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The Balinese Homesign Corpus: New insights into corpus development in a rural signing context

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The Balinese Homesign Corpus is a collection of homesign varieties that emerged within the same gestural context as sign languages that are used in northern Bali, such as Kata Kolok. This paper provides a detailed account of the data collection process carried out by a group of local research assistants. An ethnographic overview of the social interaction among homesigners with Kata Kolok signers is also provided. We suggest that several factors, such as topography, gender-specific norms, and technology, may play a role in the social networks of the homesigners. Furthermore, we observe that homesigners in Bali are not living in complete isolation. While they might not have full access to all domains of social life, they are tightly integrated into religious duties and family routines. This paper highlights the importance of locally led data collection for improving the ecological validity and the quality of data. We suggest methods like mobile ethnographic filmmaking (Moriarty 2020) could provide valuable insights into the role of social interaction in the emergence of homesign in future work.

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1. Introduction[1]

Homesigns are visual communication systems developed spontaneously by deaf individuals who have not had access to a conventional sign language and who, due to their deafness and the modality difference between signed and spoken language, cannot acquire the ambient spoken/written language (e.g., Brentari & Goldin-Meadow 2017). By looking at the linguistic abilities of such individuals who grow up in the absence of conventional language input, it becomes possible to consider what de novo languages look like.

Without a language model to draw from, homesigners co-create communication systems that contain some features typical of natural language (Brentari & Goldin-Meadow 2017) together with their family members and other frequent interlocutors. In the past few decades, an abundance of studies have investigated the phenomenon of homesign on different linguistic levels, for instance, constituent order (Hunsicker & Goldin-Meadow 2012), subject marking (Coppola & Newport 2005), deixis (Coppola & Senghas 2010), the distinction of nominals and predicates (Goldin-Meadow et al. 2015), spatial modulations of verbs (Senghas & Coppola 2001), marking of agentivity (Goldin-Meadow et al. 2015; Rissman et al. 2020), and phonological complexity (Brentari et al. 2012).

Moreover, scholars have been interested in the effects of language acquisition (or, more accurately, language deprivation) on (socio)cognitive functions such as numeracy (Coppola et al. 2013), spatial cognition (Gentner et al. 2013) and Theory of Mind (Gagne & Coppola 2017). This rapidly growing body of literature has had a major impact on our understanding of the risks of long-term language deprivation. Given that the vast majority of deaf children around the world grow up without access to schools with the necessary support and accommodations for their needs, these findings highlight the importance of early language input for the development of (socio-)cognitive abilities (Humphries et al. 2014). The World Federation of the Deaf (2016) estimates that globally 70% of people deaf from birth grow up as homesigners, but this proportion may be as high as 90% in some countries according to Coppola (2020). This means that many deaf children are raised by parents with no knowledge of a sign language, which could have significant impact of their language development (Cannon & Kirby 2013).

Nevertheless, very little is known about homesigners as individuals, and what their social and communicative lives are like. Ethnographic studies about homesigners are scarce (but see Goico 2019; Neveu 2019; Horton 2020a), and little attention has been paid to homesigners' pragmatic and communicative skills such as turn-taking (Goico 2019; Haviland 2020) or conversational repair (Safar & de Vos 2022; de Vos 2023). In addition, many different contexts of language emergence are lumped together under the umbrella term "homesign" (Goico & Horton 2023). Consequently, several authors (Nyst et al. 2012; Horton 2020b; Hou & de Vos 2022; Reed 2022) have stressed the need for refined terminology, as signed communication can emerge in a variety of sociolinguistic and socioeconomic constellations; in urban or rural settings; with or without access to formal education; and nestled within varying ideologies toward deafness and visual communication. Just as no two homes are the same, no two homesigns are alike.

Nyst and colleagues (2012) argue that sweeping claims about the linguistic and cognitive abilities of homesigners have been made based on studies conducted in WEIRD (Western Educated Industrialized Rich Democratic) countries (Henrich et al. 2010), under circumstances where deaf children are encouraged to learn to speak, and visual-gestural communication is deliberately suppressed due to its alleged interference with spoken language acquisition. They introduce the notion of rural as opposed to oral homesign to encompass the signing of individuals who grow up without input from a "conventional" sign language, but with rich access to co-speech gestures and without a prevailing oralist ideology that prioritizes speech over visual communication. Other labels such as "communal homesign" (Zeshan 2010), "shared homesign" (Horton 2020a), or "multi-generation homesign" (Neveu 2019) have been suggested, to capture a variety of circumstances where deaf signers – despite their lack of access to a larger signing community – do have some sort of "micro-community" of hearing and/or deaf communication partners. Larger datasets capturing such signing practices are few and far between, and none of them has been made accessible to the broader academic community.

[1] We thank all the Balinese homesigners and their families for willingly participating in our study. We thank Door Spruijt for initial data management for this project, Calle Börstell for the map he produced, Danielle Naegeli for her trial experiment material, and Marc Swerts for insightful discussion and feedback. This work was supported by the European Research Council (ERC starting grant 852352 - Emergence of Language in Social Interaction (ELISA)).

This paper presents the Balinese Homesign Corpus[2] which includes both elicited and spontaneous data of homesigners in the North of Bali collected by a team of local research assistants. We sketch out the interaction patterns of the homesigners in the corpus; to do this, we draw on detailed ethnographic fieldwork and semi-structured interviews around questionnaires. In addition, we also include an ethnographic overview of the social interactions between homesigners in our corpus and Kata Kolok signers. Because all data collection was carried out by a team of deaf and hearing research assistants from Bali and Jakarta, we also reflect on how this affected the documentation process.

