

Editorial

Emerging Sign Languages

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The emergence of sign language is of special interest because sign languages are the only human languages that can emerge *de novo* at any time. This means that the path they take is a good source of information about the emergence of language in human populations. There are probably hundreds of emerging sign languages around the world; however, we do not have enough information about them all, and this hampers the formation of robust generalizations. Linguists rarely have the chance to catch emerging sign languages in the act of being born, and small emerging sign languages are often quickly subsumed by larger national sign languages, which are used in education and formal interpreting.

This Special Issue presents rare data and analyses about eleven different emerging sign languages around the world. The articles deal with the following key topics of language emergence, with some overlap: (1) the relationship between language and culture of the larger society, including both ambient manual gestures and facial expressions; (2) the role of iconicity in the emergence of sign language; (3) the relationship between shared context in a small signing community and the degree of variation in the vocabulary; and (4) the vulnerability of budding sign languages. Spoken creole languages are also young, but are different from emerging sign languages, in that the speakers of pidgins from which creoles are assumed to have descended already had native languages. Topic number (5) in this collection is a comparison of features of creoles and of emerging sign languages.



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1. The Influence of Culture on Language Emergence

Yasamin Motamedi, Kathryn Montemurro, Natasha Abner, Molly Flaherty, Simon Kirby, and Susan Goldin-Meadow explored the basis of the action–object distinction in natural language, in the laboratory rather than in the field. Using the *silent gesture paradigm* with hearing non-signers, they ask whether the dyads of gesturers can innovate distinctions between objects and actions in an experimental communication task. They presented dyads with video scenes showing target objects being used by an actor in either typical or atypical contexts. The most significant distinctions found in the study were between typical and atypical situations. An example of a typical context would be using a camera to take a photograph; an atypical context would be using a camera to dig in the soil. In contrast to the typical context, where the object can be incorporated into the action (holding the hands in the shape of a camera as if to take a picture), an atypical context compels the participant to explicitly distinguish between an object and its action. The authors find that, despite having little experience in using gestures for a task such as this, dyads are more likely to gesture the object by itself, followed by a gesture for the action. Coders recorded whether the participants' used the base hand, whether the location of the gesture was on the body or in neutral space, the size of the gesture, and whether the gesture had repetitions in movement. Dyads formed gestural distinctions between objects and actions in their use of the base hand and with repetitions, but they did not consistently use locations on or around the body, nor did they vary the size of the gesture. The laboratory-produced forms show important similarities with the kinds of noun–verb distinctions described in naturally emerging languages such as Nicaraguan Sign Language (**Abner**

et al. 2019). This indicates that distinguishing between objects and actions is an essential feature of human communication (Supalla and Newport 1978), as has been shown for two emerging sign languages (Tkachman and Sandler 2013), and likely provides a basis for the emergence of nouns and verbs in nascent sign languages in general. Motamedi et al. also found convergence on forms within dyads (irrespective of iconicity), implicating cultural transmission as a relevant factor in the emergence of language.

Rabia Ergin's study contributes to a growing body of research studying how signers select and regularize gestural strategies for the purpose of building linguistic structure. Her field study also dealt with objects and actions, focusing on whether objects and actions are consistently differentiated in an emerging sign language used in Turkey. Five older and five younger Central Taurus Sign Language (CTSL) signers were shown two tasks: the first involved naming a photograph of an object in isolation; the second involved identifying the same object as used in an action by an actor. Ergin found that both cohorts preferred first depicting an action associated with the object, then describing the form and shape of the object. Older signers were more likely to use single signs or shorter strings when naming an object in isolation, compared with younger signers who used longer sign combinations and compounds in their responses.

