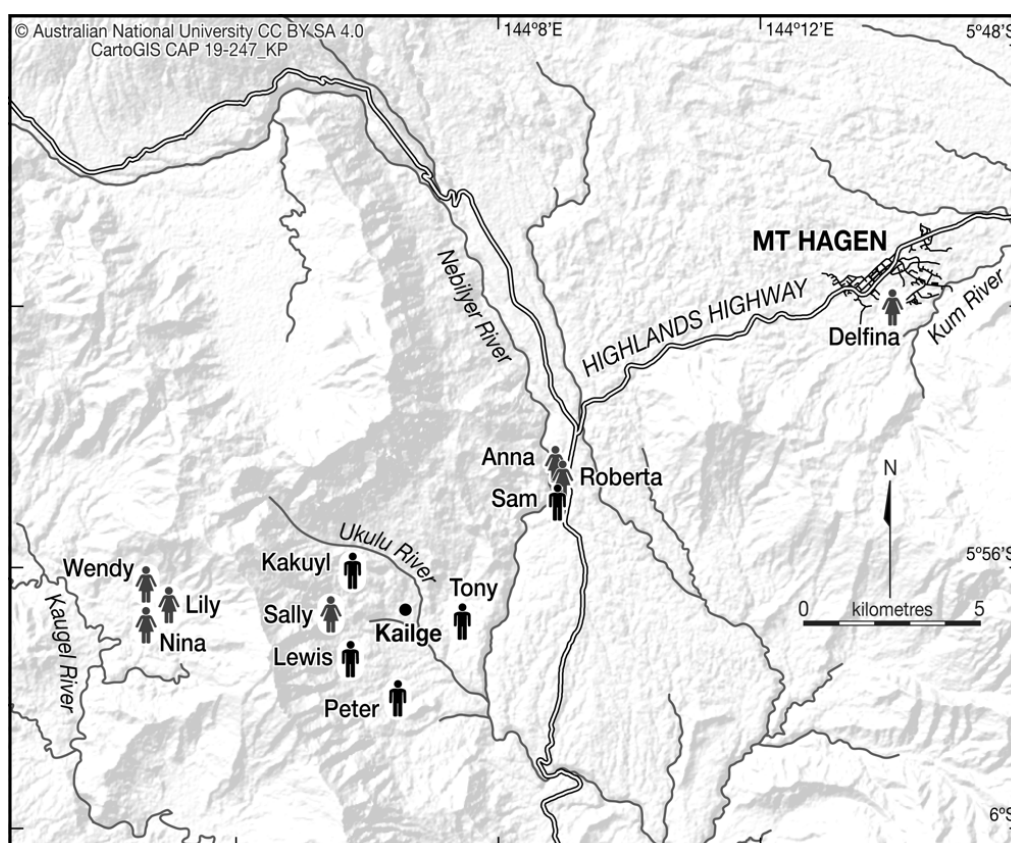
## **2. Sociodemographic data of deaf people in Nebilyer/Kaugel**

In this section, I present sociodemographic data of the seven deaf woman and five deaf men with whom I worked. I also include a short description of their language. I was interested in knowing whether certain settlements had high concentrations of deafness (a definitional feature of village SLs); whether deaf people had contact with one another (per communal home sign); or if families had multiple deaf members (as do most family SLs).

First, I present some generalisations. Exact age is not a salient feature of people's lives in this area and is often unknown; hence, all ages are estimates. Most people had little understanding of how they became deaf or at what age. Some participants reported becoming very ill and then being deaf after that (likely childhood meningitis, cf. Aithal, Gupta & Vele, 1995). Other ascribed causes of deafness were curses, or mothers taking medicine during pregnancy. Most deaf people with whom I worked have not learned to read or write (as have not many hearing people of middle age or older in this area). While I did ask participants if I could use their full name, it was not clear whether people understood this. Accordingly, I have used pseudonyms for most people, apart from those I was confident of consent.

I assumed that I would use deaf consultants as referrers, but deaf people often had little knowledge of other local deaf people. The usual response was that they did not know any, although with prompting it became clear that they did.

It became clear that there is almost no deaf sociality in this area (Friedner, 2011); that is, for the most part, deaf people do not seek each other out for special connection or companionship. In the end, I used hearing people as referrers, as many of them had good knowledge of where other deaf people were living locally. A further generalisation is that 11 of 12 deaf people in the area had no deaf relatives. Hence, there is no evidence for ‘strains’ of hereditary deafness. Map 4 shows the location and sex of deaf consultants.



Map 4: Location of deaf consultants

I now briefly outline my own sociodemographic characteristics and positionality. I am a hearing, white, Australian woman who is a native user of Auslan, having grown up in a signing family where my only two siblings are

deaf. My knowledge of a SL helped me to communicate with deaf people, as I am adept at cross-signing (Bradford, Sagara, & Zeshan, 2013; Byun, de Vos, Bradford, Zeshan, & Levinson, 2018). However, my status as a white Australian was challenging while in the field. Papua and New Guinea were Australian trust territories from 1906 and 1914 respectively until they became an independent country in 1975 (Woolford, 2013, p. 3). I found that as a white Australian I was often afforded overwhelming levels of deference, which was uncomfortable. The facts that a) white people rarely visit these rural areas and b) life in the Highlands is communal also meant that fieldwork sessions were challenging, with many curious onlookers.

In terms of local language competency, I learned Tok Pisin to a good degree of fluency, particularly during my time in October 2018 in Moresby. This means I can now understand my early field recordings better upon review. Working as a research assistant for Rumsey since 2017 on his child language corpus has also given me good passive understanding of Ku Waru, the local indigenous spoken language.

## **2.1 Kakuyl**

Kakuyl Kulup is around 45 years old. He lives roughly an hour's walk outside of central Kailge in the lower Nebilyer Valley, in an area called Ukulu which is populated by other members of his clan group, No Peng. He also has a home in central Kailge, where he stays occasionally. Kakuyl is the only deaf person

anywhere in Ukulu or Kailge, and has lived his whole life in the area. He supports his family through farming of sweet potato and other vegetables, raising of pigs, growing and selling coffee, and working as a carpenter locally. He is the only deaf person in his lineage. He reports that both his parents were very good signers, and that three of his five siblings are also very good. His brother Sap, who reportedly signs very well, lives nearby (but was in Moresby at the time of my visit). A sister, Dawn, who reportedly signs well, has moved to her husband's home a few hours away, and Kakuyl visits her occasionally. Cedric, Kakuyl's brother, was reportedly an excellent signer. He and Kakuyl lived together until Cedric was killed in tribal fighting roughly 13 years ago.

Kakuyl has four close childhood friends who are very good signers. Two of them, Win and Thomas, lived at Kailge until last year when they moved away to a neighbouring province, but they return to Kailge regularly. Kakuyl's two remaining local friends, Simon and Nikindi, live very close to him, and one of these friends (Simon) is extremely adept at sign. Kakuyl is married to Muna, who is an excellent signer, and they have six children (all hearing) who are all acquiring the SL. Kakuyl knows other local deaf people, including Lewis (§4-2.2) and Tony (§4-2.3), but not particularly well. He was friends with a deaf man in Mount Hagen, whom he would visit occasionally, but this friend has since died. I return to the network of signers surrounding Kakuyl in Chapter 5.

I worked with Kakuyl almost daily during my cumulative six weeks in the field at Kailge and environs. These included recording sessions with him and with



one or more people in his sign network, and with Tony (§4-2.3). In 2015, Rumsey made recordings of conversations between Kakuył and Simon, and Kakuył and Lewis (§4-2.2), which I have had the opportunity to analyse.

Kakuył’s language is heavily manual. A handful of signs have an oral component arising from Ku Waru or Tok Pisin, such as [wan] (Tok Pisin *wan*, ‘one’) articulated with ONE<sup>17</sup> and ['pamə] (Ku Waru *pamul*, go.1PL.HRT)<sup>18</sup> with LET’S-GO. Other mouth actions are unrelated to spoken language, including a bilabial trill with PIG and a rounded bilabial click with MORNING. Kakuył’s SL stands out from all the other SLs I investigated for its linguistic complexity, evinced by very tightly timed conversational turns; stacking of lexical oral signs with separate lexical manual signs; phonetic reduction of signs; and incorporation of number handshapes into lexical signs as a ‘stacking’ strategy to indicate ‘number of referent’. Videos of this SL in action

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<sup>17</sup> In accordance with SL linguistic convention, signs are given glosses in upper case (cf. Johnston, 2008), with hyphens separating parts of the gloss (not morpheme breaks as per spoken language linguistic convention). These glosses are crude translations and ideally should be indexed to a glossary providing full definition of signs. For example, the sign I gloss as WOMAN is more expansively defined as “woman; girl; human female”.

<sup>18</sup> Glossing abbreviations: 1 = first person; HRT = hortative; PL = plural. Ku Waru orthography and phonology are outlined in Merlan and Rumsey (1991, p. 323-324).

can be seen in Reed (2019a, 2019b, 2019c) and Reed, Rumsey, Merlan & Onga (2018).<sup>19</sup>

## 2.2 Lewis

Lewis is around 40 years old. He is from Kubu in the lower Nebilyer Valley, roughly thirty minutes' walk from Kailge. He now lives alone in Mount Hagen where he works at a store chopping up lamb flaps (imported fatty rib sections).<sup>20</sup> Lewis is unmarried. His mother is from the same clan as Kakuyl, and he recalls going to Ukulu as a child and playing with Kakuyl occasionally. There are no deaf people in his lineage.

Lewis has been good friends with hearing man John Onga since 1997, and Lewis visits John regularly at Kailge. Lewis does not know any deaf people in Mount Hagen. He occasionally sees Kakuyl during visits to Kailge but they do not consider each other close friends.

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<sup>19</sup> I exhort readers to watch Reed (2019a) or Reed (2019b) (respectively dubbed and dubbed/subtitled versions of the same video), which shows the fluidity and speed of Kakuyl's SL. These are available at <https://vimeo.com/344214788> and <https://vimeo.com/344214883>.

<sup>20</sup> I choose to situate Lewis at Kubu on Map 4, rather than at Mount Hagen. This is because he is in many ways still associated more strongly with his ancestral home, by virtue of his clan identity. This is in contrast with Delfina (§4-2.12) who, despite hailing originally from the upper Kaugel Valley, has lived most of her life in Mount Hagen.

In April 2018, I worked with Lewis and John Onga. In November 2018, Lewis, John Onga, Simon (§4-2.1) and I travelled to Lewis' birthplace in Kubu to do more recording. No-one in the community could sign, not even Lewis' older brother, whom I met. There were no other deaf people at Kubu.

Lewis' language is heavily manual. A handful of his signs have a mouth action related to ambient spoken words, including [ha] (from 'Hagen') which combines with an absolute directional point to indicate MOUNT-HAGEN, [amp] (Ku Waru *ab*, 'woman') with WOMAN, and [paip] (Tok Pisin *paip*, 'five') with FIVE. Other signs have co-occurring mouth actions which are unrelated to the ambient spoken language, including a sucking of the teeth with CHILD and a bilabial trill with PIG.

### **2.3 Tony**

Tony is around 40 years old. He lives at Palimung in the lower Nebilyer Valley, around 50 minutes' walk from Kailge. Tony is unmarried and lives alone. He is the only deaf person in his lineage and the only deaf person at Palimung. He works as a subsistence farmer. Tony's sister lives at Palimung, but despite my best efforts I was unable to work with her and Tony together, so I am unaware of her sign competency. Tony knows Kakuyɩ, having worked with him on construction of a local high school, but neither socialises with the other or considers the other a friend. Tony did not report any connections with other deaf people.

I worked with Tony for two sessions at John Onga's house in Kailge in April 2018, including free conversation between him, Kakuyi, and Simon. I also worked with him again in November 2018 when he travelled to Kailge with a hearing companion from Palimung, who was a poor signer.

Tony's language is heavily manual. I did not discern any words from any spoken language in his SL. Some signs are accompanied by mouth actions, including a bilabial trill with PIG.

#### **2.4 Peter**

Peter is around 50 years old. He lives at Kopola in the lower Nebilyer Valley, which is about 45 minutes' walk from Kailge. Peter is the only deaf person in his lineage and the only deaf person at Kopola. He travelled to Kailge to work with me for one session at Kailge Primary School, with a hearing companion. He reported that he was unaware of other local deaf people, although he recognised Kakuyi on a video. Peter is unmarried and lives with his sister. He works growing his own vegetables and fixing people's shoes. He is an inventive person who has constructed an elaborate, multi-coloured torch out of discarded globes, batteries and wire.

During our session, Peter preferred to speak Ku Waru words to his hearing companion and to me. His companion would speak Ku Waru to him with

exaggerated mouth movements. Later in the session, local Kailge signer Simon engaged him in a signed conversation about what Peter grows and what animals he has, which proceeded very well, despite Simon and Peter only having met previously in passing.

## **2.5 Sally**

Sally is around 15 years old. She lives in the Kubuka area in the lower Nebilyer Valley, about 15 minutes' walk from Kailge. She attended a recording session at John Onga's house in Kailge with her *tambu* (Tok Pisin, 'in-law') who gave consent on her behalf for participation. Sally appeared to have a cognitive impairment or developmental delay. She seemed to enjoy the session and smiled broadly throughout. Sally's *tambu* reported that Sally is the only deaf person in her lineage and that she does not socialise with any other deaf people. Sally lives with her father and helps with gardening work. Sally's *tambu* used sign to communicate with her, and Sally responded in mainly one-sign utterances. She did not use any speech.

## **2.6 Wendy**

Wendy is around 35 years old. She lives in Winjaka in the lower Kaugel Valley, which is on the other side of the Tambul Range from Kailge. She was born elsewhere in Western Highlands and married into Winjaka. She has five children (all hearing). She has one large pig and works growing her own food.

She has no deaf people in her lineage. Wendy is aware of the other two deaf women in the Winjaka area but has nothing in particular to do with them.