The Balinese Homesign Corpus is the first of its kind, since previous studies on homesign drew on a limited number of participants, and many were based exclusively on elicited data. We believe that the construction of larger corpora of homesign data that include (i) various types of linguistic data that can be compared systematically across participants, (ii) a diversified sample of participants with different socio-communicative profiles and (iii) detailed and ethnographically informed metadata, is crucial to better understand how social and cultural factors influence the emergence of new means of signed communication.

This article is structured as follows: §2 introduces Bali's cultural, social, and sign language context. §3 covers the data collection process, starting with descriptions of data collection sites, the identification and recruitment of participants, and the process of data collection led by the local team in Bali. §4 explains the social interaction patterns within homesigners and with KK signers. We also discuss several factors that might influence the homesigners' communicative repertoires. §5 details the data we collected, the archiving process, and the equipment we used. Lastly, in §6, we evaluate how locally led data collection is important in collecting ecologically valid datasets and building local competencies and capacities.

2. Bali: Cultural, social, and sign language contact

As a popular tourist destination, Bali has implemented "sustainable cultural tourism" (Arka 2007: 74) by maintaining local traditions and has therefore benefitted from tourism industries. While the southern part of Bali is well-known to international visitors, the northern part of Bali stretches from foothills to mountainous highland and is less exposed as a tourist destination (Branson et al. 1999: 111). However, there are pockets in North Bali too that have become frequented by tourists. For example, the village Bengkala is particularly popular among deaf tourists due to its high percentage of hereditary deafness and the widespread use of a village-wide sign language, Kata Kolok (Winata et al. 1995; Marsaja 2008). Many deaf visitors come to experience the lives of the deaf and hearing signers and interact with them in this "deaf village" (Moriarty 2020). Kata Kolok has also been documented and researched over the past 20 years (de Vos 2012).

In general, Balinese people are bonded by shared ritual obligations to ancestors and to the village temples. The cultural rituals followed by Balinese people are based on Hindu traditions, and they continue to implement "traditional social structures and traditional leadership" practices to this day (Arka 2007: 6). Balinese people are interconnected mainly through kinship and clan links (Branson et al. 1999: 114), which results in extensive social networks. All participants in this data collection are actively involved in said ritual activities, which are usually held in a family temple in a particular location and provide opportunities for social interaction between deaf individuals and hearing relatives (see Appendix D for an overview of all participants). With this in mind, one can say that the foundations of social networks in Bali are rooted not only in familial or friend-like relations but also in professional and religious bonds, and this includes deaf individuals, or in this case, homesigners. We have now outlined the social and cultural context in which signed language varieties in Bali emerge.

As mentioned, Kata Kolok emerged as a rural sign language about six generations ago due to sustained hereditary deafness in Bengkala. There are several other rural sign languages, such as Adamorobe Sign Language in Ghana (Nyst 2007), Alipur Village Sign Language in India (Panda 2012), and Providence Island Sign Language in Colombia (Omardeen et al. 2021). However, Kata Kolok's time depth is remarkable because most rural sign languages across the globe have arisen much more recently (de Vos & Nyst 2018). The initial stages of the emergence of Kata Kolok are relatively clear from genetic and anthropological data collected through the years (see discussion by de Vos 2012: 40–49, and the updated

[2] Deposited at The Language Archive (TLA), Max Planck Institute for Psycholinguistics. Metadata are available at https://hdl.handle.net/1839/52a624e0-bc5a-4dbf-b7ed-953fbc61279d (accessed on 27 February 2025).

genealogy by Lutzenberger 2022: 43). It is believed that Kata Kolok started with a single homesigner who had no input from a conventional language (Generation 0). Then, there was a cohort of five deaf signers in his family (Generation I). Sadly, these generations, along with Generation II, are no longer alive.

Various socioeconomic factors both support and threaten the existence of Kata Kolok (Lutzenberger 2019; Webster & Safar 2019). "Deaf tourism" (Moriarty 2020) is one of the threatening factors that stems from foreign deaf signers who bring Kata Kolok into contact with other sign languages. Similarly, marriages between Kata Kolok signers and signers from other regions in Bali, such as Singaraja and Denpasar, lead to influence from BISINDO (Bahasa Isyarat Indonesia (Indonesian Sign Language) see also Palfreyman 2019 for details on variation in BISINDO).

Regarding other sign languages in other parts of Bali, Palfreyman (2018) studies a variety of BISINDO used by the urban deaf community in Singaraja, but further studies on other signing varieties used in Bali are yet to follow. This paper focuses on the homesign varieties that emerged from the same gestural context as Kata Kolok and BISINDO in Singaraja. Therefore, systematic comparisons of the emergence of linguistic structures from culture-specific gestural patterns become feasible, whether in the context of interaction between homesigners, in the incremental formation of rural deaf communities, or as a result of the initiation of deaf education. In the next section, the data collection process is explained.

3. Data collection

The data collection was carried out by local team members in 2020 and 2021 during the COVID-19 pandemic, with careful health measures in place. This data was collected within the research project ELISA ("Emergence of language in social interaction"; ERC starting grant 852352) funded by the European Research Council and awarded to Dr. Connie de Vos. Collaboration throughout the project included two international researchers from Tilburg University, Dr. Connie de Vos and Dr. Josefina Safar.