When viewing a short video of an actor using objects in several atypical actions, such as dropping a pair of sunglasses, a hat, or a jacket (as opposed to putting them on), both cohorts chose one of two strategies. Either they ignored the actions in the array and referred only to the object, using object-based strategies such as shape and size, or they used object and action strategies together simultaneously. Ergin describes iconic strategies for actions and objects that become more consistently differentiated in signers of this emerging sign language. The patterning of responses within each of the signing cohorts shows not only that their strategies are shaped and regularized, but that their responses are consistent within their cohorts, a finding which is compatible with the cultural transmission factor supported by Motamedi et al., described above. Additionally, the younger cohort's preference for longer strings in their responses suggested to Ergin that they are more aware of the communicative pressures in the task, and acted to identify the target object separately from the other potentially confusing choices.

John B. Haviland presents a close analysis of the emergence of a grammatical marker in the language of a young, second-generation signer of a family sign language (which he dubbed Z), whose first cohort consisted of three deaf siblings, a hearing sibling, and a hearing niece. This child was the hearing son of the first deaf signer of Z. Haviland follows in detail an original conventionalized gestural emblem requesting attention (COME), which is ubiquitous among speakers of the spoken Tzotzil Mayan language of the surrounding community. The sign is first adopted in Z in the form of a more brief sign (HEY1), which calls for an interlocutor's visual attention. HEY1, in turn, is reduced in Z to HEY2, which signals that a signer is about to start a new signed utterance or to transition to a new conversational topic, when they have already secured their interlocutors' visual attention.

The bulk of the article is devoted to showing how Victor, the youngest signer of Z, beginning at 11 months, gradually acquires all three of these signs in order, while simultaneously acquiring both Z and Tzotzil. Victor's acquisition of pragmatic signs in Z, such as the one tracked in this study, demonstrates how the grammar of a language, including an emergent sign language, is built upon the practices of a language community and the basic parameters of local social life.

Olivier Le Guen tackles a topic that is much-studied and somewhat controversial in established sign languages: verb agreement. His study is based on his research on the emerging Yucatan Maya Sign Language. Agreement consists of moving the hands from a spatial locus established for the subject to that established for the object of a verbal sign. Early research suggested that this system takes time to develop in young sign languages, both in the Al-Sayyid Bedouin village sign language and even in the young national deaf community sign language, Israeli Sign Language (e.g., Padden et al. 2010). In contrast, Le Guen's study shows that the use of space in verb agreement does emerge early in

Yucatan Maya Sign Language; he attributes this to the gestures of the ambient culture described in his own earlier work. The article links cultural gestural patterns to sign language grammatical rules, and is commensurate with the view that culture contributes to the structure and emergence of language, a view put forth in the laboratory work of [Smith and Kirby \(2012\)](#), supported in [Meir and Sandler \(2020\)](#), and further supported by many articles in this Special Issue.

Anne-Marie Kocab, Anne Senghas, and Jennie Pyers turn to nonmanual signals. They ask whether Nicaraguan Sign Language (LSN) non-manual markers for WH-questions might have been based on the gestural and facial expression repertoire of hearing non-signers in the same culture. It has been claimed in the past, but without the benefit of empirical diachronic data, that linguistic facial expressions in sign languages derive from expressions that occur in general culture (e.g., [Janzen and Shaffer 2003](#)). It has also been rigorously demonstrated that particular linguistic facial expressions and head positions and their scope take time to emerge in young Israeli Sign Language ([Dachkovsky 2018](#)). Kocab et al.'s study in this collection is the first to systematically compare wh-question facial expressions of deaf signers with those of hearing non-signers in the same culture, and to track this signal's emergence in a young sign language, LSN. Using data collected from the first cohort of signers of LSN (the first to attend a recently established school for deaf children in Managua), they examined how the non-manual forms of the first cohort of signers compare with those of hearing non-signers of a comparable age. They then compared the first cohort of signers with second and third cohorts to track whether there are systematic changes in their non-manual productions. They report that although there is similarity in the types of non-manual markers used by hearing non-signers and the first cohort of LSN signers, the second and third cohort of signers exhibit greater selectivity with respect to which markers are used most frequently and which are used less frequently. Second and third cohorts of signers use significantly more brow furrows in their questions than hearing non-signers, and they make less use of head tilts. Furthermore, the authors report that the duration of these markers is longer in the later cohorts, implicating the scope of linguistic constituents as a determining factor. Unlike facial expressions used by hearing gesturers, the nonmanual forms of later cohorts of LSN signers possibly exhibit a narrowing of expressive options as well as an increase in frequency and duration of these forms.