Wendy and I worked together over two days. For the first session, she attended with a hearing friend who did not sign but spoke Ku Waru to Wendy with exaggerated mouth movements. In this session, Wendy spoke some words in Ku Waru and signed others. For the second session, Wendy worked with me and John Onga, who used sign, and Wendy seemed comfortable using sign-only communication. I met two of Wendy's hearing children and very briefly observed them using sign with their mother.

## **2.7 Nina**

Nina is around 40 years old. She lives near Winjaka. She was born elsewhere in Western Highlands and married into Winjaka. There are no deaf people in her lineage. She is a widow and has eleven children (all hearing). Nina supports herself by making rope out of forest vines to tether pigs with, which she sells in Mount Hagen some five hours away by bus.

Nina worked with me for one session accompanied by her young daughter, who spoke to her mother in Ku Waru with exaggerated mouth movements. Nina was comfortable using sign with Wendy and John Onga, although she did not seem to have as large a sign repertoire as Wendy.

## **2.8 Lily**

Lily is around 30 years old. She is unmarried and lives with her father in Winjaka. She appeared to have cerebral palsy and a cognitive impairment. She attended the work session with her father who gave consent for her to participate. Lily appeared to be happy and comfortable during the session, but it was very difficult to elicit any language from her, and I ended the session early. It did seem that Lily's language was reliant on signs, not speech.

## **2.9 Sam**

Sam is from Waibip in the Nebilyer Valley, on the road between Kailge and Mount Hagen, approximately thirty minutes between both. He is around 25 years old. He recently married a hearing woman and moved to Mount Hagen. He attended with his father, a pastor. Sam has no other deaf people in his lineage. He worked with me at a guesthouse in Mount Hagen. He does not socialise with Anna (§4-2.10) and Roberta (§4-2.11), the other deaf people at Waibip. Sam preferred to speak rather than sign. His speech was difficult for me to understand, but his father understood him.

## **2.10 Anna**

Anna lives at Waibip in the Nebilyer Valley. She is around 25 years old. She is married to a hearing man and has one hearing child. She attended with her

hearing sister-in-law. She travelled to work with me at a guesthouse in Mount Hagen. She is the only deaf person in her lineage. Anna does not socialise with Sam and Roberta (§4-2.11), the other deaf people at Waibip. Anna's language is extremely speech dominant; she speaks fairly intelligible Ku Waru. Her sister-in-law communicated with her by repeating phrases and words in Ku Waru several times with exaggerated mouth movements. When encouraged to use sign rather than speech, Anna did show that she knew some of the most common signs in the area.

### **2.11 Roberta**

Roberta is around 15 years old and lives with her family at Waibip. Her father is a schoolteacher but Roberta has never attended school. Her mother describes her admiringly as a *hat meri* (Tok Pisin, 'strong woman') who works hard taking care of her younger siblings and growing food. She has six siblings, all of whom are hearing. Her parents report that all of her siblings sign well. I was very keen to work with Roberta and her family when I returned to the Highlands in November 2018, but unfortunately I could not locate them.

Roberta and her parents travelled to work with me at a guesthouse in Mount Hagen. Roberta gave me the impression that she is very quick and bright. Her father, Joseph, is quite thoughtful about his experience of having a deaf child and his impressions are included in §4-5. Joseph reports that Roberta signs with Sam and Anna, the other two deaf people who live at Waibip, but my



impression is that this is only in the normal course of movement around the community and does not comprise a special instance of deaf sociality. Joseph did report that for some time, Waibip had a visiting pastor from neighbouring Enga Province who had a deaf daughter Roberta's age, and they would sign together.

## **2.12 Delfina**

Delfina is around 18 years old and lives with her mother in Mount Hagen. She grew up near Tambul in the lower Kaugel Valley. She is Simon's niece (§4-2.1). Delfina is the only person we worked with who has a deaf family member; her older brother is deaf. However, according to her mother, while her son was born deaf, Delfina became deaf due to childhood illness. Perhaps 15 years ago, Kakuyl and Simon spent some time living at Delfina's mother's house with Delfina and presumably also with her deaf older brother.

Delfina and her mother travelled to Kailge to work with us, and we also met again in Mount Hagen later in the month for another session at a guesthouse. Delfina's mother used local ways of signing with her first deaf child. However, when Delfina was born, she obtained a copy of the Melanesian Sign Language book and used that system with her daughter.<sup>21</sup> There is no evidence of a family SL shared by Delfina and her brother.

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<sup>21</sup> "Melanesian Sign Language" is a reproduction of Australasian Signed English, a sign system imported into Papua New Guinea, with a handful of additions for local concepts such as

Delfina finished approximately Grade 8 at a mainstream school, although she found it very hard as there were no interpreters. She now works as a teacher's aide at a special school in Mount Hagen, supporting deaf children before they are sent to mainstream schools at approximately age 7. She is a competent user of PNGSL. In my experience she was quite resistant to local ways of signing, often refusing to use these, despite it being clear that she did understand at least some of what Kakuyul and Simon said when they signed to her using their local variety. I did see her using local ways of signing with Kakuyul. Delfina's preferred code is PNGSL and she responded to all stimulus materials in PNGSL.

### **2.13 Discussion**

In this section, I have described the sociodemographic situations of the 12 deaf people with whom I worked. The following conclusions arise:

- a. There is no evidence for hereditary deafness nor a high rate of deafness in this area. I worked with 12 deaf people out of approximately 13,000 total people in the study area. Even if we estimate that there are 100 times this many deaf people actually in the area, this constitutes 0.9%

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“betelnut” (cf. Department of Education, 2000). It has formed the basis for the lexicon of PNGSL. For more information on PNGSL, see Reed and Rumsey (in press), and for Signed English, Jeanes and Reynolds (1982), and Johnston and Schembri (2007, pp. 32-34).

of the population, which is below the threshold of a “normal” rate of profound-to-complete hearing impairment in the Asia-Pacific region (Stevens et al., 2013).<sup>22</sup>

- b. There is essentially no deaf sociality.
- c. While two deaf people currently live at Waibip and another three at Winjaka and surrounds, there is no evidence that these deaf people communicate more often with one another than any other unrelated people in a community would normally interact.
- d. With the exception of those at Waibip and Winjaka, most deaf people are the only deaf person in their community.
- e. In the one case where two deaf people were born into the same family, there is no evidence of a family SL.
- f. Each deaf person is at the centre of a network of sign users; this network may be large (in the cases of Kakuyl and possibly Roberta) or small (in the cases of Lily and Sally).

As described in Chapter 3, deaf community SLs are characterised by deaf sociality, community, and often education. It is clear from (b) and (c) above that Nebilyer/Kaugel SLs cannot be characterised as deaf community SLs. Given the defining feature of a village SL as a community with a high incidence of deafness, (a) and (d) confound the characterisation of signing in

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<sup>22</sup> Stevens et al. (2013, p. 149) estimate that in the Asia-Pacific region, 0.5% of males, 0.4% of females and 0.3% of children 5-14 years have either profound (80-94 dBHL) or complete ( $\geq 95$  dBHL) hearing loss = 1.2% of the population.

the study area as a village SL. In Chapter 3, I considered various other terms including rural SL and micro-community SL; however, as discussed there, the literature stipulates that a high incidence of deafness is a defining feature of these types. Hence, because of (a) and (d), Nebilyer/Kaugel SLs would not seem to fit these categories either. Where there may have been the possibility of a family SL for (e), this has not occurred.

Having excluded the major typological categories of deaf community SL and village SL, the remaining major category is homesign. As outlined in Chapter 3, the canonical homesign case is that of an ad-hoc variety generated by the deaf child, and not taken up by their interlocutors. Some Nebilyer/Kaugel SLs do partly fit the profile of canonical homesign, in that they are used by a single deaf child in an all-hearing family (Sally and Roberta). However, for Roberta, it appears that her family has taken up her language to a considerable degree, which is not the case for canonical homesign. Consider also the network of competent hearing signers surrounding Kakuyil. The fact that they have a high level of competency also challenges the characterisation of this language as homesign. We see that the diversity of the situations discussed here calls into question the potential usefulness of ‘rural home sign’ as an umbrella term (Nyst et al., 2012, p. 268).

It is unclear exactly how much contact deaf people need to have for a communal home sign situation to arise (Zeshan, 2011, p. 228). Communal home sign has not been established empirically, but rather is a hypothetical

type posited by Zeshan. Deaf individuals in Nebilyer/Kaugel appear “in sporadic and unsystematic contact with one another”, and so fit at least that criterion for communal home sign (Zeshan, 2011, p. 228). I return to this in Chapter 5.

If Nebilyer/Kaugel SLs are homesign languages and hence by definition have been individually generated, then we would expect their lexica: a) to be more different than similar to one another, and b) to have the same rates of similarity vs difference when compared to other sociodemographically similar SLs from elsewhere in PNG. There are two caveats to this. Similarity between varieties could result entirely from their grounding in shared lifeworlds, leading to the occurrence of independently invented iconic signs, or it could be driven by a repository of shared community gestures. I explore those questions in the next section.

### **3. Similarity and difference in sign lexica of Nebilyer/Kaugel**

#### **3.1. Theoretical background and methodology**

Using Microsoft PowerPoint, I created a pictorial Swadesh-style elicitation task based on Hou’s (2016) “Chatinolandia” task. This had 131 images, made up of photographs I took in the field and images taken from the internet; Figures 4-7 show some sample images. It was based on a list of basic vocabulary for SL lexical elicitation (Woodward, 1991) and a PNG-specific

wordlist (Z'graggen, 1980), with preference for concepts that were easily pictorially represented. For example, I discarded 'bad' and 'warm' from the Woodward list, as these are hard to represent pictorially.



Figure 4: Stimulus for COFFEE  
(photo: Lauren Reed, April 2018)



Figure 5: Stimulus for CASCAS (tree marsupial) (Villar, 2016)



Figure 6: Stimulus for DEAD  
(Dying clipart dead man, n.d.;  
Dead clipart dead guy, n.d.)



Figure 7: Stimulus for ONE-KINA  
(Yarosloff, n.d.)

A widespread approach to determining similarity *vs* difference between SLs is to collect wordlists and then compare sublexical, phonological parameters of signs (Kendon, 1988; Woodward, 1991, 1993b, 1993a, 1996, 2000; McKee & Kennedy, 2000; Guerra Currie, Meier, & Walters, 2002; Johnston, 2003; Al Fityani & Padden, 2010; Clark, 2017).<sup>23</sup> In many SLs of the world, signs differ in terms of contrastive parameters below the level of the word. The major contrastive features are handshape, location (of the sign in space or on the body) and movement pattern. Other researchers add orientation (of the hand or other articulator) and non-manual features, such as mouth actions, as contrastive features.<sup>24</sup> Just as the difference in voice onset time in [p<sup>h</sup>at] versus [bat] creates a minimal pair in English, a change in one phonological parameter can change the entire meaning of a sign.

Whether one expects to be able to compare phonological parameters or find evidence of phonological processes presupposes the existence of sublexical contrastive parameters in the SL in question. My finding is that generally, in

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<sup>23</sup> Woodward is the major proponent of lexicostatistical analysis for SLs. He states that he does not approve of parameter comparison to hypothesise relationships (Woodward, 2011, p. 4). Rather, he states that sign lexicostatisticians should consider two forms cognate if they can be connected through phonological processes such as assimilation, metathesis, and so on, as for spoken languages (Woodward, 2011, p. 5). Despite Woodward (1991, 1993a, 1993b, 1996, 2000) hypothesising many SL relationships based on “cognates”, from the papers I have read, I have been unable to find an example of how he comes to his conclusions; i.e., an example of how he considers a given sign pair cognate based on, say, assimilation.

<sup>24</sup> For overviews of sign language phonology, see Brentari (2011) and Fenlon, Cormier, and Brentari (2018).

Nebilyer/Kaugel SLs, there are none. I present two examples of how these SLs function without sublexical contrastive parameters. Signer Wendy produced the two iterations of MAN shown in Figures 8 and 9 within approximately 17 seconds of each other. We see here how even by the same user, in very close proximity, two tokens of the same sign differ in terms of the feature of handshape, in that one token is articulated with one finger and the other with the whole hand.



Figure 8: Wendy, MAN

(20180415\_Canon01\_001 2:33<sup>25</sup>)



Figure 9: Wendy, MAN

(20180415\_Canon01\_001 2:50)

<sup>25</sup> These references reflect my own metadata naming practices; they show first a filename (with date) and secondly a timestamp. My field materials will be archived with PARADISEC (Pacific and Regional Archive for Digital Sources in Endangered Cultures, [www.paradisec.org.au](http://www.paradisec.org.au)) over 2019. Upon archiving, the filenames will be changed to be PARADISEC-compliant, and a finder list will be included to connect the old and new filenames.



Similarly, four examples of Kakuyl's production of WOMAN from a single recording session show variation in parameters that are contrastive in other SLs (Figures 10-13.2). Table 1 shows the differing phonological parameters for each token:



Figure 10: Kakuyl, WOMAN  
(20180401\_Canon01\_002 2:45)



Figure 11: Kakuyl, WOMAN  
(20180401\_Canon01\_002 14:18)



Figure 12: Kakuyl, WOMAN (20180401\_Canon01\_002 11:28)



Figure 13.1

Figure 13.2

Kakuyl, WOMAN (20180401\_Canon01\_001 3:37)

Figure	Handshape	Location	Movement
10	Claw x 2	Over both 'breasts'	Placing on body
11	Claw x 1	Over left 'breast'	Placing on body
12	Flat x 2	Under both 'breasts'	Placing on body
13.1, 13.2	Cupped x 1	On right 'breast'	Tracing curve of 'breast'

Table 1: Differing phonological parameters for Kakuyl's production of WOMAN

Interviews with Kakuyl and other signers in his network reveal that any of these productions of WOMAN is considered correct. In addition, I never observed correction of a sign by any Nebilyer/Kaugel signer in terms of

standards of form.<sup>26</sup> It seems that the signing in this area does not exhibit phonological contrast below the level of the word. This accords with another young sign language, Al-Sayyid Bedouin Sign Language (ABSL) (Sandler, Aronoff, Meir, & Padden, 2011), where signers do not differentiate signs using sublexical phonological parameters alone.<sup>27</sup> In forms of signs with the same meaning, the high degree of variation by even individuals suggests that in Nebilyer/Kaugel SLs, lexical signs are best characterised as wholes with no strict internal structure. This is not to imply that every sign is a nonce creation, but rather as in ABSL, “signers are aiming for an iconic and holistic prototype, with details of formation taking a back seat” (Sandler et al., 2011, p. 517; also cf. Aronoff, 2007, p. 809). The reason for different choices of form is a question for another paper; it may have to do with speed of conversation (motivating one-handed versions) or with assimilation with the preceding or following sign. Most crucially, though, these examples reveal that signers are aiming for a holistic prototype, rather than a strict cluster of sublexical

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<sup>26</sup> Signers in this network *do* correct one another in terms of style. Style standards are that sign should not be articulated along with speech, it should not be too ‘jumpy’, and the manual articulatory space should not be too large.