The team that carried out data collection for the Balinese Homesign Corpus consisted of four members: Ketut Kanta (hearing), Ni Made Dadi Astini (deaf), Ni Made Sumarni (deaf) and Satyawati (hearing). Ketut Kanta (Kanta) is a hearing person, native to Bengkala, who has been involved in various research projects on Kata Kolok since 2005. He advocates for the interests of deaf people in the Kata Kolok community and has taught at the Bengkala deaf school. He has been a gatekeeper in Bengkala for many years, that is, he frequently coordinates and translates between the deaf villagers and others, including the local government, researchers and international visitors (de Vos 2012b). This has allowed him to create an extensive network in the villages surrounding Bengkala and knowledge of homesigners who might live there. Ni Made Dadi Astini (Dadi) and Ni Made Sumarni (Sumarni) are two deaf research assistants from Bengkala trained by Connie de Vos and Hannah Lutzenberger in various linguistic research projects since 2010 and 2017 respectively (NWO Veni, The face in sign language interaction 2016-2020; FWO-NWO, The emergence of phonology in six generations 2017-2022; ERC Starting Grant, Emergence of Language in Social Interaction 2020-2025; ELDP, Documenting endangered sign languages in Java and Bali 2023-2025). Throughout this time Dadi and Sumarni also collected longitudinal data of deaf and hearing children acquiring Kata Kolok natively. Satyawati is originally from Jakarta and completed her MA in Linguistics at Udayana University, Bali. She is an experienced hearing BISINDO sign language interpreter based in Denpasar.

The locally led fieldwork gave the local team members hands-on experience with data collection. It provided an opportunity for them to be actively involved in decision-making processes and empowered them to have control of managing the data collection. This is remarkable as local community members are rarely represented in the literature as having a vital role in the data collection process (Dikyuva et al. 2012). Indeed, this type of collaboration fosters greater accuracy and validity and increases the likelihood of the research having utility for the language community in question.

In the next sub-sections, more detailed information is given about locally led data collection, including the field sites, the process of identifying and recruiting participants, and the data collection process.

3.1 Field sites

There are nine districts in Buleleng regency. The data was collected from two districts: Kubutambahan (villages Bulian, Mengening, and Tajun) and Sawan (villages Bebetin and Suwug). The locations of the villages are shown in Figure 1. In total, 13 adult homesigners, whose ages range from 22 to 65 years old, and one child homesigner aged 4 years old, were sampled.

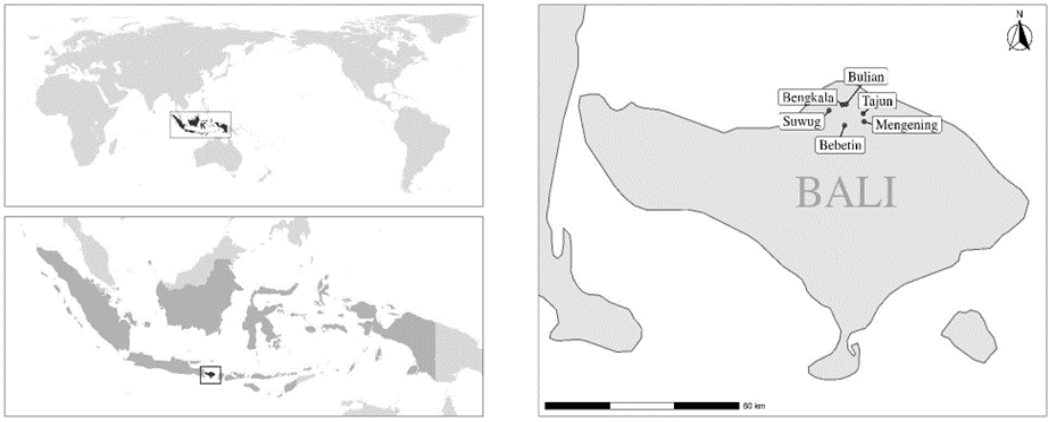

Figure 1. Maps of Indonesia and Bali island with five identified villages and Bengkala.

The field sites are surrounded by hills and mountains; rocky roads, bushes, rivers, and rice fields. The participants' houses were usually off the main roads. Therefore, the local team mainly used motorbikes to get around while carrying two cameras and tripods. The travel time was around 60 minutes to each participant's house, with a total distance of around 20 kilometers. The local team was based in Bengkala. It is worth mentioning that travel times to field sites varied according to the quality of the roads rather than geographical distance. For example, Tajun is the furthest away from Bengkala, but it only takes around 30 minutes to get to the participant's house because it is situated close to the main road. On the contrary, travelling to Mengening is rather difficult with rocky terrain and narrow uphill roads despite it being relatively close to Bengkala. This is because the participant's house is not within an easy reach of a main road, but rather situated in a rural area and therefore takes approximately 60 minutes to get to.

3.2 Locally-led data collection

By combining the knowledge and drawing on the networks of local team members, we gathered information about potential homesigners scattered around the Buleleng area. Initial contact was made by visiting the participant's house and introducing the local team members. Kanta and Satyawati used Balinese and Bahasa Indonesia to explain the purposes of the research project while also informing the hearing family members about our general interest in signing varieties in Bali. In parallel, Dadi and Sumarni adopted a combination of Kata Kolok with local gestures, to communicate with the potential participants about the purposes of the current research project. Information about other potential homesigners in the area that family members or participants might know was also collected. More details about the project and the data collection process were then given. Afterwards, the general data collection process began. This included video recordings of (semi-)spontaneous conversations between homesigners, their family members, and the local team. Additionally, several elicitation tasks were conducted, specifically a picture elicitation task, a language game, and a retelling of the Canary Row cartoon. These procedures were carried out with all participants. Over the course of several visits, the local team established a good level of rapport and communicative ease with the homesigners and their families.