Hannah Lutzenger, Roland Pfau, and Connie de Vos discuss the transition from gesture to sign in the history of the marker for negation in Kata Kolok, a rural language isolate from Bali. After outlining the typology of negation in both signed and spoken languages, and discussing the sociolinguistic place of Kata Kolok and its users, the authors present the results of their study, with data garnered from signers from generations III to V of the community. They concentrate on the balance between manual and non-manual signs in the expression of negation, both in Kata Kolok and more broadly. Kata Kolok signers negate extensively with both manual and nonmanual markers; however, the language does not favor the use of one over the other, unlike most sign languages in which negation has been discussed to date.

2. Iconicity

How does communication develop, starting from the invented system of one deaf person used with their hearing communication partners (CPs—a home sign situation), along a continuum to a conventionalized language? The emergence of sign language in a deaf individual in a hearing community is the topic of the article by **Madeline Quam, Diane Brentari, and Marie Coppola**. The authors focus on handshapes in iconic signs, and study both the signs of homesigning children and homesigning adults, as well as the comprehension of hearing CPs of both groups, and of unrelated hearing and deaf people. The researchers followed [Padden et al.'s \(2013\)](#) work on patterned iconicity in sign languages, which showed different types of iconic motivation underlying either handling or object forms in different sign languages. Quam et al. categorized iconic signs into

those that represent handling an object, those that represent the object itself, and those that represent both (typically, handling with one hand and object with the other). The authors looked for preferences according to category, and for conventionalization across homesigners and their CPs. Among other findings, the authors found that homesigners were more consistent than their CPs; that hearing family members who were exposed at a young age to the deaf homesigning family member understood the home signs better than those who were exposed older; but that American Sign Language signers, who were not CPs of the homesigners at all, understood the home signs best—a tantalizing result.

The article by **Diane Stoianov**, **Diná Souza da Silva**, **Jó Carlos Neves Freitas**, **Anderson Almeida-Silva**, and **Andrew Nevins** examines classifier constructions in Cena, a village sign language in Brazil, and compares them with those of Libras, the established national deaf community sign language. Classifier constructions exist in all known established sign languages. These constructions combine lexically specified handshapes, which classify entities in the world, with the manner of movement and path direction, which are iconic and often considered to be more gesture-like. Stoianov and colleagues address three questions, explaining how each is related to iconicity: (1) whether there is more variation/less conventionalization in the young Cena than in the established Libras, as reported for other sign languages (e.g., [Meir and Sandler 2020](#)), and as demonstrated by Mudd et al. in this collection; (2) whether the classifier handshapes are more complex in the younger language, only adhering to articulatory constraints at a later stage, as predicted by the findings of [Brentari et al. \(2012\)](#); and (3) whether the manner of movement and path direction elements in classifier constructions are overlaid simultaneously on one another or whether they are isolated into discrete sequential linguistic units, as reported for early Nicaraguan Sign Language ([Senghas et al. 2004](#)). The study's findings differ from expectations raised by other research, reminding us that sign languages can take different paths of emergence. The methodology provides a good model for statistical analyses and careful comparative work across sign languages.