<sup>27</sup> There is evidence, however, of “kernels of phonology” in some Nebilyer/Kaugel SLs (Sandler et al., 2011, p. 539). That is, the sign WOMAN in Figures 10-13.2 may have variable handshapes and locations, but what these both have in common is a) all five fingers selected and b) located in the breast area. Two signs which commonly recur in Nebilyer/Kaugel SLs are WORK-GARDEN and CUT-BUSH, which form a minimal pair, being identical in all parameters except handshape. WORK-GARDEN has a fist hand that ‘chops’ across the body (see Figure 18) and CUT-BUSH a flat hand. Nevertheless, these “kernels” are not robust enough to be able to use form as the basis for determining the extent to which sign lexica are similar or different.

parameters. Therefore, using sublexical contrastive parameters to determine similarity vs difference in sign varieties in this area is not a viable approach.

If we do not use form to determine sign similarity or difference, what remains? I have already discussed the common set of features bundled sublexically into many signs, the major three being handshape, location and movement. Kendon (1980b) used a different tripartite distinction to examine signs, based on Mandel (1977). Namely, the *referent* is the meaning a sign has “in a given context of use”, and the *base* is “the object or action that the production of the sign is derived from” (Kendon, 1980b, p. 83). The third aspect of “how a sign is made” I refer to as the *form*, following Green (2014, p. 89). As discussed, in Nebilyer/Kaugel, there is too much intra-signer variation in form to be able to use this as a measure of whether SLs are more similar or more different. Hence, once we establish two signers are intending for a sign to have the same referent (for example, they both produce a sign to refer to pigs), what we can compare is whether those signs have the same *base*.

The notion of base rests on the fact that a sign is iconic; that is, that there is a motivated relationship between form and meaning. If there is no such relationship (i.e., if the sign is arbitrary), then there is no base; there is no “object or action that the production of the sign is derived from” (Kendon, 1980b, p. 83). Every sign that I encountered in Nebilyer/Kaugel has a

motivated form-meaning relationship; hence, every sign is iconic.<sup>28</sup> This is what makes same vs different base a universally applicable criterion for all the SLs in my study area.

How different can bases be? In fact, iconic signs carry a measure of arbitrariness. Planer and Kalkman (2019) identify what they call *alternative arbitrariness* as a measure of how arbitrary a signal is. A highly arbitrary signal is one where there are many alternatives for how that signal might have been articulated; for example, the word “‘dog’ is a highly arbitrary signal in the sense that there is a huge number of other acoustical patterns that English speakers might have used to mean DOG” (Planer & Kalkman, 2019, p. 8). Consider, now, the following three iconic signs for PIG in various SL lexica of PNG (Figures 14-16). The bases are, respectively, the rooting of a pig, its tusks, and the typical way of tethering pigs around the foreleg as practised in Highlands regions of PNG (Figure 17). Many other bases could be used, such as a pig’s curly tail, its protruding snout, or its salient nostrils. Even though all these PIG signs are iconic, there is still a degree of arbitrariness in terms of which characteristic of a pig a signer uses as the base of their PIG sign.

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<sup>28</sup> Some signs in Kakuyl’s SL have undergone phonological reduction so that the iconic base is somewhat obscured, but this is still evident in slow productions of the signs or with explanation from signers; see Appendix C for an example, SLEEP, and also Reed (2019c) for HOUSE (available at <https://vimeo.com/344214788>).



Figure 14.1

Figure 14.2

PIG, signer from Western Province, PNG (20181108\_Sony\_027 5:11)



Figure 15: PIG, signer from Eastern Highlands Province, PNG (20181111\_Sony\_046 00:35)



Figure 16: PIG, signer from Western Highlands Province, PNG (20180415\_Sony\_001 1:03)



Figure 17: Tethered pigs at Kailge (photo: Lauren Reed, November 2018)

Hence, even iconic signs have a measure of arbitrariness, in that signers have a range of bases to select from. Therefore, in the following analysis, I select *sign base* as the criterion for whether two signs are the same or whether they are different. Base is the same as Richie, Fanghella, & Coppola's (2012, p. 5) and Richie, Yang, & Coppola's (2014, p. 186) “conceptual component”, or “aspect of the item’s meaning that the gesture iconically represented”. My method is somewhat similar to Hou’s (2016) comparison of family SLs in San Juan Quiahije, Mexico. Hou first sorted signs according to which iconic strategy they made use of; for example, whether the base was a referent’s characteristic facial attribute or characteristic body action (p. 170). If two signs with different bases were of the same category (such as a goat’s beard and a goat’s horns both representing a characteristic facial attribute), then Hou assigned them different codes (p. 155). This second stage is essentially my method. Hou was interested in looking at what iconic strategies signers in San Juan Quiahije preferred (pp. 152-154), while I am concerned with analysing how similar or different the lexica of Nebilyer/Kaugel SLs are. Hence, Hou’s first step of sorting signs by iconic strategy is not relevant to my current analysis.

I have established the analytical framework with which to compare my wordlist data, but challenges exist. Firstly, it was not always possible to get a ‘cleanly’ elicited token for each word on the list. This was due to a tendency of signers to respond with a descriptive paraphrase or anecdote regarding the stimulus. This same tendency was reported by Hou (2016, pp. 149-150) in rural



Mexico and Horton (in press, pp. 21-23) in Guatemala. For example, Lewis responded to the stimulus for SWEET-POTATO with the following signs:



Figure 18: Lewis, WORK-GARDEN (20180405\_Canon01\_008 17:40)



Figure 19.1



Figure 19.2

Lewis, SWEET-POTATO (20180405\_Canon01\_008 17:40)



Figure 20: Lewis, SATISFYING (?) (20180405\_Canon01\_008 17:40)

In this case, the first sign (Figure 18) is a widely-occurring sign in SLs in Nebilyer/Kaugel that consistently denotes WORK-GARDEN. The second (Figures 19.1 and 19.2) is, again, a very widespread sign in all the SLs I worked with for SWEET-POTATO (the base is the customary snapping of a roasted sweet potato to cool and eat it). The third sign (Figure 20) I took to be a sign demonstrating the stomach-filling quality of sweet potatoes.

In my experience, trying to persist with consultants to get a (possibly hypothetical) ‘single correct sign’ made people confused and uncomfortable, and it was best to move forward. In the example above, given the fact that the locally commonly-recurring SWEET-POTATO sign occurred in this response to the ‘sweet potato’ stimulus, I take this to mean that this is Lewis’ sign for sweet potato. I applied this same logic throughout the wordlist analysis; that is, if a standalone sign I had previously identified occurred in a string of signs, I took the locally commonly-recurring sign as the signer’s sign. In addition,

where possible, I found single signs in separate narrative or conversational stretches with the same signer, and then considered that ‘their sign’. As such, I have not only used a wordlist to generate my analysis, but have used corpus data of naturalistic conversation where it was available.

Another analytical challenge is that wordlists can occlude the fact that signers know and use more than one sign for a given concept (Palfreyman, 2015, p. 41). For the most part, the signers I worked with used one sign for a referent throughout a session. Occasionally, though, they used different ones. I chose the sign they used the most consistently as ‘their sign’. For example, talking with me, the first sign Wendy naturally produced for PIG was a head-thrust forward combined with a bilabial trill (Figure 21). John Onga instantly interpreted this as PIG, and responded to it with a common sign for PIG, a grasping of the wrist (Figure 22). Wendy smiled and nodded (Figure 23) and repeated this tethered sign for PIG, directing it to me (Figure 24).



Figure 21: Wendy produces a rooting PIG sign to Lauren (20180414\_Canon01\_003 17:18:00)



Figure 22: John produces a tethered PIG sign to Wendy (20180414\_Canon01\_003 17:22:00)



Figure 23: Wendy looks at John and smiles (20180414\_Canon01\_003 17:22:30)



Figure 24: Wendy produces a tethered PIG sign to Lauren (20180414\_Canon01\_003 17:23)

Was Wendy's rooting PIG sign an ad-hoc descriptive strategy for my benefit – an outsider whom Wendy assumed would not be able to understand the base of the common tethered PIG sign? Did Wendy know the tethered PIG sign before

being shown it by John? I argue that she did, based on her positive response to it and her very quick reproduction of it to me. In addition, for the rest of the two sessions we worked together, I never saw Wendy use a rooting PIG sign again, only the tethered PIG sign. On that basis I entered the tethered PIG sign as Wendy's for this analysis.

Out of the 131 stimulus items, I chose the responses to 66 for analysis. The stimuli I excluded either failed to get a consistent response among signers because the picture was unclear (e.g., some people thought a packet of milk powder was a packet of washing powder) or consistently elicited descriptive paraphrases from signers, leading me to assume there was likely no standalone lexical sign for this concept across several user inventories (this was the case for 'flower', 'feather' and 'mud', among others).

Out of the twelve signers I worked with, I chose five signers for this analysis. One signer (Delfina, §4-2.12) responded to the wordlist in PNGSL. As mentioned in Footnote 5, PNGSL has developed out of an imported Australasian sign system and as a result, many PNGSL signs are non-iconic. As a result, it is not possible to consider their bases, so I do not include Delfina's responses. The remaining six signers did not respond to over half of the 66 stimulus items, leading me to feel that comparative results would not be sufficiently significant. Their failure to respond may have been because they did not know signs for the items on the wordlist, or because they did not understand the task. It is not a given that deaf people will use sign as their

primary mode of communication. Indeed, Anna (§4-2.9) and Sam (§4-2.10) preferred to speak rather than sign. Peter (§4-2.4) spoke Ku Waru words in response to the wordlist task but clearly understood much (if not all) of Simon's (§4-2.1) signing, which featured many commonly recurring local signs.

For broader comparative purposes, the results from the five Nebilyer/Kaugel signers are contrasted with the results of the same task that I administered to signers in Moresby in October 2018. The first signer, Johnny, is originally from a village in Gulf Province, some 250 km away (as the crow flies) from Kailge in Western Highlands. He was a user of a local SL until he came to the capital at around age 18 and began to acquire PNGSL. He is now around 30. Gulf Province is quite different culturally to the Highlands; for example, coconuts are an important foodstuff and pigs are hunted, not tended. The second signer, Rodney, is originally from a community near Mendi in Southern Highlands Province, some 100 km by road from Kailge in Western Highlands. Rodney was a user of a local SL until he came to Moresby at 10 and acquired PNGSL. He is now 18. Unlike Gulf Province, Southern Highlands Province is very similar culturally to Western Highlands Province, with similar reliance on sweet potato, coffee cash cropping, and pig farming. (See Map 2 for the locations of Gulf and Southern Highlands Provinces, and Moresby.)

Before presenting the results, I summarise my analytical decisions:

- a. Signers who responded in a local SL to 50% or more of the 66 wordlist items were included.
- b. When a signer produced a descriptive paraphrase in response to a stimulus, if I identified a sign that other signers commonly use for that referent within that paraphrase, or if I found a single sign for the referent elsewhere in the session, I considered that single sign that signer's sign.
- c. If a signer produced two or more signs in a session for a given referent, I include the most regularly used sign in the session as that signer's sign.
- d. Determination of bases is based on my construal of the base of the sign. When uncertain, I asked consultants. It may be that the bases of two signs appear similar but are actually different in the minds of consultants. For example, the sign BIRD is usually a flapping of the arms, for which the base could be arguably either a) the bird's wings or b) the bird's flight. These are close enough, however, for me to argue that they are the same base (versus, say, a sign which took as the base a bird's beak).
- e. If the base was the same for two signs but their forms were significantly different, I considered the two signs different. For example, Lewis, Wendy, Roberta and Johnny's signs for TWO-KINA took as their base the numeral two. However, the form of



Roberta's sign was tracing the number two in the air, while the form of Johnny, Lewis and Wendy's signs was holding up two fingers. I coded Johnny, Lewis and Wendy's signs as the same, given that they used the same base and the same form. Although Roberta's base was also the numeral two, I coded this as different, as it had an entirely different form to the former three signers.

## **4.2 Results**

The results of comparison of lexica by base are displayed in Table 2. The percentage denotes how many signs with the same base that signers shared. Not all signers responded to all 66 stimulus items; the proportion of stimuli they shared that they responded to is given in brackets. A sample of my coding is included in Appendix D.