Collaborating with *local* team members for data collection can be very beneficial: in this case, their involvement led to increased effectiveness and ease of connection with the homesigners and their family members (Braithwaite 2020; fur-

ther discussed in §6). As a native Balinese speaker, Kanta was able to establish rapport with family members of the participants while communicating our goals with a culturally appropriate approach. Similarly, as deaf individuals from the same region, Dadi and Sumarni were able to connect easily with the homesigners due to their shared deaf experiences (Dikyuva et al. 2012; Hill 2015). This is not to say that all deaf individuals have identical life experiences; while each individual's experiences are unique, there is certainly a lot of common ground between deaf individuals from the same geographic and cultural region.

For data collection itself, each team member played a substantial role. Dadi and Sumarni led most of the data collection: conversations, monologues, and the elicitation task. This decision served to minimize the influence of hearing research assistants on the signing varieties that the participants used (Fischer 2009); for example, participants might use oral or verbal cues more (to accommodate communication with a hearing researcher) and copy or follow the variant that the hearing researcher used rather than using their own signs (Lucas 2013; Nyst 2015). However, at times this was overruled. As our only male team member, Kanta had a vital role as interlocutor for male participants in order to manage local taboos against mixed-gender interactions, thus preventing uncomfortable situations.

Regarding the equipment, all recordings were made using two Canon Legria HF G26 cameras. All data were filmed in the participants' homes. The homesigners were recorded either with a deaf research assistant or with one or several of their hearing or deaf family members. In one case, a deaf homesigner was recorded talking to a deaf man from a neighboring village. The raw videos were originally saved in MTS format on an external hard drive, and after that, a converted copy in MP4 format was saved on a backup hard drive stored in Denpasar. In addition to the raw video recordings, metadata were documented with all relevant additional information about each recording and each participant.

The MP4 files were then uploaded onto the Tilburg Research Drive (a secure online location) in accordance with the Memorandum of Understanding, Memorandum of Agreement, and data transfer agreements that have been in place between our local partner Prof. Sri Satyawati at Udayana University, Bali, and Tilburg University. To ensure the data were backed up, project team member Josefina Safar downloaded copies of the new files onto another external hard drive.

All file names and metadata sheets were anonymized using participant IDs consisting of an alphanumeric combination instead of real names. The key file linking IDs and names was stored on a separate device. That being said, it is worth noting that full anonymity cannot be guaranteed given the visual nature of this language data (Crasborn 2010), especially when it comes to participants in small, rural communities. First, since facial expressions are part of the grammar of signed languages, it is crucial to note that the data in this corpus are non-anonymized video data. Second, since the targeted communities in this corpus are small, with sufficient local knowledge, participants might be identifiable purely by the rudimentary information provided about the number, gender, and age range of deaf participants as given in this paper.

3.3 Positionality and informed consent

It is important for researchers to reflect on their positionality concerning their participants: in this case, homesigners. Adjustment to the local cultural background with the awareness of one's positionality is necessary to build a healthy relationship with participants: this can result in higher ecological validity of the collected data (see also Kusters & Hou 2020). It is, then, essential to acknowledge that even though Dadi, Sumarni, and Kanta are native to Bengkala, they cannot identify completely with each participant because of different life experiences. In other words, Dadi, Sumarni, and Kanta have varying degrees of "insider" and "outsider" status respective to the participants (Dikyuva 2012: 338). They share aspects of geographical origins and cultural backgrounds with the homesigners; hence they could be considered an "insider" to a certain extent. At the same time, they could also be considered an "outsider" because of different living situations, especially with respect to living in a community where signed communication is used by many, diverse people on a daily basis (Bengkala) versus living in a community where most people do not sign (homesigners). Similarly, Satyawati can be considered an outsider as she is a hearing person who speaks Bahasa Indonesia but not Balinese, and at the same time an insider because she has experience with using the visual-gestural modality which give her the advantage of being able to communicate gesturally. We made a conscious effort to reflect on our positionality and respect the homesign used by the homesigners and the cultural ritual responsibilities of each family.

In addition to understanding one's positionality when conducting data collection, it is also essential to address the issue of informed consent when working with homesigners. Obtaining informed consent from all participants is an essential part of research ethics and has been discussed elaborately for the context of signing participants elsewhere (Crasborn 2010; Dikyuva 2012; Hochgesang & Palfreyman 2022). For deaf homesigners in Bali, obtaining written informed consent can be particularly challenging; first, the homesigners in our corpus have not gone to school and are illiterate. Second, they have not had input in a conventional (sign) language, making it difficult to obtain informed consent from them in a sign language that is not fully accessible to them. Occasionally, the written Indonesian consent forms had to be rephrased to spoken Balinese for hearing family members who were also recorded.

In this study, informed consent was obtained orally (spoken for hearing family members, signed for deaf homesigners) and written (Appendix B and Appendix C). Dadi and Sumarni explained to the participants using a simplified form of Kata Kolok mixed with local gestures. The local team made sure to explain the purposes of the project in as much detail as possible and offered opportunities for participants to ask clarification questions on multiple occasions. This procedure was conducted informally, with multiple visits prior to data collection to build rapport (see §3.1). After that, participants were asked to give their signatures on the paper document before the recording session began.

The next section will provide details about the social interactions of the homesigners in this study, and present factors that might influence the interaction within the homesigners.

4. Social lives and communicative experiences of Balinese homesigners

As mentioned in §2, Balinese people have substantial social networks due to interconnectivity between families through kinship and clans. Our semi-structured ethnographic interviews with participants and hearing family members captured the complexity of the social networks between homesigners in different social contexts (for more details see Kusters & Hou 2020: 565). Using these interviews, our observations and our contextual knowledge, we created a schematic diagram showing the social interaction patterns of all 14 participants (Figure 2). It is important to note that this figure represents a snapshot of the interaction patterns during data collection (See Appendix D for an overview of the Balinese homesigners who participated in this study, detailing ages, deaf family relations, and contact patterns with those relatives.).

