Iconic Handshape Preferences in Family Homesign Systems

Homesigners are deaf individuals who have not acquired a signed or spoken language and who innovate unique gesture systems to communicate with hearing friends and family ("communication partners").

▌ 1. Iconic Handshape Preferences in Sign Languages

One way to classify handshape is by iconic class, as either Handling (i.e., the hand represents a hand manipulating an item) or Object (i.e., the hand resembles the item). The Handling/Object distinction is robust and systematically used in a variety of ways, and previous work has shown that handshape preference in sign languages is used both lexically and grammatically. Padden et al. (2015) analyzed the productions of American Sign Language (ASL) signers and gesturers in the United States and found that both groups used Handling handshapes more frequently to describe actions and Object handshapes more frequently to describe static objects. Hunsicker and Goldin-Meadow (2013) found a child homesigner used handshape class (handling/object) to distinguish nouns and verbs at an early stage of development. The Handling/Object distinction is therefore used to mark a distinction between lexical classes (noun/verb), even in homesign gesture systems in which structured linguistic input is not available.

Within verbs, handshape class (i.e., Handling vs. Object) is used grammatically to mark agent versus no-agent contexts in Nicaraguan Sign Language, American Sign Language, Hong Kong Sign Language, British Sign Language, and Italian Sign Language (Benedicto and Brentari 2004; Goldin-Meadow et al. 2015; Brentari et al. 2015, 2020).

Regarding the current study of nouns, handshape type is often more uniform within a given language. For example, for lexical items referring to tools, Object handshapes are preferred in ASL, while Handling handshapes are preferred in New Zealand Sign Language (NZSL) (Padden et al. 2013). San Juan Quiahije Chatino Sign Language (CSL), an emerging sign language, has also demonstrated a Handling preference for tools (Hou 2018). When the term emerging sign languages is used here, it refers to a relatively new language (i.e., have existed for decades, rather than centuries or millennia), have a small number of initial users, and may exhibit more variety or higher rates of change (see Le Guen et al. 2020 for a more detailed definition of emerging sign languages). By describing a language as emerging, this is by no means implying any sort of hierarchy amongst languages and want to be clear that is not suggesting that emerging languages are in any way less than established languages (see Braithwaite 2020 for further discussion). Rather, this is making a distinction between emerging languages and languages with much longer histories, which as a result have different characteristics. Because here aa developmental perspective on language creation and language genesis is taken, using the term "emerging" in the same spirit as one characterizes the developing language of a child. That is, the language is in flux and, therefore, can reveal the capacities and processes that allow it to emerge, it can be proposed that the same as those that allow children to acquire the languages around them so effortlessly (Senghas and Coppola 2001; Senghas 2019).

Since differences across languages for Handling or Object preferences can be observed across languages, then presumably, during the emergence of a system, initial users of the system have the opportunity to somehow choose a handshape preference type. As this is likely not a conscious decision, the factors that go into settling on an iconic handshape preference need to be understood. However, not every sign language uses patterned iconicity as a strategy, for example, the Yucatec Mayan Sign Languages, a group of relatively young village sign languages (Safar and Petatillo Chan 2020). Since this systematic use of Handling/Object can be used in a variety of morphological and syntactic contrasts, and yet does not seem to be present in every sign language, patterned iconicity may not be a universal phenomenon early in language emergence, but instead may only become evident later. If there is indeed a universal cognitive bias towards Handling or Object, or if there are inherent properties of the items themselves, this may be

observed when a system is emerging (Brentari et al. 2012). In other words, if this type of iconic handshape preference is available early, people may observe it in homesign systems as well, but if it emerges later, people would only see it in established sign languages and not in homesign systems. In order to understand how iconic handshape preferences develop for labeling objects, cases other than signers of established sign languages must be checked, such as homesigners and hearing gesturers.

Differences in handshape preferences between signers and non-signers are also observed; in general, hearing silent gesturers (i.e., hearing individuals with no exposure to a sign language who are asked to label an item or describe an event without speaking) tend to use Handling handshapes (Padden et al. 2015). Additionally, hearing people silently gesturing do not always show the same preferences and patterns as signers from the same community. Even in childhood, signers become attuned to the contrast between Object and Handling Handshapes and in turn use strategies to make those distinctions, something that hearing gesturers do not do (Brentari et al. 2015). There are also differences in the complexity of handshapes between signers and gesturers. In Nicaragua, Italy, and the United States, signers of Italian Sign Language (LIS) and ASL show higher finger complexity in Object Handshapes and higher joint complexity for Handling Handshapes, while hearing Italian and American gesturers show the reverse pattern (Brentari et al. 2012, 2017). Clearly signers and non-signers use iconic handshape preferences differently; specifically, only signers use this handshape preference grammatically. In order to understand how handshape preferences for tool naming develop, the focus turns to the case of homesigners. Homesigners are an important place to look because they, like signers of community signed languages with longer histories, use the manual modality as their primary means of communication. However, homesigners have little to no exposure to an existing sign language and communicate almost exclusively with hearing gesturers in their daily lives.