	<b>Kakuyl</b> <b>(N/K)</b>	<b>Tony</b> <b>(N/K)</b>	<b>Lewis</b> <b>(N/K)</b>	<b>Wendy</b> <b>(N/K)</b>	<b>Roberta</b> <b>(N/K)</b>	<b>Johnny</b> <b>(Gulf)</b>
<b>Tony</b> <b>(N/K)*</b>	79% (49/62)					
<b>Lewis</b> <b>(N/K)</b>	67% (44/66)	76% (47/62)				
<b>Wendy</b> <b>(N/K)</b>	65% (36/55)	66% (35/53)	65% (36/55)			
<b>Roberta</b> <b>(N/K)</b>	61% (38/62)	71% (42/59)	66% (41/62)	57% (30/53)		
<b>Johnny</b> <b>(Gulf)</b>	36% (21/58)	45% (25/56)	52% (30/58)	41% (20/49)	45% (25/56)	
<b>Rodney</b> <b>(S Highlands)</b>	39% (23/59)	40% (23/57)	47% (28/59)	38% (19/50)	36% (20/56)	59% (33/56)

Table 2: Lexical similarity of Nebilyer/Kaugel SLs by sign base comparison (N/K denotes Nebilyer/Kaugel)

We see that signers in Nebilyer/Kaugel exhibit base consistency rates of between 61% and 79%. Recall that many of these signers have never met, such as Kakuyl and Wendy, who live on opposite sides of the Tambul Range. The two signers living in Moresby exhibit 36% to 52% base consistency with any given Nebilyer/Kaugel signer. Note, interestingly, Johnny and Rodney sharing 59% base consistency, despite them hailing from different places. Beyond the scope of this thesis is how signers in Moresby may be converging on particular

signs, to create one Moresby variety (cf. Horton, in press, on homesign in a peer ecology).

I conducted a permutation test to see whether or not the Nebilyer/Kaugel group has a higher rate of base consistency than any other combination of signers in the study group. I calculated the average base consistency across different combinations of 5 out of 7 signers, as my hypothesis is that the group of five Nebilyer/Kaugel signers are significantly more similar than any other combination of five signers. There are 21 possible combinations of 5 signers out of 7. I generated these combinations with a manual algorithm, and then averaged the base consistency rates of each set of 5 signers (from Table 2). The results are presented in Figure 25.

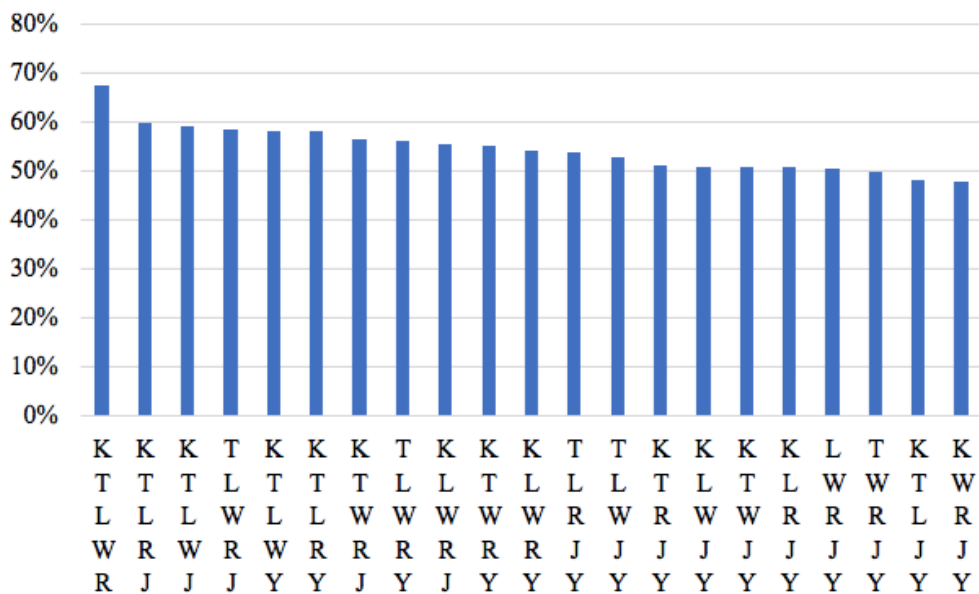


Figure 25: Permutation test for shared signs in Nebilyer/Kaugel (K = Kakuy, T = Tony, L = Lewis, W = Wendy, R = Roberta, J = Johnny, Y = Rodney)

We see that the group of five Nebilyer/Kaugel signers exhibit greater base consistency than any other combination of five signers (67%, compared to 48%-60% for all other groups of five). The possibility of this combination having the highest consistency among all combinations via chance is 1/21, which is less than 5%, an accepted cut-off for statistical significance (Diamond & Jefferies, 2011, p. 141). Hence, the level of base consistency between Nebilyer/Kaugel signers as opposed to any other grouping of five signers is statistically significant at the 5% level.<sup>29</sup>

While I have not considered form in this analysis, it is striking that where a base is the same, the form tends to be very similar. For example, in Nebilyer/Kaugel, a common base for the sign SICK is shivering. This could be expressed by hands hugging the body and shivering, hands flat on the sides of the body and shivering, or grimacing and shivering. However, across the five Nebilyer/Kaugel signers, it is expressed with a form where the fists are held at around chest height and shaken, pantomiming shivering. The challenges with considering form notwithstanding, it may be that if both form and base were considered, we would find an even higher degree of similarity among signs in Nebilyer/Kaugel.

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<sup>29</sup> I am indebted to Mark Ellison and Steve Haslett for assistance with this part of my analysis. Any errors, of course, are mine.

### 4.3 Discussion

If all seven SLs considered in Figure 25 were the results of independent invention, then we would expect to see roughly identical levels of similarity or difference among all them.<sup>30</sup> However, we see that the SLs from the Nebilyer/Kaugel study area cluster together in terms of similarity, while the two SLs from outside the area are more disparate in terms of similarity to these five SLs. In other words, SLs in Nebilyer/Kaugel are more similar to one another than to SLs from further afield.

How could this be the case given that there is very little association between deaf people in this area? It could be argued that the shared lifeworlds of signers in Nebilyer/Kaugel have led to independent recruitment of the same bases. For example, Johnny's sign for PIG takes as its base the aggressive charging of a pig, which is unsurprising given that in his coastal home province, pigs are hunted, not farmed as in the Highlands. However, although Rodney's home community is in the same Highlands cultural zone as Nebilyer/Kaugel, his signs also pattern at lower levels of base consistency when compared with Nebilyer/Kaugel signers (including his sign for PIG, which is based on the pig's ears and snout, not on tethering). There is still ample opportunity for

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<sup>30</sup> Some signs which are shared across all seven individual SLs *are* good candidates for independent invention. KEY is one of these, and indeed, every sign for KEY in 26 sign languages on 'Spreadthesign', a website which shows signs from many deaf community SLs, has the same base as all seven PNG SLs surveyed here; namely, the act of turning a key in the lock (<https://www.spreadthesign.com/en.us/word/8374/key/0/?q=key>, accessed 17 May 2019).

alternative arbitrariness (Planer & Kalkman, 2019) to be at play in Nebilyer/Kaugel, but signs regularly have the same base across the five SLs. That is, FIRE could take as its base the striking of a match, the pushing-together of sticks, the warmth of the flames and so on, but in every individual SL, Nebilyer/Kaugel signers select the same base (in this case, the blowing-on of embers).

Another possibility is that a repertoire of majority community gestures has fed into Nebilyer/Kaugel SLs and is the reason for their lexical consistency. This is reported for signs in San Juan Quiahije in Mexico (Hou, 2016, p. 140; Hou, 2018, pp. 577, 580) and signs in Yucatec Maya communities (Safar, 2017, pp. 15-16). Some cultures have significant inventories of conventional gestures used by hearing people, such as the Mofu-Gudur of Cameroon, with some 1500 gestures (Sorin-Barreteau, 1996, as cited in Nyst, 2010, p. 417). While some mainstream community gestures in Nebilyer/Kaugel have entered local SLs (e.g., a negative hand gesture and a finger-counting system), there is no large repository of gestures in this area that can explain sign consistency in Nebilyer/Kaugel. This is based on discussions with hearing signers, and my own observations and those of Rumsey and Merlan, which are grounded in 38 years of fieldwork in the region. In addition, unlike in parts of Indigenous Australia (Kendon, 1988), there is no alternate SL in this region (see p. 14 of this thesis) which could explain lexical consistency among SLs.

We have, therefore, eliminated gesture as a driver of lexical consistency across the area. Through discussion of alternative arbitrariness for iconic signs and by comparison with signs from a signer from a similar Highlands cultural area, we have eliminated independent invention as another driver of lexical consistency. Therefore, Nebilyer/Kaugel SLs do not fit well with the canonical homesign model, where they would all be considered ad-hoc inventions. They have a degree of connectedness in terms of lexical similarity, which is uncharacteristic of canonical homesign. I propose that the degree of lexical consistency in Nebilyer/Kaugel SLs suggests that there has been diffusion of signs between signers, and that hence, the languages are not isolated but connected. We have seen that on sociodemographic grounds (§4-3) there is little evidence for inferring that deaf people could be the vectors of this diffusion, as there is very little contact among them. Let us now consider emic perspectives on signing and see if they give us clues firstly as to where Nebilyer/Kaugel SLs fit in the SL taxonomy, and also as to whether sign diffusion is a reasonable hypothesis.

#### **4. Emic perspectives on sign language**

When hearing people discuss signing in Nebilyer/Kaugel, they usually refer to it as *aksen*. This is a Tok Pisin word also used to talk about dancing, or waving one's hands at a Pentecostal church service. At the end of my four-week trip in April 2018, Muna, Kakuyl's wife, remarked that I had learned well *aksen blong en* (literally, "his aksen"). It is noticeable here that Muna did not refer to *aksen* as a standalone, objective entity like Ku Waru, Tok Pisin, or Auslan.

Rather, what I had successfully learned was *his* aksen, Kakuyl's aksen – his language, not 'the' language. Similarly, at the end of a recording session where he had been signing with Peter, Simon remarked: “*Tupela kumsiyl, tupela tok ples*” (Ku Waru/Tok Pisin, ‘two deaf people, two languages’). Both these examples suggest that some (hearing) signers conceive of each SL as a discrete entity.

Compare this to the following exchange relating to Kakuyl having watched two videos supplied by linguist Samantha Rarrick of signers in the Sinasina Valley in nearby Chimbu Province, some 100 km away and in the same Highlands cultural zone (cf. Rarrick & Asonye, 2017; Rarrick, 2017, 2018, 2019). The first video featured a deaf man with a damaged eye who used several signs which commonly recur in Nebilyer/Kaugel.<sup>31</sup> The second video featured a deaf man whose communicative mode was, by my assessment, speech rather than sign dominant. Kakuyl responded with the following assessment of the two signers, which I translate here (the full signed sequence can be seen in Appendix E):

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<sup>31</sup> This warrants investigation; that is, how this lexical consistency has occurred across such a wide distance. I look forward to investigating this in future collaborative work.



*That [second] guy is one thing. The guy with the eye, he's another thing. He and I are the same. That's it! That [second] guy talks and signs wildly. It's no good/I don't get it... The guy with the eye is good. He and I are one and the same. It's good.*

(Kakuyl, 20180331\_Canon02\_007 11:19-12:04)

Kakuyl's first point accords with Simon's assessment above that some SLs are very different from each other. However, Kakuyl's second point is that other SLs are very *similar* to each other. Not all SLs are discrete, individual entities.

Now consider the following exchanges with John Onga, a hearing signer from Kailge, who had just watched the same video of signers from Sinasina:

Line	Speaker	Utterance
1	John Onga	People [who] live around near Kakuyl, they will catch up quick, but like people living around at Kailge area, they won't. They can't.
2	Alan Rumsey	So they learn from him.
3	John	They learn from him.
4	Alan	But where did he learn? That's what we want to know.
5	John	He learned from, I think, from his father and mother.
6	Alan	How did they learn? They were not deaf, so – how did they –
7	John	They – because he was a deaf [sic]. They were trying

		to teach him. You go, come [gestures] – by using the hands.
8	Simon Kaiya	(Ku Waru) [unclear]
9	John	Some, you see, small boys, they can teach him, you see. And now we learn from Kakuyl some. <i>Na</i> [Ku Waru, 'I'] – I learn from Kakuyl and [Lewis]. Because I usually go around with the deafs [sic].
10	Alan	So what we want to know is how people all the way over in Sinasina learned the same way.
11	John	Yeah, I know.
12	Alan	They learned the same way, even though...
13	John	One is yes, but the other twos –
14	Alan	One is the same, so how did that fellow learn the same way as –
15	John	[incredulous] No, by himself, you see!
	(Discussion between Lauren and Alan)	
16	John	One thing you see. Drinking water is easy [signs]. You see, <i>em</i> [Tok Pisin, 'this']. Fire [signs] – can catch up easily. This one. Making drains – <i>em</i> [signs]. It's easy.

Table 3: Discussion between John Onga and Alan Rumsey (20180401\_Canon01\_002

6:48-8:39)

John's impression is that a SL is a creation of a deaf person (line 15), but also taught to the deaf person by his/her parents and entourage (lines 5, 7, 9). In addition, sign is learned via association with deaf people (lines 1-3, 9). Now consider this exchange with Joseph, the father of Roberta, who is deaf:

Line	Speaker	Utterance
1	Lauren Reed	Joseph, how did you learn to do <i>aksens</i> ? Did you know somebody deaf when you were young?
2	Joseph	Okay. Then, um – learning this one, by the time when [Roberta] came into my family, now I have to speak to her in this –
3	Alan Rumsey	So how did you learn it before she came into your family?
4	Joseph	Before – before I didn't know anything. When they were doing <i>aksens</i> , I didn't even –
5	Lauren	Understand
6	Joseph	Understand. But <i>wan, olsem, wan wan</i> [Tok Pisin, 'one, like this, bit by bit'] at times, when I was going around with some deaf people, I saw them. I saw the <i>aksens</i> . But – and then when [Roberta] came, I have to do something [see Figures 26.1, 26.2] in order to – in order for her to understand.
7	Alan	So who were those deaf people that you –
8	Joseph	Some of my friends at home. Like, uh [to sister] –

		some boys from our neighbouring tribes. Some – yeah, some boys.
9	Lauren	Who were deaf.
10	Joseph	Who were deaf.
11	Lauren	Are they still alive, or?
12	Joseph	Yeah, they are still alive. [Discussion with sister about name of one deaf man]
13	Lauren	And which tribe is that?
14	Joseph	He’s from the Ulka tribe.