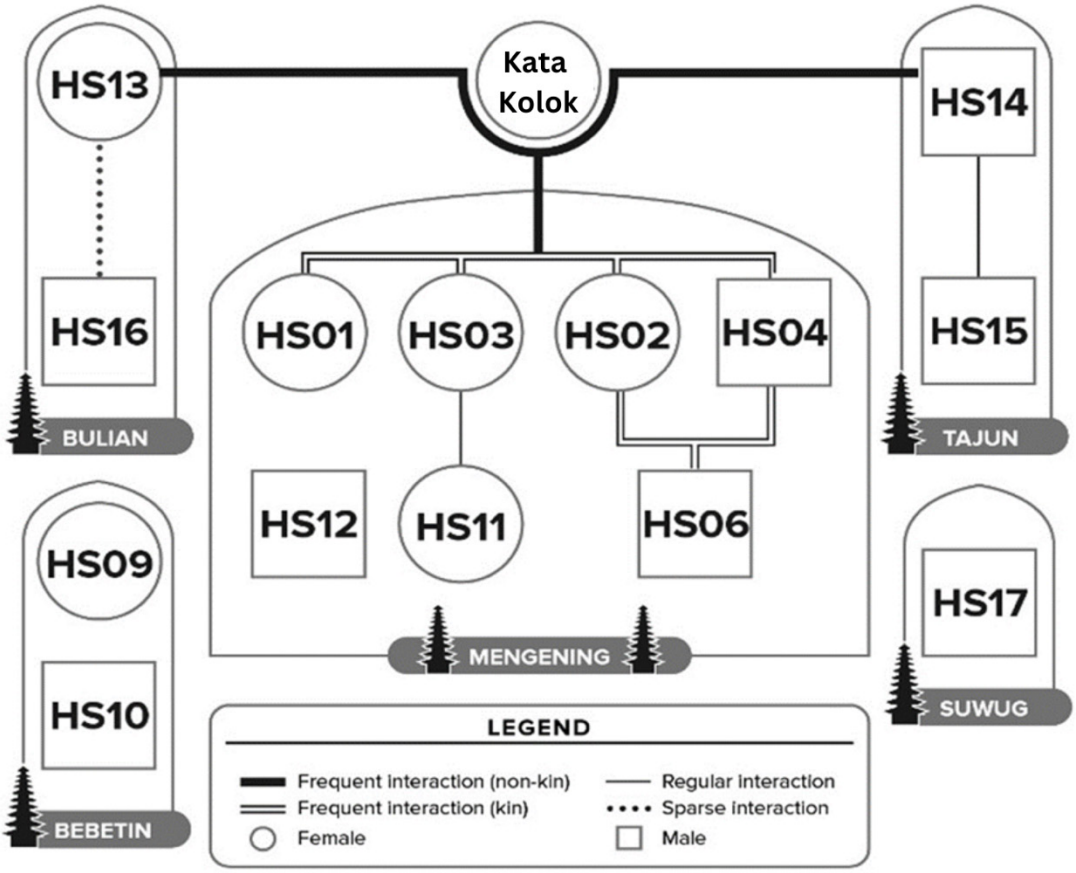

Figure 2. Social interaction patterns of all 14 homesigners recorded for the Balinese Homesign Corpus from the villages of Bebetin, Bulian, Suwug, Mengening, and Tajun. We also included the relation of homesigners to the Kata Kolok community in Bengkala. Note that this information relates to the Kata Kolok signing community as a whole rather than individual signers.

The Balinese Homesign Corpus data was gathered from homesign varieties that emerged in the same gestural context as Kata Kolok, which is why Kata Kolok is included in Figure 2. There are different types of connecting lines to represent types of interaction: thick lines indicate frequent interaction, thin lines show regular interaction, and dashed lines represent sparse interaction. Additionally, double lines indicate familial relationships. The absence of any lines between homesigners points to the absence of interactions, based on our information.

Marriage, employment status, gender, leisure activities, transportation, and geographical location play a significant role in shaping the social interactions of Balinese homesigners. Marriage is one of the means of social interaction relevant to the participants of this study. In Balinese culture, marriage typically entails patrilocal post-marital residence arrangement. This means that it is common for the wife to move to her husband's home location and become a member of the husband's village community. For instance, HS02, originally from the eastern part of Bali, became an integral part of the Mengening community after marrying HS04, and they had a deaf child, HS06. Similarly, the thick lines connecting HS13 with the Kata Kolok community indicate frequent interaction. In this case, the homesigner regularly interacted with Sumarni, one of the deaf research assistants who collected the data in this study. Sumarni's sister was married to one of HS13's neighbors. Again, marriage is not only a matter for the individuals concerned but also seen as a merg-

ing of two families, which can be portrayed by the famous Indonesian expression *gotong royong*[3]. Therefore, the families of HS13 and Sumarni will have interacted in the past. A similar pattern was observed for HS14, a neighbour of HS15 in Tajun. HS14 have contact with the Kata Kolok community through Dadi, who previously attended the same school as HS14's younger brother. Consequently, HS14 and Dadi will also have interacted in past interactions.

As patriarchal values are dominant in Balinese culture, men usually have more power due to their role as breadwinners and decision-makers in the household (Segara 2021). This is evident among the male homesigners (HS04, HS10, and HS15) who travel and work outside the home village and thus have more extensive social networks. Female homesigners often are engaged in domestic duties such as going to the market and religious duties, for example, preparing offerings. However, female homesigners may also have jobs – but usually these are concentrated more locally. For example, HS03 and HS11 are both from Mengening and not kin-related, but they foster a work relation as clove-pickers in the same local area.