2. How Do Homesigners Compare to Communication Partners and Signers?

Homesigners are deaf individuals who have not acquired a signed or spoken language and who innovate gesture systems to communicate with hearing friends and family members. The homesigners in the current study have not had regular contact with each other or with signers of Lengua de Señas Nicaragüense (NSL); each individual has created their own unique system to use with hearing friends and family members (referred to here as "communication partners") (Coppola and Newport 2005; Coppola 2002). Homesign systems more closely resemble sign languages than gestures produced by non-signers (Brentari et al. 2012; Horton et al. 2015). However, since homesigners do not form a linguistic or social group, there is not a large overlap for shared handshape forms even on the individual level, and many homesigners do not have a stable handshape form that they routinely use (Goldin-Meadow et al. 2015). Some trends can be found, such as homesigners using handshape type systematically to distinguish agentive and non-agentive events and additionally homesigners showing a slight preference for Handling Handshape for nominals (Goldin-Meadow et al. 2015). Hearing gesturers in general do not use Object and Handling Handshapes systematically like adult and child homesigners do, but both hearing gesturers and homesigners show a lot of between-subject variability (Brentari et al. 2015).

3. Why Look at Homesign to Understand Sign Language Emergence?

Studying homesign can help elucidate the emergence of certain structures found in sign languages, such as iconic handshape preference. Some sign languages form when a group of deaf individuals (e.g., homesigners) come together. NSL, for example, came to be after a school was founded allowing deaf homesigners to come together and start converging on a signing system (Senghas et al. 2005; Coppola 2020a). As time went on and more individuals started using the same system, it became more conventionalized, that is, members of the community started sharing similar forms and patterns. The emergence of NSL as an established language in a matter of decades supports the idea that language can be created, given some time and a receptive community of users (Brentari and Coppola 2013). The people that make up the community matter; in most cases like NSL, they must use the system as their primary form of communication in order for it to conventionalize. This is one major difference between sign languages and homesign; sign languages have been used as primary languages for many people over a long period of time, whereas homesign systems are used predominantly by one individual, which their communication partners use only with them. Even though communication partners use the homesigner's system to communicate with them, they do not use the system in the same way the homesigner uses it, so it may not become conventionalized (this is addressed in more detail in the next section; see also Coppola et al. 2013). Individual homesign family groups have the potential to conventionalize, but, if they do, it is much slower than NSL because of how centralized a homesign system is, given that all interactions involve the homesigner (Richie et al. 2014).

▍4. Is Conventionalization Possible in Homesign Systems?

Even though communication partners can use the homesigner's system, there is evidence that they do not always use the same patterns or the same degree of complexity, raising the question of whether homesign systems can become conventionalized. While Nicaraguan hearing gesturers produce gestures similar to some NSL signs, there is evidence of changes in form and meaning, likely mediated by homesigners; however, even over the course of 25 years, NSL still stabilized a lexicon much faster than homesign systems (Coppola 2020b). Homesigning children in Taiwan and the United States typically use similar gesture order, an ergative syntactic pattern in which patients and intransitive actors come before action gestures, while their parents do not follow their children's order and will sometimes put a transitive actor before action gestures, but this is not done consistently (Zheng and Goldin-Meadow 2002). In another group of American child homesigners, the mothers' gestures did not show the same structural regularities compared to their children's gestures; differences in each child's system is related more to the gestural input that the children provide for themselves and less due to any input their mothers may provide (Goldin-Meadow et al. 1984). It seems that communication partners are not enough; in order for conventionalization to happen more rapidly, homesigners must interact with other deaf people using a signing system. For example, in Nebaj, Guatemala, individual homesigners (i.e., those with no interaction with another deaf person) showed weak evidence for the use of patterned iconicity or a preferred handshape type when labeling items, while homesigners who used a shared system with either other deaf family members or deaf peers showed strong evidence for the use of patterned iconicity (Horton 2020).

Not only do communication partners not use the homesigner's system very well, they also do not appear to completely understand it sans context. Homesigners' mothers were significantly worse at comprehending homesign descriptions of vignettes from their deaf adult children than Spanish descriptions from their hearing adult children (Carrigan and Coppola 2017). This study also found that the younger a family member was when they first interacted with their deaf relative, the better their comprehension was; however, Deaf native ASL signers, who were not familiar with the homesign systems but did have lifelong experience perceiving and communicating in the visual modality, were actually the best at comprehending the homesign descriptions. This supports the idea that homesign systems are not completely transparent and that structure within a homesign system is not developed so that a homesigner can be understood by their communication partners, but instead perhaps represents how the homesigner mentally organizes concepts. This result is consistent with the idea that homesign systems are sufficiently similar to languages with longer histories and more developed structure that they also show hallmarks of a sensitive period for acquiring them among those who are exposed to them at different ages (Mayberry and Kluender 2018; Newport et al. 2001).

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