Table 4: Discussion between Joseph, Lauren Reed and Alan Rumsey

(20180416\_Canon01\_012 00:25-1:44)



Figure 26.1



Figure 26.2

Joseph makes a ‘signing’ gesture as he says, “I have to do something...in order for [Roberta] to understand” (20180416\_Canon01\_012 1:04-1:08)

While Joseph does not say that he learned signing from deaf boys in his community growing up, it is clear is that he gained a passive awareness of it (lines 4, 6, 8). Although it is not entirely clear how he went on to learn signing,

it is clear that association with deaf people is a key factor in people being able to use sign.

We also gain a sense from Joseph how sign diffusion may occur. He is from the Ulka tribe whose lands are some 2 km east of Waibip and 6 km east from Kailge. There is a deaf man still living at Ulka, whom Joseph likely still associates with at least peripherally, given the discussion in lines 8-14 and also because of living patterns in the Highlands, where people maintain a strong connection to their birth community. Kakuyl's sister, Dawn, who is reported to be a good hearing signer, now lives in the Ulka community. Kakuyl is aware of a deaf man living in the Ulka community, and it is likely that this deaf man is one of the deaf men Joseph knows. We begin to see how deaf and hearing people in this region are members of overlapping social networks, which may provide conduits for sign diffusion. I return to this in the next chapter.

Summarising this section, emic perspectives allow us to draw following conclusions:

- a. Some people conceive of SLs as individual creations
- b. Some people see strong similarities between SLs
- c. Some people understand that SL is taught to a deaf person by family and friends
- d. Socialisation with deaf people is a key factor in both active acquisition and passive awareness of sign.

Point (a) accords with the core feature of canonical homesign, but points (b) and (c) do not. Point (a) does not fit with the finding in §4-4 that Nebilyer/Kaugel SLs have a high degree of lexical consistency that cannot be attributed to independent invention or mainstream gesture. Point (d) does not accord with typical characterisations of homesigners as “isolated” (Frishberg, 1987, p. 128; Osugi et al., 1999, p. 102) in that deaf people are described as part of the social fabric of Nebilyer/Kaugel life. I now move to a penultimate chapter where I synthesise my findings so far.

**CHAPTER FIVE:**  
**SIGN NETWORKS, NUCLEATED NETWORK SIGN**  
**LANGUAGES, AND THE REGIONAL SIGN NETWORK**

In Chapter 4, I used sociodemographic data, sign base comparison, and emic perspectives to conclude that Nebilyer/Kaugel SLs cannot be characterised as deaf community or village SLs. This leaves homesign as the remaining major taxonomic category. However, I also showed that Nebilyer/Kaugel SLs differ from canonical homesign in several ways. One is that some varieties (such as Kakuyi's, §4-2.1) are not used by an "isolated" deaf person (Frishberg, 1987, p. 128) but rather by a network of fluent hearing signers both related and unrelated to the deaf person. In addition, the degree of lexical consistency across Nebilyer/Kaugel SLs suggests that these languages have not been independently invented. I excluded shared lifeworlds and majority community gesture as sufficient to account for the degree of lexical consistency among the SLs<sup>32</sup>, and suggested that diffusion must be a significant factor. Finally, I considered emic perspectives, which provide further evidence for sign diffusion across the area.

In this chapter, I introduce some new concepts which I believe are necessary to accurately describe Nebilyer/Kaugel SLs and their lexical consistency. I

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<sup>32</sup> I agree with an examiner that these assumptions stand in need of further support. In future fieldwork, I plan to record and analyse gesture in Nebilyer/Kaugel, so as to be able to reinforce or rethink my conclusions here.

propose the concept of a *sign network*, which is a kind of social network characterised by sign use. I next present the category of *nucleated network sign language*, which is a SL with a unique set of sociodemographic features not captured by any category in the existing taxonomy. Finally, I offer the notion of a *regional sign network*, which connects sign users across the region via a web of what social-network analysts have referred to as “weak ties” (Granovetter, 1973), to be defined below. These ties account for lexical consistency among local SLs; it is via weak ties that signs are diffused. In Nebilyer/Kaugel, there are vastly more hearing sign users than deaf sign users, and there is very little deaf sociality. Therefore, hearing people constitute the majority of weak ties between SLs, and are a critical factor in the regional sign network.

### **1. Sign networks**

A network is a collection of individual elements that are linked or connected. These elements are known as points, vertices or *nodes*, while the connections between them are edges or *ties* (Granovetter, 1973; Newman, 2010, p. 1; Scott, 2013, p. 84). One particular type of network – the kind we are concerned with here – is a *social network*, in which the nodes are people and the ties are some form of social interaction (Barnes, 1954, p. 43; Milroy, 1980; Newman, 2010, p. 36). I define a *sign network* as a social network in which the nodes are people, and the ties are signed communication. These *sign ties* may be strong or weak. In social networks more generally, tie strength can be understood as a



combination of how much time individuals at nodes spend together, the intensity of their emotional and intimate connections, and the extent of “reciprocal services” between individuals (Granovetter, 1973, p. 1361). In a sign network, I define a strong sign tie as one in which individuals: a) spend much regular time using sign to communicate, and where b) that signed communication is characterised by mutual fluency. In order for a sign tie to be strong, there must be roughly equivalent levels of sign competency at both nodes. I define a weak sign tie as simply one which is not strong, i.e., one in which individuals do communicate in sign, but where this is a) infrequent or b) where the sign competencies at either end of the tie differ substantially.

## **2. Nucleated network sign languages**

In §3-3, I presented five cases which do not fit well into the canonical homesign mould, namely those of Billy, Kagobai, Mohan, Bakaye, and Mme Pettikwi. All these cases are characterised by a lack of regular contact by the deaf signer with other deaf people, whether by chance (Kagobai, the only deaf person on the island) or by choice (Mohan, who lives in the same village as another deaf man, but they have no contact). I do note that Bakaye visits his deaf cousin, but it seems that his main interlocutor is not that deaf cousin but rather the hearing people surrounding him, in his situation as the only deaf person in his community (Nyst et al., 2012, p. 264).

One Nebilyer/Kaugel SL in particular stands out for its similarity to these cases. Like Bakaye, Kagobai, Billy and Mme Pettikwi, Kakuyl is the only deaf individual in his community and has limited contact with other deaf people living nearby. However, Kakuyl is surrounded by a network of fluent hearing signers with whom he communicates regularly. Not all are related to him; recall from §4-2.1 that four are his close childhood friends. Canonical homesign is understood as being generated by the deaf person and as having limited uptake by hearing interactants. In contrast, Kakuyl's variety appears to be as much the creation of his hearing interlocutors as his own. Recall Jepson's (1991b) parallel observation here regarding Mohan's SL, that "the language was probably invented not by Mohan alone, but also by his parents and other family members" (p. 57).

Focusing primarily on interactions between deaf people can be misleading. Indeed, Nyst and colleagues noted in regard to deaf people in rural Mali that:

*Interestingly, the variation in fluency in Douentza is not due per se to the number of deaf people in a given community, or even in a given family... In other words, being the sole deaf person in a village does not mean one cannot become a fluent signer, and being a deaf child of a deaf adult does not mean one automatically acquires fluent signing skills.*

(Nyst et al., 2012, p. 267)

In order to unravel this seeming conundrum, the focus should not only be on deaf people's interactions with other deaf people. Rather, we must look at how much fluent and regular signed interaction there is, whether the deaf person is interacting with a deaf person or a hearing person. That is, we need to consider a deaf person's sign network and the degree to which they have strong sign ties with any individual, deaf or hearing.

Let us consider here canonical homesign languages in the light of sign networks. The language of the homesigners Goldin-Meadow (2003) worked with had internal consistency, yet the systematicity and complexity of their languages were not taken up by their mothers (pp. 153-161). In the case of the homesigner David, it was also not taken up by his sister (Goldin-Meadow, 2003, pp. 91, 149). David's signed communication with his mother and sister was presumably frequent, but was not characterised by mutual fluency and comprehension. I would describe his sign network then as being characterised by only weak sign ties (Figure 27):

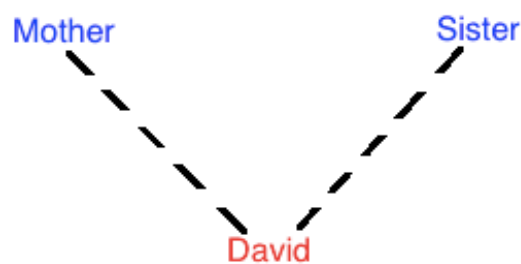


Figure 27: David's sign network (red denotes deaf; blue denotes hearing; dotted line denotes weak sign tie)

Compare, now, Kakuyl's sign network. Like David's sign network, this is characterised by one central deaf individual. However, Kakuyl's sign network is characterised by both weak and strong sign ties. Weak sign ties exist between Kakuyl and those in his larger social networks of clan and tribe, including John Onga and John's wife Wapi, and also with Lewis and Tony, the local deaf men Kakuyl knows but does not socialise with. However, unlike in David's case, strong sign ties exist between Kakuyl and other people. These people are of four sorts: friends (Win, Nikindi, Simon and Thomas), siblings (Sap, Dawn and Cedric), parents, and partner (Muna) and children. These ties are characterised by regular signed interaction and competency, fluency, and mutually equivalent command of the language.<sup>33,34</sup> There are of course other social ties within this network, such as the sibling tie between Sap and Dawn, Sap and Cedric and so on. However, there are no sign ties linking hearing nodes. Hearing people in the network do not sign together unless Kakuyl is present, and therefore he functions as the 'bridge' between them, even in the

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<sup>33</sup> In Chapter 4, I compared sign similarity between different SLs. An important contrast is the degree to which signs are shared within a single SL. I have recorded wordlists from signers within Kakuyl's sign network and also spent much time working with these signers. While this data is yet unanalysed formally, I can attest with confidence that within this sign network and its associated language, there is a stable lexicon with a very high degree of shared signs.

<sup>34</sup> It is debatable whether Kakuyl's children should be classed as having strong sign ties to him, as they are still learning the SL and do not have equivalent command of the language compared to their father. Nevertheless, given their competency I have seen so far and the degree of daily interaction with their father, I think it reasonable to class them as strongly tied, with allowance made for their young age.

moment of conversation. Hearing-hearing signing without Kakuyl present only exists in very rare instances, such as to prevent overhearing.

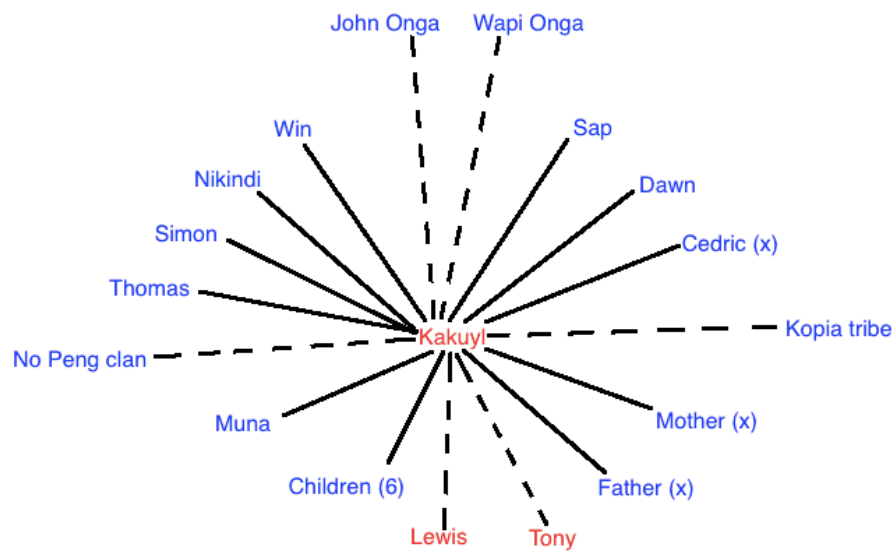


Figure 28: Kakuyl's sign network (red denotes deaf; blue denotes hearing; (x) denotes deceased; solid line denotes strong sign tie; dotted line denotes weak sign tie)

Based on these considerations, I propose that we need a new taxonomic class to capture the type of SL used by Billy, Kagobai, Mohan, Bakaye, Mme Pettikwi and Kakuyl. I propose that this be termed a *nucleated network sign language*.<sup>35</sup> This has the following canonical features:

- a. It is typically characterised by one deaf person who is not in regular contact with other deaf people, but who is at the centre or nucleus of a

<sup>35</sup> This term was proposed by Alan Rumsey.

network of adept hearing signers with strong sign ties to the deaf person.

- b. The nucleated sign network includes not only strong sign ties, but also weak ones to less regular or less fluent signed interlocuters.
- c. The network of hearing signers surrounding the deaf individual typically includes individuals both related and unrelated to him/her.
- d. Unlike canonical homesign, this kind of SL is not characterised by one-way attempted communication on the part of the deaf signer; rather, communication is frequently successful between him/her and good hearing signers in the network.
- e. This type is typically associated with deaf adults in rural areas.
- f. If the deaf user has children, the SL is likely to be transmitted intergenerationally.

Just as a nucleated settlement is one that is “clustered around a single point” (nucleated settlement, 2015), a nucleated network is clustered around a single node. In a nucleated network SL, this single node is the deaf individual. While a homesign language like David’s is characterised by only weak sign ties to either deaf or hearing people, a nucleated network SL is characterised by both strong *and* weak sign ties with hearing people.

It is an open question as to whether a nucleated network SL must necessarily have only one sign user at its centre. During my fieldwork in Moresby in October 2018, a deaf colleague showed me a video he made of two deaf men in

a village in Sepik Province, communicating very quickly and effortlessly. I am unsure whether the men were closely related (which, if so, would lead us to categorise this as a family SL). If they were not, though, could this language be said to be a very small village SL, or could it be better characterised as a ‘multi-nucleated network SL’?<sup>36</sup> I leave this question open, to be answered once a sign network of this type is fully described.