Cultural norms and taboos also shape interaction patterns. Gender-related cultural norms concern the role of men and women in society, specifically that men are expected to be breadwinners and mobile and women are expected to stay home, taking care of the household and children. This leads to the fact that HS09 and HS10 from Bebetin do not interact despite being from the same village and, in fact, they seem to be unaware of each other's existence. In addition, there are cultural taboos around opposite-gender interaction in rural Bali. That means unmarried men and women who do not know each other usually avoid each other unless introduced. This seems to explain the lack of interaction between HS13 and HS16; even though they only live two minutes away from each other and essentially are in-law related, they do not interact.

In addition, leisure activities such as bingo-betting and cockfighting might play a role in the social interaction patterns of homesigners. Such activities are popular among locals but mainly attract men. HS15 from Tajun and HS16 from Bulian partake in these activities regularly.

Geographical conditions are also important. As explained in §3.1, the fieldwork area is typified by hills and mountains. Furthermore, participants' houses are usually located in remote areas. Due to the lack of public transportation, participants rely upon personal transport, commonly motorbikes. However, with low-income occupations, some participants do not have motorbikes. The others need to make budget-conscious choices so as to not waste their fuel by traveling. This seems to especially affect the social interaction patterns of HS17 from Suwug. It can be said that HS17's network is restricted to his family members exclusively. This may also apply to HS12 from Mengening, although anecdotal observation suggests his lack of interaction is mostly due to HS12's relatively young age (22) compared to the other participants (ranging between 27, 35, and 65 years old). This difference in age could lead to belonging to a different social circle altogether, and if HS12 were to interact with the other Mengening signers, the age gap might cause some degree of shyness.

It is worth noting that technology, that is, mobile phones and social media, facilitate contact between deaf individuals, including homesigners, in this study. For example, HS01 from Mengening uses video chatting via WhatsApp daily. In addition, HS10 and HS17 consume content on Facebook every day, as indicated in a conversation about current events at the time of data collection. Technology, then, might have played a role in broadening the network of homesigners, not only with other deaf homesigners or BISINDO signers from a different region but also with other (hearing) individuals in general.

This section highlighted social interaction patterns among Balinese homesigners and their interactions with the Kata Kolok signing community. These social dynamics are fluid, meaning that the (home)signers move in and out of each other's social networks at irregular intervals. Such interactions arise through marriages and (day) labor and are affected by social factors such as gender and related cultural norms. The availability of technology, specifically mobile phones, also plays a role in shaping the homesigners' social lives. The homesigners in this corpus display a wide range of diversity regarding their social networks, as seen in their unique social lives and interactions.

In the following section, further explanation of the data for The Balinese Homesign Corpus will be given.

[3] Roughly translated to "mutual and reciprocal assistance" (Bowen 1986), *gotong royong* is an important philosophy in Indonesian culture in general which encourages individuals to contribute and work together as a collective to achieve common goals.

5. Components of the emerging corpus: The Balinese Homesign Corpus

As mentioned in §3.1, the Balinese Homesign Corpus contains approximately 21 hours of video data collected from 13 adult homesigners across seven villages in the Buleleng regency. Refer to §3 for details on the data collection process and §2 for information about the surrounding social and cultural context. Table 1 provides an overview of the three types of data in the corpus.

Table 1. Summary of the Balinese Homesign Corpus data.

	Corpus		Duration
Elicited	Picture description task		03h 23m
	Balinese cultural practices		01h 46m
	Canary Row		02h 34m
		total	**07h 44m**
Semi-spontaneous	Conversation with family member or other familiar interaction partner		04h 16m
	Conversation with a deaf research assistant		04h 47m
	Conversation with local deaf individual		01h 18m
	Monologue		01h 24m
		total	11h 47m
Experimental	Reversibility		00h 54m
	Man and Tree		00h 46m
		total	01h 41m
TOTAL			21h 12m

The elicited data are grouped into three categories: (1) picture description task (Mudd et al. 2020b), (2) additional photos of Balinese cultural practices, and (3) Canary Row video stimuli. The picture description task from Mudd et al. (2020b) consists of 36 pictures of everyday objects, ranging from a camera, a mobile phone, and a rice cooker, to a dog, a chicken, and cows. Furthermore, as Balinese people are "molded by a system of traditional rules subordinated to religious beliefs" (Covarrubias & Vickers 2008: 237), we used 13 photos of Balinese cultural practices representing ceremonies and religious festive days, such as *Galungan*, *metatah*, and *otonan*[4]. These were presented on flash cards. The Canary Row video stimulus features clips of animated videos from Tweety Bird & Sylvester cartoons, presented on a laptop screen. In total, we used 8 short clips ranging from 40 to 60 seconds long. We asked participants to watch these, then retell the story. Since this stimulus set has previously been used for studies of other urban as well as rural sign languages and gesture studies (e.g., Nyst 2007; Casey & Emmorey 2009; Brentari & Coppola 2013), it offers a comparable data set for typological research.

The Canary Row video task proved challenging to collect. According to the instructions for the task, participants should watch the entire video and then retell the story, but instead, most of the participants shifted their attention and started signing while the video was still playing. Moreover, some did not want to undertake a task they perceived as "childish", and as a result, they did not fully engage.

[4] *Galungan* is a day to celebrate the "return" of family ancestors to greet the family in their home. *Metatah* is a ceremony marking entry into adulthood, symbolized by filing the teeth. *Otonan* is a birthday under the Balinese calendar; each family has a different way of calculating this.