3. Shared Context and Variability

Katie Mudd, **Connie de Vos**, and **Bart de Boer** investigate the question of whether social structure affects the degree of lexical variation in the emergence of sign language. Evidence from signing communities supports this, with smaller, more insular communities typically displaying a higher degree of lexical variation compared with larger, more dispersed, and diverse communities. These findings are in line with studies of spoken languages, where languages with fewer speakers have been shown to tolerate more lexical irregularity. They focus on how shared context, facilitating the use of iconic signs, permits the retention of lexical variation in the emergence of language. They present the results of their own computational agent-based model in detail, which encompasses both shared context and population size, to tease apart the contributions of the two factors. They take care to link the model to real-world examples. After discussing several possible improvements to the model, they conclude that it does provide support for the roles of the social factors of both population size and shared context in influencing lexical variability in a language.

4. Vulnerability of Emerging Sign Languages

Marah Jaraisy and **Rose Stamp** focus on the language contact situation between two sign languages in Kufr Qassem, Israel. At present, third-generation deaf signers in Kufr Qassem are exposed to the local sign language, Kufr Qassem Sign Language (KQSL), and the dominant sign language of the wider Israeli deaf community, Israeli Sign Language (ISL), both of which emerged around 90 years ago. The authors note that there are currently about 120 deaf Kufr Qassem signers in the community, and that the school system there adopted ISL from early on, social factors that could influence the outcome they report. Third- and fourth-generation deaf people in Kufr Qassem are also exposed to ISL in the wider deaf community, within the medical, sports, legal, and interpreting services, as well as on social media. Jaraisy and Stamp analyzed the signing of twelve deaf sign-

bilinguals from Kufr Qassem whilst engaging in a semi-spontaneous task in three language conditions: (1) with another bilingual signer, (2) with a monolingual KQSL signer, and (3) with a monolingual ISL signer. The results demonstrate that KQSL–ISL sign-bilinguals show a preference for ISL in all conditions, even when paired with a monolingual KQSL signer. They conclude that the degree of language shift in Kufr Qassem is considerable. KQSL may be endangered due to the risk of social and linguistic merger of the KQSL community with the larger surrounding ISL community.

5. Comparing Emerging Sign Languages and Creoles

John McWhorter compares what we know about the emergence of spoken and signed languages in order to find evidence for fundamental properties of language. Although no known spoken languages have emerged *de novo*, creole languages, whose first native speakers do not have access to native-speaker input, can profitably be viewed as cases of the re-emergence of language. Sign languages have been compared with creoles in structure ([Fischer 1978](#)); however, because the vast majority of signers have non-signing, hearing parents, sign languages have also been characterized as being re-creolized in every generation ([Newport 1981](#)).

McWhorter looks at six grammatical features that have been singled out in the literature on the transition from pidgin to creole languages, finding that three of them are also found in emerging sign languages, suggesting that these three are common to all emerging languages, regardless of modality.

Although many creoles exhibit SVO word order, McWhorter concludes that this may be heavily influenced by the source language, which, in many known instances, is an SVO European language. Emerging sign languages are less consistent, leading McWhorter to conclude that the jury is still out on this issue.

On the question of determiners, both definite and indefinite, McWhorter finds evidence for the earlier emergence of indefinites, which he suggests is due to the earlier emergence of overt marking for new information (indefinites) before the overt marking of old information (definites), although the data are admittedly somewhat sparse.

Subordinate clauses are found in all creoles and most have overt markers of syntactic complementation, although not all pidgins do. Although members of the very first generation of emerging sign languages do not always exhibit sentence embedding, it has been widely reported for most sign languages, suggesting that it emerges quickly and may be universal.

When it comes to tense and aspect, most creoles have markers for past, progressive, and future. Aspect marking is found in all but the youngest sign languages; however, tense marking is not, which leads McWhorter to conclude that aspect is more fundamental to human language.

Inflection is sparse in creole languages and slow to emerge when it does, whereas it emerges very early in sign languages. McWhorter follows the literature (e.g., [Aronoff et al. 2005](#)) in concluding that the early emergence of inflection in sign languages is a consequence of the modality.

Finally, McWhorter discusses semantic opacity in derivational morphology, and concludes that this is a function of language age and lexicalization, not of the language capacity itself.