The simple radial configuration of the sign network in a nucleated network SL differentiates it from other SLs. Consider here the sign network of Zinacantec Family Homesign (Figure 29), and my rendering of it into a diagram (Figure 30):

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<sup>36</sup> As Alan Rumsey has pointed out, an atom’s nucleus contains both protons and neutrons, which are in a tighter relationship to each other than to their surrounding electrons. In this way, it may be that a nucleated network SL can exist with two or more deaf people at its nucleus, with hearing signers fanning out in strong ties from the central deaf cluster. Alternately, as Ronald Planer has pointed out, cells may have multiple nuclei (as in muscle cells), and in an analogous way multiple deaf nuclei could exist within a network.

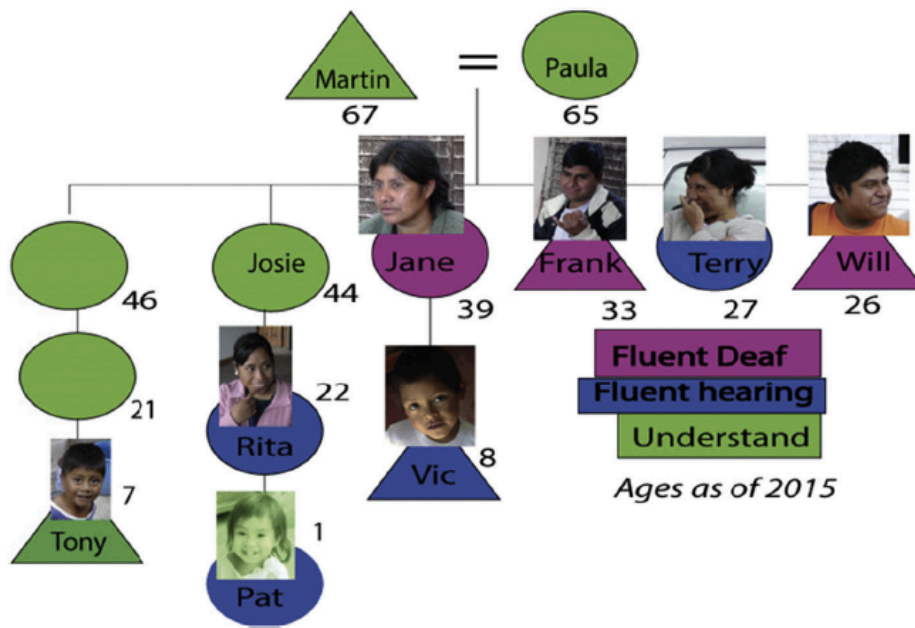


Figure 29: Zinacantec Family Homesign genealogy (Haviland, 2016a, p. 64)

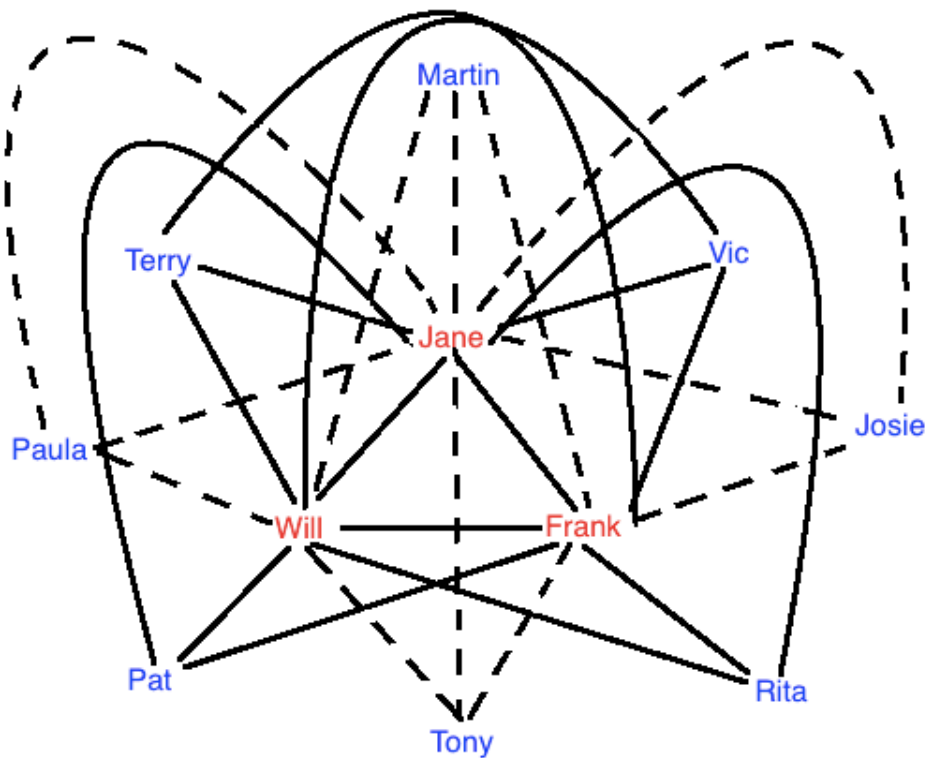


Figure 30: Zinacantec Family Homesign sign network



Here there are three central deaf nodes (Jane, Will and Frank). There are ties linking these deaf nodes, and strong and weak ties linking each hearing signer to each deaf one, according to Haviland's (2016a, p. 64) assessment of that signer's level of fluency.<sup>37</sup> The result is not a hub-and-spoke or simple radial configuration, but an interwoven and interlaced one. Consider now the village of Adamorobe, Ghana, where some 1.2% to 2.6% of the population is deaf and where deaf people meet and communicate with one another regularly, as well as with the many adept hearing signers in the village (Kusters, 2015, pp. 34, 79-104). The resulting sign network would be heavily interlocking and interlinked, with deaf-deaf ties and deaf-hearing ties. It would not exhibit the nucleated characteristic of a nucleated network SL.

I have deliberately not chosen to call a nucleated network SL 'extended homesign' or a similar term that implies that it has developed out of something more like a canonical homesign language. It may well have done so, but the use of the term 'nucleated network' focuses more on the language's current pattern of use rather than its hypothetical origins. I also choose not to repurpose already posited notions such as Zeshan's (2011) "communal home sign" to describe nucleated network SLs. Communal homesign has been explicitly defined as being characterised by sporadic contact between deaf

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<sup>37</sup> John Haviland confirms that hearing-hearing signing in the Z community is rare, noting that "I know that I have seen very sporadic instances of hearing-to-hearing signing, mostly it appears in situations of extra desired privacy in otherwise hearing circumstances" (pers. comm. 15 June 2019).

users, which is not the main site of language use within a nucleated network SL.

Not all Nebilyer/Kaugel SLs are nucleated network SLs. During Rumsey's work with Lewis in 2015, and my work with him in April and November 2018, we did not meet any hearing signer who could communicate fluently and effortlessly with him in a way that those in Kakuyul's sign network could communicate with Kakuyul. While Rumsey did record Lewis and Kakuyul having fluent signed conversation, they are not regular interlocutors. Lewis does sign regularly with his hearing friend, John. However, after several sessions working with John and Lewis, I believe that their communication is characterised by regular communication misses and a need to stick to certain narrow conversational topics, in a way that communication between Kakuyul and those in his sign network is not. As such, on the evidence I have seen so far, Lewis' sign network has no strong ties as he has no regular, fluent sign interlocutors to communicate with.

It is critical, though, to point out that Lewis manages fine despite this. He currently has a job in Mount Hagen, where he lives and pays rent. His previous job was running his own betelnut stall at a market, where much of the transactional communication was with strangers. He goes back regularly to visit his family in his home community and participates in local events such as funeral vigils. The lack of strong sign ties in a sign network is not meant to imply that the deaf person is unconnected to other rich social networks, such as

friends or family, or that they cannot participate in communities of practice such as work. Weak sign ties are sufficient to lead a fairly normal life, as evinced by Lewis' betelnut trade or David's connection to his mother.

Horton's (in press, p.10) taxonomy of homesign languages is very useful in tapping into this category that I feel is so often used only as a 'dumping-ground' for SLs that do not fit other major categories. However, the defining factor in Horton's taxonomy is the degree of interaction a deaf individual has with other *deaf* people. In Horton's taxonomy, all Nebilyer/Kaugel SLs would be classified as "individual homesign", given that their deaf users "[lack] interactions with other deaf individuals" (p. 10). However, classing all Nebilyer/Kaugel SLs in this way would obscure their diversity. I propose that Horton's concept be extended so that individual homesign is defined as the language of a deaf person who does not or cannot by circumstance engage in regular, fluent communication with other signers, be they deaf or hearing; that is, a language characterised by only weak sign ties.

There is a qualitative difference to Lewis' signing compared to Kakuy'l's. Lewis' lexicon appears smaller and the depth to which he can tell a story is limited compared to Kakuy'l. At this stage, I do not wish to posit elaborateness of communication as a categorically definitional feature of a nucleated network SL. However, I do feel that the existence of a network of regular, fluent interlocutors leads to a perceptible difference between an individual homesign language and a nucleated network SL.

Based on the evidence I presented in Chapter 4, I propose sorting Nebilyer/Kaugel SLs into the following categories:

Section	Name	SL type
§4-2.1	Kakuył	Nucleated network SL
§4-2.2	Lewis	Individual homesign
§4-2.3	Tony	Individual homesign
§4-2.4	Peter	Individual homesign
§4-2.5	Sally	Unclear (not enough data)
§4-2.6	Wendy	Individual homesign
§4-2.7	Nina	Individual homesign
§4-2.8	Lily	Unclear (not enough data)
§4-2.9	Sam	Command of some signs, but language mainly spoken
§4-2.10	Anna	Command of some signs, but language mainly spoken
§4-2.11	Roberta	(Young) nucleated network SL
§4-2.12	Delfina	Deaf community SL [PNGSL]

Table 5: Classification of Nebilyer/Kaugel SLs

My classification of the SLs of Peter and Tony as individual homesign is hampered by lack of data, in that I was unable to work with them in their home communities. It may be the case that they do indeed have a network of skilled signers in these places. However, I do feel that after working with them, Peter and Tony's languages are not as elaborate as Kakuył's, leading me to believe

that they do not have many regular, adept interlocuters. Wendy is a somewhat trickier case. I did find her a good signer and obviously quite intelligent, yet no-one I met or worked with in Winjaka could sign well. It may be the case that she experienced life in a nucleated sign network in her birth community before she married into Winjaka. I was also unable to work with her children, who may be her major communicative partners.

In the case of Roberta, it may seem puzzling that I class this as a young nucleated network SL rather than a family SL, given its primary site of use is between Roberta, her parents and her siblings. This is, I believe, merely an artefact of Roberta's young age. A clue is Roberta's former friendship with a deaf girl, the daughter of a visiting pastor. Roberta's interaction with another unrelated signer (in that case deaf, but hypothetically they could have been hearing) leads me to hypothesise that Roberta, like Kakuyi, will go on to recruit signers to join her network. Her language will likely go on to be articulated within a wider sign network as she grows, rather than being restricted to her family.

The mention of Roberta's former deaf friend may seem to confound point (a) above, that a nucleated network SL is characterised by a lack of regular contact between deaf people. My points above can be seen as the characteristics of a prototypical nucleated network SL. Just as not all deaf community SLs fit the canonical characteristics of this type (for example, not all are associated with the nation-state), not all nucleated network SLs necessarily need to fit every

characteristic exhaustively. Certainly, though, I argue that the emerging richness of Roberta's SL is a product of its use among a network of adept signers, rather than being dependent on the sporadic input of a deaf contact, who has indeed now left the community.

### **3. The regional sign network**

In the previous section, I situated each Nebilyer/Kaugel SL within the taxonomy of SLs, including some within the new category of nucleated network SL that I proposed there. I now turn to an account of the high degree of lexical consistency between these SLs. As discussed in §4-4, this cannot be adequately explained on the basis of shared gestures used by hearing people in the same communities, or independent invention based on shared lifeworlds. In §4-3, I also excluded contact between deaf signers as the main channel for transfer of signs. So how can the statistically significant amount of shared signs have arisen with little or no direct contact among deaf signers?

This situation is not unique to Nebilyer/Kaugel. Nyst et al. (2012) noted “a good deal of lexical consistency” across the SLs in rural Mali that they studied, despite many deaf signers having little-to-no contact with one another (p. 267). Osugi and colleagues (1999, p. 102) found that on Amami Island, Japan, even deaf people who reported no contact with other deaf people

whatsoever shared identical signs for 10 out of 25 concepts.<sup>38</sup> Green (2014) finds that deaf signers' signs in Maunabudhuk and Bodhe, Nepal, are "more than incidentally conventional" (p. 84) and goes on to presents a list of "conventional signs" (p. 178-180). While deaf people in this area do have contact (Green, 2014, p. 83), Green mentions deaf emic perspectives that "deaf children [learn] natural signs from hearing people" (p. 84). These perspectives accord with those in Nebilyer/Kaugel discussed in §4-5 that deaf people learn to sign from their parents and friends, and that hearing people gain passive awareness and active command of signing as a result of interaction with deaf people.