Semi-spontaneous data mainly consists of participants in conversation with deaf or hearing family members or with one of our research assistants. Conversations with deaf research assistants occasionally overlap with semi-structured ethnographic interviews in which informative metadata about homesigners and social interaction were gathered (see Appendix A). While these recording sessions were planned, they mimicked everyday conversation, as there was no instruction to discuss any specific topic. Due to the nature of semi-spontaneous data collection, participants have more freedom, while researchers have limited control of the task. Therefore, the data is more naturalistic (Perniss 2015; Nyst 2015). Monologues were also collected from several participants to gather more personal information and trigger individual linguistic features, which might not be explicit when conversing with another interlocutor or doing the tasks. The monologues mainly focused on life stories, such as the homesigners' upbringing and family histories.

At least 60 minutes of the semi-spontaneous data in the Balinese Homesign Corpus has been annotated for specific studies (see, e.g., Safar & de Vos 2022; Kimmelman et al. 2024). A team of research assistants will continue to carry out the annotation process. With that being said, annotating and glossing homesign data presents considerable challenges, as these data was previously undocumented, with significant variation and low conventionalization. For example, many references (e.g., pointing for person and place reference) are so strongly tied to the particular context that they are hard to decode for anyone who is not intimately familiar with the local environment and the homesigner's social network. Additionally, since sign language research is still relatively recent, there has yet to be a standardized transcription system (Frishberg et al. 2012). Involving local team members who assisted with collecting the data through data coding and analysis can help overcome some of these translation and reference problems.

6. Conclusion

This paper presented the structure of, and data collection process for, the Balinese Homesign Corpus, which was led by a team of local research assistants. Communicative profiles of the homesigners vary substantially even though they come from a bounded geographic area and share cultural practices. Factors such as geography, cultural taboos, gender-specific norms, and technology have an impact on the homesigners' opportunities to engage in communication with other deaf people. The presence of several deaf people within a small geographic area (e.g., one village or two neighboring villages) does not guarantee contact between deaf individuals nor the formation of a signing community. Regardless, Balinese homesigners never live in complete isolation. They participate in locally typical occupations such as farming or clove-picking, as well as in religious ritual activities, during which they have variable levels of interaction with hearing or deaf people.

Lastly, we want to emphasize the value of locally-led data collection. In our case, the involvement of local and deaf research assistants allowed for a higher ecological validity of data, a larger pool of potential participants, and a more reliable annotation process. This methodological approach entails a number of particular challenges. In many rural signing communities, it can be difficult to identify suitable local team members who can dedicate their time to the project and who possess the necessary skills for it. Training local team members remotely (as we did for our project during the COVID-19 pandemic) can result in a number of practical and technical hurdles, such as internet connection, time difference, and misunderstandings due to the lack of face-to-face communication. In case community members are not literate, the data collection process needs to be designed accordingly (see Safar 2019). Using only a mutually intelligible sign language when working with deaf community members becomes both a resource and a goal of a locally-led data collection.

That said, the potential benefits of locally-led data collection are tremendous. When linguistic and cultural barriers are reduced, it is easier to identify and recruit participants, and to build a relationship of trust. The involvement of local community members boosts the ecological validity and quality of the data. From our experience, a mix of deaf and hearing, local and non-local researchers, that is also mixed gender, can serve as best practice, particularly when working in rural communities. Training and empowering local community members is also a way of "giving back to the communities" (Zeshan 2007), and of building local research capacity. Importantly, deaf team members can also serve as role models for homesigners, some of whom may not yet have encountered deaf people with a higher level of education who conduct research. It may also enhance the homesigners' awareness about the value and the uniqueness of their homesign (Sallabank 2013).

Moving forward, the potential of technology should be explored further. The advancement of smartphones, for exam-

ple, could be utilized as an alternative to the formal equipment (tripods and cameras) and thereby would be equally feasible to capture daily interactions with less intrusion. Methods like mobile ethnographic filmmaking (Moriarty 2020) could be particularly beneficial for documenting and analyzing homesigners' social interactions in more detail. Naturally, this approach would require active involvement from the participants themselves. Paired with dedicated corpus data, this might help us to obtain a clearer understanding of the role of social interaction in the emergence of homesign.

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Authors' Contribution Statement

Satyawati: Conceptualization; investigation; data curation; methodology; writing – original draft; writing – review & editing; project administration. **Ni Made Dadi Astini**: Investigation; methodology; project administration. **Ni Made Sumarni**: Investigation; project administration. **Ketut Kanta**: Investigation; project administration. **Josefina Safar**: Investigation; data curation; writing – original draft; writing – review & editing; supervision. **Hannah Lutzenberger**: Writing - review & editing; supervision. **Nick Palfreyman**: Writing - review & editing; supervision. **Connie de Vos**: Conceptualization; methodology; writing - original draft; writing - review & editing; supervision; project administration; funding acquisition.

Appendix A. Interview Protocol

QUESTIONNAIRE
SOCIAL INTERACTION PATTERNS OF BALINESE HOMESIGNERS

Participant code:……..

PART A DEAF COMMUNICATION PARTNERS

1. How many deaf individuals live in your village (including yourself)?
    a. 1-3
    b. 4-6
    c. 7 and up
2. What are their birthyears (approximately)?
    a. …
    b. …
    c. …
    d. …
    e. …
    f. …
    g. …
3. Do you talk with them?
    a. Yes, with …. [fill participant codes]
    b. No
    c. I did before, but I no longer do.
4. How often do you or did you interact with them?
    a. Daily
    b. Weekly
    c. A few times a year

d. I have only met them once or twice

5. On what occasions do you talk?
    a. Clan gatherings
    b. Hindu ceremonies
    c. Work
    d. Social
    e. Other, namely …
6. When you talk, how do you communicate?
    a. We use Indonesian Sign Language
    b. We use Kata Kolok
    c. We use our own signs
    d. Other, namely ……
7. When you talk, how well do you communicate?
    a. We can talk about everything
    b. We can talk about most things
    c. We do not understand each other well
8. What topics do you discuss?