6. Conclusions

Late in the 20th century, linguists began to suspect the possible value of sign language emergence for the study of human language in general. This Special Issue brings together research on a broader array of emergent phenomena in sign languages than has ever been assembled in one place before. The articles provide a rich spectrum of new data and new insights into emerging sign language phenomena, fulfilling the promise of that earlier suspicion.

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References

- Abner, Natasha, Molly Flaherty, Katelyn Stangl, Marie Coppola, Diane Brentari, and Susan Goldin-Meadow. 2019. The noun-verb distinction in established and emergent sign systems. *Language* 95: 230–67. [[CrossRef](#)]
- Aronoff, Mark, Irit Meir, and Wendy Sandler. 2005. The paradox of sign language morphology. *Language* 81: 301–44. [[CrossRef](#)] [[PubMed](#)]
- Brentari, Diane, Marie Coppola, Laura Mazzoni, and Susan Goldin-Meadow. 2012. When does a system become phonological? Handshape production in gesturers, signers, and homesigners. *Natural Language & Linguistic Theory* 30: 1–31.
- Dachkovsky, Svetlana. 2018. Grammaticalization of Intonation in Israeli Sign Language: From Information Structure to Relative Clause Relations. Ph.D. dissertation, University of Haifa, Haifa, Israel.
- Fischer, Susan D. 1978. Sign language and creoles. In *Understanding Language through Sign Language Research*. Edited by Patricia Siple. New York: Academic Press, pp. 309–31.
- Janzen, Terry, and Barbara Shaffer. 2003. Gesture as the substrate in ASL grammaticalization. In *Modality and Structure in Signed and Spoken Languages*. Edited by Richard P. Meier, Kearsy Cormier and David Quinto-Pozos. Cambridge: Cambridge University Press, pp. 199–223.
- Meir, Irit, and Wendy Sandler. 2020. Variation and conventionalization in young sign languages. In *Linguistic Contact, Continuity and Change in the Genesis of Modern Hebrew*. Edited by Edit Doron, Malka Rappaport Hovav, Yael Reshef and Moshe Taube. Amsterdam: John Benjamins, pp. 337–63.
- Newport, Elissa L. 1981. Constraints on Structure: Evidence from American Sign Language and Language Learning. In *Aspects of the Development of Competence*. Edited by W. Andrew Collins. Minnesota Symposia on Child Psychology Series. Hillsdale: Lawrence Erlbaum, vol. 14, pp. 93–124.
- Padden, Carol, Irit Meir, Mark Aronoff, and Wendy Sandler. 2010. The grammar of space in two new sign languages. In *Sign Languages: A Cambridge Survey*. Edited by Diane Brentari. New York: Cambridge University Press, pp. 573–95.
- Padden, Carol, Irit Meir, So-One Hwang, Ryan Lopic, Sharon Seegers, and Tory Sampson. 2013. Patterned iconicity in sign language lexicons. *Gesture* 13: 287–308. [[CrossRef](#)]
- Senghas, Anne, Sotaro Kita, and Asli Ozyürek. 2004. Children creating core properties of language: Evidence from an emerging sign language in Nicaragua. *Science* 305: 1779–82. [[CrossRef](#)] [[PubMed](#)]
- Smith, Kenny, and Simon Kirby. 2012. Compositionality and linguistic evolution. In *The Oxford Handbook of Compositionality*. Edited by Wolfram Hinzen, Edouard Machery and Markus Werning. Oxford: Oxford University Press, pp. 493–509. [[CrossRef](#)]
- Supalla, Ted, and Elissa Newport. 1978. How many seats in a chair? The derivation of nouns and verbs in American Sign Language. In *Understanding Language through Sign Language Research*. Edited by Patricia Siple. New York: Academic Press, pp. 91–132.
- Tkachman, Oksana, and Wendy Sandler. 2013. The noun-verb distinction in two young sign languages. *Gesture* 13: 252–86. [[CrossRef](#)]