Deaf people in Nebilyer/Kaugel have vastly more contact with hearing people on a daily basis than they do with other deaf ones. This is a product of sheer numbers (that is, there are many more hearing people than deaf ones in the region), but also because there is no deaf sociality in this area, i.e., no tendency

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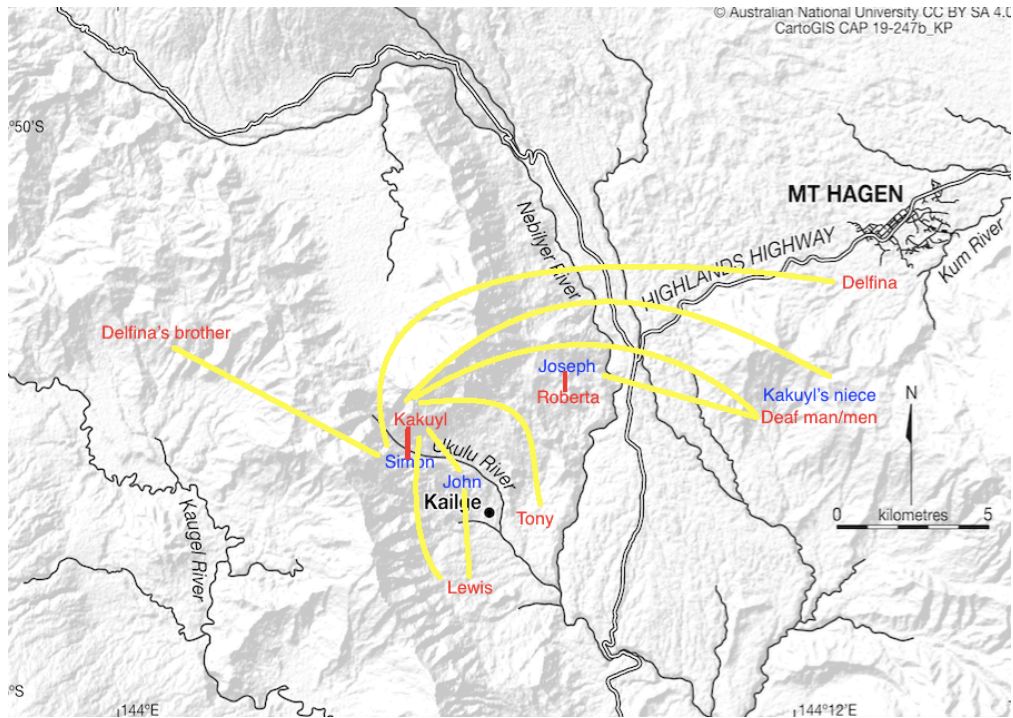
<sup>38</sup> Osugi et al. (1992, pp. 96-97) appear to have used parameter comparison to determine whether a sign was the same or different. I have used a different metric, base comparison. Parameter comparison can lead to a greater likelihood that signs will be rated as different. For example, taking Osugi et al.'s description of COW being formed with two hands with index fingers extended touching the forehead (p. 97), I assume that if the sign were formed with two fists instead of two extended fingers, Osugi et al. would have determined that these signs are different to some degree. Using base comparison, I would determine that the two signs are the same, as they both index the same base: a cow's horns. As such, Osugi et al.'s parameter metric is more conservative than my base metric, which may mean that the 10/25 shared signs mentioned here is actually lower than the amount of shared signs if bases rather than parameters were considered.

for deaf people to interact preferentially with other deaf people. It seems to me that this situation also applies to many deaf people in the studies in Amami Island, rural Mali, and Maunabudhuk and Bodhe cited above. In another Japanese study in the Okinawan islands, 17 out of 38 deaf people had some contact with deaf people during childhood while the remainder had none (Torigoe, Takei, & Kimura, 1995, p. 169). Of those who had some contact with deaf people, 9 of the 17 had “a chance” to meet a deaf person during childhood, while the others reported that as children “they saw deaf people but did not interact with them” (Torigoe et al., 1995, p. 169). At the same time, 36 out of 38 deaf respondents reported that they had interacted with their hearing family “with gestures” (Torigoe et al. 1995, p. 170). This study did not report on lexical consistency between SLs on these islands, but it is clear again here that the majority of signed interactions deaf people experience are between them and hearing people, not between them and other deaf people.

Given the evidence I have presented, and with comparison to other similar rural situations, I propose that lexical consistency across Nebilyer/Kaugel SLs can be explained by the concept of a *regional sign network*. As in sign networks more generally, the nodes of a regional sign network are individual signers, and the regional sign network also has sign ties which can be graded as weak or strong. What is characteristic of a regional sign network is an abundance of *weak* ties between signers. That is, it is characterised by signed communication between signers which is either irregular, not fluent, and/or characterised by different levels of sign competency between signers.



In Map 5, I present a diagram of what I know so far of the regional sign network in Nebilyer/Kaugel. Recall that Kakuyl and Simon belong to one nucleated network, and Joseph and Roberta to another. There are many other hearing people in Kakuyl's sign network tied to him via strong ties (see Figure 28). It is likely that there are sign ties between other members of Kakuyl's and Roberta's networks and members of other networks, but due to limited data, at this point these are unknown. It may also seem that hearing and deaf signers as nodes in this regional sign network are fairly well balanced. Both these points are artefacts of my decision at the time to focus on interviewing deaf signers about whom they signed with. If I had interviewed hearing signers, I believe I would have uncovered many more weak sign ties linking them with various deaf people they sign with irregularly.



Map 5: A partial map of the Nebilyer/Kaugel regional sign network (Red lines denote strong sign ties; yellow lines denote weak sign ties; red denotes deaf; blue denotes hearing. Underlying map by ANU Mapping Department; coloured annotations by Lauren Reed.)

John is a hearing signer who signs fairly regularly but not particularly fluently with both Kakuyul and Lewis; hence, he is weakly tied to both. Kakuyul and Lewis do see one another and sign together, but only once a year or so at relevant community gatherings such as funeral vigils. John is the strongest weak tie, as it were, joining both of these deaf men. We can see how signs can become shared by Kakuyul and Lewis via John, a hearing person, as a mediator participating in both of their sign networks.

We also see how nucleated sign networks may be linked via weak ties. Kakuyul and Simon are joined by a strong sign tie, as are Joseph and Roberta. Joseph

hails from Ulka, where he knows deaf men who sign. As discussed in §4-5, it is likely given living patterns in the Highlands that he returns to Ulka regularly. Kakuyl goes to Ulka somewhat regularly to visit his hearing sister. Kakuyl knows of a deaf man living at Ulka, and indeed went on an ultimately unfruitful trip to Ulka to bring the man back to work with me at Kailge. It is entirely possible that the deaf man Kakuyl is aware of is one of the deaf people Joseph knows. Hence, it is plausible that Kakuyl and Roberta's nucleated networks are linked via this weak tie. Given that Kakuyl's sister is a good signer, it is likely that when she encounters deaf people at Ulka, she will use the signs she has learned from her childhood with Kakuyl to communicate. We see how signs can then become shared between the SLs of nucleated sign networks, and sign networks more generally.

Consider now Lewis' work in Mount Hagen, and the fact that he must use some sign to conduct his business transactions; therefore, he has weak sign ties with his boss, landlord and customers. Lewis shares signs with John, and then uses those signs during signed communication with hearing people in Mount Hagen (and vice versa). It is conceivable, then, that just as Joseph was aware of signing as he was growing up, Lewis' hearing interactants gain some active command of signing via association with Lewis. When they have a need to communicate with another deaf person in the region, they would then be likely to use the same signs for, say, BETELNUT or ONE-KINA they learned from Lewis. We start to see, therefore, how sharing of signs begins to occur across this regional area.

Consider now Simon, who is linked via a strong tie to Kakuyul and a weak tie to his deaf niece (Delfina) and deaf nephew, who live in Mount Hagen and in the upper Kaugel Valley respectively. Simon meets and signs with them infrequently. We can see how Simon's usage of signs can may then start to influence Delfina and her brother's SLs, which are being used outside of my study area.<sup>39</sup> The reverse effect is also true: Delfina and her brother's signs may begin to diffuse into Simon's language, and in turn, to Kakuyul. Similarly, Kakuyul's brother, Sap, is a very good signer who was living in Moresby at the time of my fieldwork there. He worked escorting me to and from the Red Cross School for the deaf daily. Sap signed confidently with the deaf people I was working with in Moresby, using signs I had seen Kakuyul use. I have since received messages from deaf colleagues in Moresby saying they had met and talked with Sap on the buses. Now Kakuyul is connected to deaf signers in Moresby via a weak tie, with his brother as conduit.

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<sup>39</sup> I am aware that in Table 5 and §4-2.12 I defined Delfina's language as PNGSL as that is her preferred code. As mentioned in §4-2.12, I have, however, seen her use local ways of signing with Kakuyul, so she can evidently use local ways of signing and will use these with people who do not know PNGSL.

An important feature of the Nebilyer/Kaugel regional sign network is that because hearing people in the region do not sign with one another except in the presence of deaf people, any deaf person can be separated from another deaf person via a maximum of two sign ties. Some of the expected configurations of ties under this scenario are:

deaf ----- deaf

deaf ----- hearing (and vice versa)

deaf ----- hearing ----- deaf (and combinations of same)

deaf ----- hearing ----- deaf ----- deaf ----- hearing (and so on)

\* hearing ----- hearing

A weak tie of “hearing-hearing” is highly unlikely because hearing people do not sign together unless a deaf person is present, and therefore there is no standalone hearing-hearing weak tie. Deaf people may be linked via weak ties to many more hearing signers than deaf ones, given the much higher proportion of hearing people the region. However, deaf people are a critical part of the regional sign network as their nodes in the network likely have many more weak sign ties branching out from them than do hearing nodes.

I propose that most sign sharing in Nebilyer/Kaugel has not occurred via independent invention or recruitment of majority community gesture, but rather has occurred via a process of diffusion along these weak sign ties.

Milroy and Milroy (1985) argue that weak ties are the most likely pathways for

diffusion because weak ties between individuals are more numerous than strong, and therefore many more individuals can be reached via weak ties than strong ties (pp. 364-365). In addition, information shared over strong ties quickly becomes non-innovatory or non-novel (Granovetter, 1973, p. 1366). It very quickly diffuses along one's smaller network of strong ties, and then the strong ties favour norm maintenance (Milroy, 1980, pp. 177-178). However, when information travels via a weak tie, it reaches a new individual that the rest of one's strong ties are likely unconnected to. That individual then goes on to diffuse the information to others who they are linked to via strong and weak ties. Thus, it is via weak ties that information is most widely diffused throughout a network.

This is the most likely explanation for the high degree of base similarity of signs shared by Nebilyer/Kaugel SLs. In many ways, this is a natural extension of Zeshan's (2011) concept of communal homesign, where sign sharing is driven by "sporadic, unsystematic contact" between deaf signers (p. 228). Conversely, in a regional sign network such as that in Nebilyer/Kaugel, sign sharing is driven by sporadic, unsystematic contact (or in other words, weak ties) between not only deaf signers but hearing ones as well. I note here de Vos' (2016, p. 212) exhortation that if hearing people are excluded from our analyses, we are ignoring an overwhelming percentage of signers in a community – or, indeed, within a network.

Individual homesign languages or nucleated network SLs are not predicated on the existence of a regional sign network. That is, it is entirely possible to have a discrete SL that is unconnected to other SLs in the region. Consider here Kagobai's SL, used on Rennell Island in the Solomons (Kuschel, 1973, 1974). Kagobai did not leave the island until he was 42, and therefore if he met any other deaf people in his life, it was not until that late stage (Kuschel, 1973, p. 7). It seems unlikely given Rennell's geographic isolation that hearing signers in Kagobai's network would have a) made frequent-enough trips to the main islands (some 200 km away by boat) and b) encountered deaf signers during any such trips to seed Kagobai's SL with signs borrowed from other SLs. Hence, Kagobai's SL appears to be a good candidate for one existing separate to a regional sign network.

The regional sign network concept may prove useful for other analysts. For example, Schuit (2012a, 2012b, 2015) describes Inuit Sign Language (IUR) as one entity, despite it being used in geographically disparate communities in remote northern Canada. These communities are only linked via plane transport, which is expensive, and perhaps accordingly Schuit (2012b) comments that "face-to-face contact among deaf Inuit from different communities is rare" (pp. 389-390). Therefore, how has the sharing of signs and grammatical strategies occurred in IUR? I hypothesise that this has occurred in part via weak sign ties linking both deaf and hearing signers who live in the three communities Schuit worked in. Likewise, the conventionalisation of signs in Maunabudhuk and Bodhe, Nepal, is likely

driven not only by weak ties between deaf signers in the region, but between hearing and deaf signers as well. The existence of a regional sign network could also answer the question I posed in §3-3: How, elsewhere in PNG, could Kendon's (1980a) hearing field assistant communicate with a deaf woman despite never having met her before and hailing from some 20 miles away (p. 4-5)? This looks like another instance of a regional sign network, where common signs are known by signers (deaf or hearing) across the region, as a result of the interaction of deaf and hearing signers across that network.

Similarly, Osugi et al. found that even "isolated" deaf people with no connection to other deaf individuals on Amami Island still shared 10 out of 25 of signs. In addition, the "isolated" deaf people and the deaf family group Osugi et al. (1999) worked with shared 7 out of 25 signs (p. 102). The authors write that "clearly, to adequately explain the overlap in the gestures across these groups is quite an enormous task, and should be left for future research" (Osugi et al., 1999, p. 102). Osugi et al. had already established that members of the "isolated" deaf group had no contact with one another or other deaf people on the island. However, if they were to consider the hearing people in those deaf people's networks and those hearing people's connection to other deaf people, I believe that the "enormous task" of explaining shared signs could be productively undertaken.

The regional sign network does not exist in a vacuum. It is interlocked with other social networks and communities of practice (Milroy, 1980; Lave &



Wenger, 1991) in the region, including clan membership, affinal (i.e., marriage-based) networks, occupation, and church membership. For example, Kakuyil and Lewis' interaction as children had nothing to do with their deafness, but rather was driven by the fact that Lewis' mother is from Kakuyil's clan. Indeed, the two men's interactions now overwhelmingly occur in the context of sporadic events such as funerals where two clans come together. Additionally, the main setting in which Kakuyil and Tony interacted with one another was not as deaf men, but as co-workers on the building site of the high school in Tony's community. Roberta's meeting of the pastor's deaf daughter, I argue, would not have occurred were Roberta's family not members of that particular church. That is, the two girls would not have been brought together by their families purely on account of their deafness; rather, their interaction occurred as a result of their membership of a separate community of practice. Given examples such as these, in order to describe and understand a regional sign network, it is critical to not consider it in isolation, but to see how it interweaves with other social networks and communities of practice.