……
……
……

PART B HEARING COMMUNICATION PARTNERS

9. Do you talk with hearing individuals?
10. Who is your preferred hearing communication partner?
    a. I have none.
    b. Yes, my friend(s), namely ……
    c. Yes, my relative(s), namely ……
11. How many hearing individuals do you talk to in total?
    a. 1-3
    b. 4-6
    c. 7 and up
12. Are they relatives or friends?
    a. …..friends

b. ……relatives

13. How often do you or did you interact with them?
    a. ……Daily
    b. …….Weekly
    c. ……..A few times a year

14. On what occasions do you talk?
    a. Clan gatherings
    b. Hindu ceremonies
    c. Work
    d. Social
    e. Other, namely……

15. When you talk, how do you communicate?
    a. We use Indonesian Sign Language
    b. We use Kata Kolok
    c. We use our own signs
    d. Other, namely……

16. When you talk, how well do you communicate?
    a. We can talk about everything
    b. We can talk about most things
    c. We do not understand each other well

17. What topics do you discuss?

……
……
……

Appendix B. Consent Form in Indonesian

FORMULIR PERSETUJUAN
PENUTUR BAHASA ISYARAT

Judul penelitian:
Kemunculan bahasa dalam interaksi sosial (ELISA)

Peneliti yang Bertanggung Jawab:
Dr. Connie de Vos

Pernyataan Partisipan
Tujuan dari penelitian telah dijelaskan kepada saya. Saya telah diberi kesempatan untuk bertanya mengenai penelitian. Saya mengerti bahwa saya dapat meminta berhenti kapanpun selama penelitian berlangsung. Apabila hal tersebut terjadi, maka peneliti wajib mengabulkannya. Saya mengerti bagaimana data dalam penelitian ini akan disimpan dan bagaimana data tersebut akan digunakan. Saya memberi persetujuan untuk berpartisipasi dalam penelitian ini.

Persetujuan untuk perekaman video/audio:

Saya setuju

Ya	**Tidak**
☐	☐ bahwa saya akan direkam dalam bentuk video/audio untuk penelitian ini.
☐	☐ rekaman ini akan disimpan dalam pusat data sesuai dengan peraturan dari Universitas Tilburg, dan rekaman ini akan disimpan untuk penelitian ilmiah.
☐	☐ untuk rekaman ini tersedia bagi peneliti lainnya, termasuk peneliti di luar Universitas Tilburg
☐	☐ rekaman ini dipertunjukkan atau digunakan selama presentasi ilmiah yang dalam hal ini, konteks dari rekaman akan selalu dijelaskan sebelumnya
☐	☐ rekaman ini dipertunjukkan/digunakan untuk kepentingan pendidikan yang dalam hal ini, konteks dari rekaman akan selalu dijelaskan sebelumnya.
☐	☐ rekaman ini didistribusikan melalui internet untuk keperluan penelitian dan pendidikan.
☐	☐ nama saya disebutkan dalam publikasi, dalam presentasi, dan/atau dalam situs yang berkaitan dengan peneli tian ini.

Komentar lainnya:

.....
.....

Nama partisipan: .....

Tempat/tanggal lahir partisipan: ……..…..…..…..…….

Tanda tangan: .....…. Tanggal dan Tempat: …...….…..……

Appendix C. Consent Form in English

CONSENT FORM
SIGN LANGUAGE USERS

Title of the research study:
Emergence of language in social interaction

Researcher responsible:
Dr. Connie de Vos

Statement of Participant

The aim of the research study has been outlined to me. I was given the opportunity to ask questions regarding the research study. I understand that I can stop at any point during the research study, should I wish to do so. I understand how the data of the research study will be stored and how they will be used. I consent to participating in this research study.

Consent for video/audio recordings:

Yes	**No**
☐	☐ that I am being recorded on video/audio for this study.
☐	☐ for these recordings to be stored in a database according to the rules of Tilburg University, and for these recordings to be kept for scientific study.
☐	☐ to making these recordings available to other researchers, including those outside Tilburg University.
☐	☐ for these recordings to be shown/used during scientific presentations, in which the context of the recording will always be explained
☐	☐ for these recordings to be shown/used during educational purposes, in which the context of the recording will always be explained
☐	☐ for these recordings to be distributed by internet for use in research and education
☐	☐ to be acknowledged by name in publications, at presentations, and/or at websites related to the study.

Other comments:

.....

Name of participant: .....

Date of birth of participant: ……

Signature: ..... Date:……

Appendix D. Overview of The Participants

No.	Signer ID	Location	Gender	Age	Deaf family members
1	HS01	Mengening	Female	28	2 siblings, 1 sister-in-law, 1 nephew
2	HS02	Mengening	Female	27	2 sister-in-law, 1 son
3	HS03	Mengening	Female	45	2 siblings, 1 sister-in-law, 1 nephew
4	HS04	Mengening	Male	35	2 siblings, 1 son
5	HS06	Mengening	Male	4	Mother, father
6	HS09	Bebetin	Female	55	None
7	HS10	Bebetin	Male	37	None
8	HS11	Mengening	Female	65	None
9	HS12	Mengening	Male	22	None
10	HS13	Bulian	Female	29	In-law, rarely in contact
11	HS14	Tajun	Male	35	Neighbors, regular contact
12	HS15	Tajun	Male	59	Neighbors, regular contact
13	HS16	Bulian	male	40	In-law, rarely in contact
14	HS17	Suwug	male	40	None

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