I resist giving the Nebilyer/Kaugel regional sign network a language-like name, such as "Nebilyer/Kaugel Sign Language". This is for two reasons. Firstly, there are many shared signs with the network, but individual SLs at each node are often very different in terms of elaboration and complexity. Hence, describing the regional sign network as a single language inappropriately downplays the variation within it. Secondly, it is unclear where the regional sign network ends. I did not work within a bounded community,

such as Bengkulu, Indonesia, where Marsaja (2008, p. 96) was able to survey 83% of the population with confidence. The limits of the sign network on Map 5 represent only the limits of my fieldwork. I choose not to use Hou's (2016) concept of a "constellation" of SLs to describe the sign network, because the notion of a constellation implies a boundedness. This is entirely appropriate to Hou's fieldsite of two densely populated neighbouring villages, but it is not for Nebilyer/Kaugel. Unlike constellations, networks have no limit, or can be of indeterminate extent. As I have mentioned, it is likely that the network I have described is much larger within the valleys in question, and flows and blends with other regional sign networks throughout PNG.

## CHAPTER SIX:

### CONCLUSION

While it is not possible to observe the genesis of spoken language *ex nihilo*, there are many SL situations worldwide where languages can be examined in their very first generation of use. This gives us an unparalleled opportunity to consider how patterns of human interaction and other social factors give rise to different language shapes. In this way, the focus in sign linguistics of explicitly sorting languages by their sociodemographic patterning is beneficial to linguistics more generally, because it allows us to determine associations between those patterns of use and features of language.

In this thesis, I have offered the concept of a sign network as a descriptive tool for the amount of quality interaction a deaf signer has, whether his/her interlocutors are deaf or hearing. I have suggested expanding the sociodemographic typology of SLs to include nucleated network SLs, which are characterised by a central deaf signer surrounded by a sign network of adept hearing signers who interact with him/her regularly. This is, I believe, the ‘missing link’ in the sociodemographic typology of SLs, and brings some light to the “grey area” of scholarship Nyst (2010, p. 416) identified lying between deaf community SLs and homesign. Similarly, I have argued for the expansion of Horton’s (in press) “individual homesign” to consider not only deaf-deaf signed interaction, but deaf-hearing signed interaction too. I also have grappled with the question of how to explain lexical consistency over a wide area

through the notion of a regional sign network, which explains sign diffusion via weak sign ties. Both nucleated network SLs and the regional sign network are, I hope, valuable explanatory tools for other sign linguists working in rural areas.

I opened this thesis with Woodward's (2011) advice that upon encountering a fieldsite, a linguist should not begin with structural description of a language, but should first ask "how many...languages" exist there (p. 48). I have moved beyond a mere tally of languages and dialects, and rather considered more deeply how languages may be interrelated in more subtle ways than a language *vs* dialect division. In addition, when encountering language diversity, I have explicitly attempted to explain why different languages may pattern differently, which I have found is related to the qualities of the social network they are used in. Additionally, I have presented an alternative method to sublexical parameter comparison; namely, that of sign base comparison. I believe this will be a useful method for sign linguists working with young SLs.

A next step is to empirically test the notion of a regional sign network, whether in Nebilyer/Kaugel or elsewhere. I aim to return to PNG and begin with sociodemographic interviews regarding sign use not only by deaf signers, but hearing ones as well. I also am curious that signers living in Moresby have 40% lexical consistency with signers in the Highlands, despite them having no contact whatsoever. I plan to test this by looking at a control case in a culturally similar area; namely, by comparison of sign bases in PNG with that

of Kagobai on Rennell Island, who is thought to have had no contact with other deaf people for his entire life (Kuschel, 1973, 1974).

Even though they are linked via the regional sign network, Nebilyer/Kaugel SLs are particularly vulnerable to disappearance as they are predicated on the existence of one deaf user. Once that user dies, the SL will cease to exist. This situation is undoubtedly not unique to Nebilyer/Kaugel, but to other similar SL situations worldwide. In addition, nucleated network SLs such as Kagobai's (Kuschel, 1973, 1974) may exist without a corresponding regional sign network. This situation makes them even more precious, given they are individually-centred creations.

Indeed, SLs more generally are vastly more vulnerable to language extinction than spoken languages. Safar and Webster (2014) surveyed researchers and users of 15 SLs of the world and found that every one of them was endangered to some degree, based on criteria from the UNESCO survey of "languages in danger" (Moseley, 2010). It is also essential to consider that the main users of SLs – deaf people – face major challenges in addition to the threat to their languages, such as exclusion from education and certain fora of employment. As such, SL endangerment is made even more of a critical issue, given that already vulnerable people are made even more so by the threat to their language (cf. Braithwaite, 2019, p. e180).

Arguably more so than any other development in linguistics, the rise of sign linguistics has deepened our understanding of the human capacity for language. This is not only a question of language structure; rather, the study of young SLs gives us insight into the irrepressible, universal human drive to communicate and make meaning with those around us. Every SL that is lost is a missed chance to understand our very essence as humans. As such, their documentation is invaluable, crucial, and urgent.

# APPENDIX A:

## INFORMATION SHEET



### Information sheet for Project on Kailge Sign Language

#### Researchers:

We are Alan Rumsey, Francesca Merlan, and Lauren Reed. We work at Australian National University in Canberra. Lauren is also a student at ANU.

#### Project Title:

Study of sign language in West Highlands, Papua New Guinea

#### General Outline of the Project:

As you probably know, Alan and Francesca have been coming to Kailge for a long time to study the Ku Waru language and people's way of life here. We are very interested in this and it is part of our job. Now we are starting a new study, of the sign language (*ki ung*) that people use at Kailge for communicating with deaf people.

Another person from ANU is going to join us in the study. Her name is Lauren Reed. She is an expert in sign languages. Her younger brother and sister are deaf and she has been communicating with them and other deaf people in Australian Sign Language since she was a little girl. She has also studied sign languages used in other parts of the world and is very interested in comparing them in order to understand how they work. We have told her about Kopia Kakuyul, Tilka Lewa and others communicating in sign language. She is very interested and has come with us in order to work with people at Kailge to find out more about their sign language.

We will work with Lauren on this and help her understand when people explain things in Ku Waru. We will make videos of Kakuyul, Lewa and others using sign language. We will watch the videos with people who are working with us and ask them questions about what is happening in the videos. We will also ask people working with us to explain things that may not be in the videos, like how to translate things from Ku Waru into sign language and from sign language in to Ku Waru. We will also ask people working with us questions about how they learned sign language, who they they it with, and what other people they know of who use sign language, including deaf people and people who can hear. We will then visit those people and ask them the same questions.

#### Exclusion criteria:

We can only work with you if you know sign language. If we decide we can work with you, we will tell you more about the project on the work agreement.

#### Participant Involvement:, Confidentiality: Privacy Notice:

The above sections are detailed on the oral consent form (titled 'work agreement'). We intend for this information sheet to be not just for participants, but also for interested local people who may not know enough sign to participate. "Nuts and bolts" such as confidentiality and remuneration are detailed on the work agreement, essentially an expanded oral consent form.



#### Data Storage:

Lauren is doing this study as a part of her work for a Masters Degree at Australian National University. After she has worked with us and gotten to know people at Kailge she will stay on there for some of the time after we are back in Canberra. All the recordings and our notes from this project will be brought back to Canberra. We will also give copies of the recordings to people at Kailge on small SD cards that they can play on their phones.

In Australia all the recordings and our notes on them will be stored in a kind of electronic library called PARADISEC. They will be kept there for a long time – probably for hundreds of years or more. Copies of it will be stored on computers in more than one place so they will be safe in case they are accidentally lost or destroyed at one of them.

#### Queries and Concerns:

If you would like know more about this project we would be glad to discuss it with you when we are there or on the phone from Australia. You can call us on:

Alan: +61 431 221 855

Lauren: +61 438 583 808

#### Ethics Committee Clearance:

The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee (Protocol 2018/084). If you have any concerns or complaints about how this research has been conducted, please contact:

Ethics Manager  
The ANU Human Research Ethics Committee  
The Australian National University  
Telephone: +61 2 6125 3427  
Email: [Human.Ethics.Officer@anu.edu.au](mailto:Human.Ethics.Officer@anu.edu.au)

#### Privacy Notice:

In collecting your personal information within this research, the ANU must comply with the Privacy Act 1988. The ANU Privacy Policy is available at [https://policies.anu.edu.au/pp/document/ANUP\\_010007](https://policies.anu.edu.au/pp/document/ANUP_010007) and it contains information about how a person can:

- Access or seek correction to their personal information;
- Complain about a breach of an Australian Privacy Principle by ANU, and how ANU will handle the complaint.



## APPENDIX B:

### CONSENT FORM



#### Consent form and work agreement for project on Kailge Sign Language

This agreement is about a study of the sign language that people use at Kailge, Western Highlands Province, PNG. The people who are doing the study are Alan Rumsey, Lauren Reed and Francesca Merlan from Australian National University. To help them with their study I will be doing one or more of the following things:

- let them make videos of me using the sign language to communicate with other people
- watch the videos with them and answer their questions about them
- answer other questions they ask me about sign language, for example about how I learned it, who are the other people I know who use it and how to find them, or about to say certain things in sign language

In the videos or other recordings that have me in them, if there is anything that I do not want to be in them, it will be taken out. We will watch the videos we make either on the same day or the next day, and you can tell us if you want us to take something out.

Can we show these films to other deaf and signing people in Western Highlands, in Papua New Guinea, and in the world? We want to do this to see if their sign language is like yours. (Strike out any not agreed to) Yes/No

Can we show these films to people like us at other universities in the world? Yes/No

What name would you like us to use for you – your real name, a different name, or no name?

All the recordings and transcripts that I give my permission to keep will be stored in an electronic library in Australia where I can get copies of them if I want them. Others can also get copies if I and the other people in the video agree to it. If any articles or books are published that come out of this project Alan, Francesca or Lauren will give me copies of them.

For the work I do on this project I will be paid 20 kina an hour. If other people help me with the work I will not ask Alan, Francesca or Lauren to provide extra payment to them. If they are paid anything it will come from me out of the money that I am paid for the work.

May we start now?

Date of this consent to be recorded:

## APPENDIX C:

### PHONOLOGICAL REDUCTION IN KAKUYL'S SL

Some signs in Kakuyl's SL have undergone phonological reduction so that the iconic base is somewhat obscured. Consider Figure 31, which was the sign for SLEEP that Kakuyl produced for me, in one of our very first sessions together. Later, when Kakuyl and the good hearing Kailge signers were conversing, I began to see that this version of SLEEP was never used. Rather, he and they used a phonetically reduced version where the hand assumes the same orientation but is not located on the head, rather in neutral sign space (see Figures 32 and 33). Even after we take into account the phonological process of reduction the sign has undergone, the base (sleeping on one's hands) is still identifiable. Indeed, the eyes are often closed during production of SLEEP, which helps identify the base as well. See also Reed (2019c) for reduction of HOUSE, available at <https://vimeo.com/344214788>.



Figure 31: Kakuyl (centre), SLEEP (while working with Lauren, left) (20180403\_Canon01\_002 23:34)



Figure 32: Nikindi (left), SLEEP (talking alone with Kakuyi, right) (20180419\_Canon01\_001 9:19)



Figure 33: Simon (right), SLEEP (talking alone with Kakuyi, left) (20180408\_Canon01\_001 2:54)

## APPENDIX D:

### CODING SAMPLE OF NEBILYER/KAUGEL SIGN BASES

	KAKUYL			TONY		
	Base	Form	Archival ref	Base	Form	Archival ref
<b>MAN</b>	beard	grasp chin	20180403_Cano n01_002 3:26	beard	grasp chin	20180405_Canon0 1_002 15:10
<b>WOMAN</b>	breast	touch breast	20180403_Cano n01_002 3:08	breast	touch breast	20180405_Canon0 1_002 15:10
<b>OLD(PERSON)</b>	hold walking stick	fist hand bobs forward	20180403_Cano n01_002 3:27			
<b>CHILD</b>	height	flat hand parallel to ground	20180403_Cano n01_002 3:57	height	flat hand parallel to ground	20180405_Canon0 1_002 15:10
<b>CAUCASIAN</b>	smooth hair	smooth hair back	20180403_Cano n01_002 5:37	smooth hair	smooth hair back	
<b>BIRD</b>	bird's wings	flap hands	20180403_Cano n01_002 5:41	bird's wings	flap one hand	20180405_Canon0 1_001 19:23
<b>FLYING-FOX</b>	bat's wings	flap elbows	20180403_Cano n01_002 5:46	flight and biting of bat	scrunch forward and mouth bites	20180405_Canon0 1_001 19:38
<b>PIG</b>	tethered pig + pig's sound	grasp wrist	20180403_Cano n01_002 6:33	tethered pig + pig's sound	grasp wrist + bilabial trill	20180405_Canon0 1_001 19:54
<b>DOG</b>	pouncing of dog	clawed hands bounce forward + whoosh OR "owa" from mouth	20180403_Cano n01_002 6:37	pouncing of dog	clawed hands scrabble forward + whoosh from mouth	20180405_Canon0 1_001 20:00
<b>CASCAS</b>	cascas whiskers	twiddle imaginary whiskers	20180403_Cano n01_002 6:43	climbing of cascas	clawed hands "climb" tree	20180405_Canon0 1_001 20:09
<b>FISH</b>	hook in mouth	crooked finger in mouth		flick rod out of water	fingers mime flicking	20180405_Canon0 1_001 22:04
<b>FROG</b>	how to catch a frog	hand comes forward and quickly closes to fist	20180403_Cano n01_002 10:37	jumping of frog	flat hands steady then jump forward	20180405_Canon0 1_001 22:13

Note: Same colour denotes same base; different colours denote different base

**APPENDIX E:**

**KAKUYL'S EMIC PERSPECTIVE (ORIGINAL SIGNED UTTERANCE)**



HE

ONE-THING



BAD-EYE

OTHER-THING

ME

SAME



THAT'S-RIGHT



HE

TALK

SIGN-WILDLY

SIGN-WILDLY



NEG

DON'T-KNOW



BAD-EYE

GOOD

SAME/FRIENDS

GOOD

(20180331\_Canon02\_007 11:19-12:04)

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