

## **Child Homesigners Innovate Morphology: Evidence from Number Marking**

**Language:** English

This research presents evidence for systematic sublexical number marking by child homesigners and investigates its relation to number expressions in mature sign languages. Four deaf Nicaraguan child homesigners were filmed describing ten vignettes designed to elicit talk about number. To make it easier for the children to describe the vignettes, we gave them pictures displaying objects in the vignettes to which they could point. Children's gestures were coded according to Goldin-Meadow and Mylander (1984). Gestures about number were further classified according to the formational criteria identified by Coppola et al. (2013):

- (i) Finger Extensions (FEs): The homesigner extends his or her fingers to represent the quantity of the real world referent.
- (ii) Repeated Movements: The homesigner repeats the movement of his or her gesture to express information about number. Movement repetition was either discrete and easily segmented (Punctuated Movements, PMs) or quickly iterated without clear breaks between repetitions (Unpunctuated Movements, UMs).

Analysis of these form-based gesture classes reveals that FEs, PMs, and UMs exhibit systematic form-meaning patterns, suggesting that they are behaving like a rudimentary morphological system.

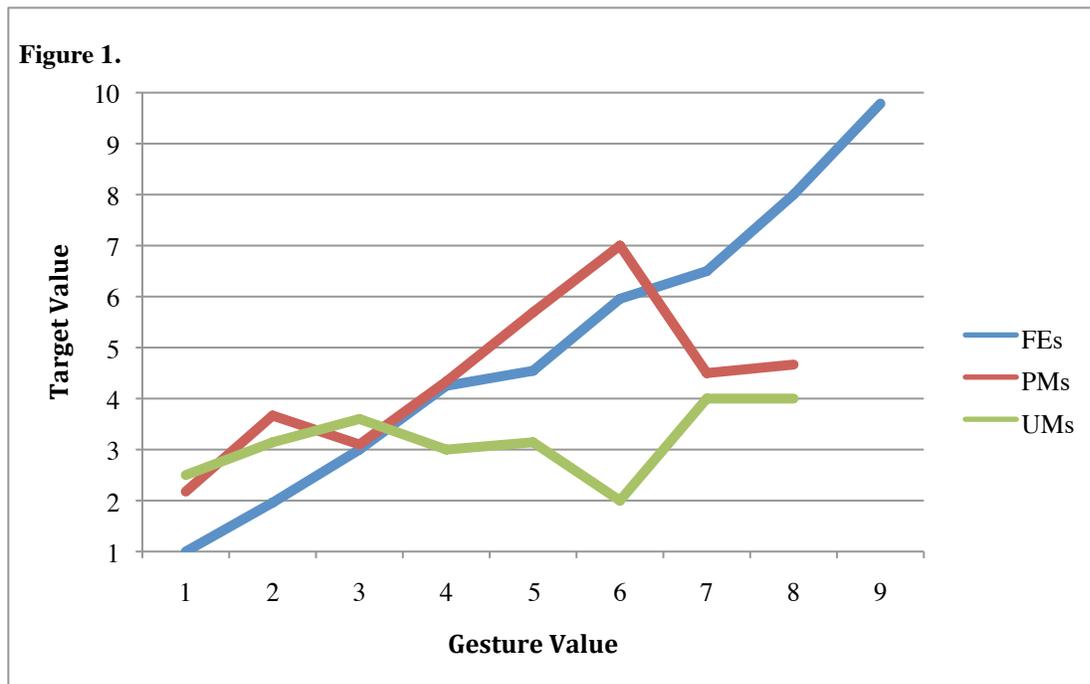
**FORM.** We asked whether the child homesigners produced FEs, PMs, and UMs in their iconic gestures, as do adult homesigners. Our static images facilitated the use of deictic gestures and provided an opportunity to ask whether the children's deictic gestures also incorporate number information. We found that children used FEs, PMs, and UMs with both deictic and iconic gestures (Table 1) suggesting that the children are treating these devices as abstract morphological forms for productive number inflection.

**MEANING.** We compared the gesture value—number of fingers extended (FEs) or repetitions produced (PMs, UMs)—with the target number value of the referent. We found that the child homesigners, like the adult homesigners studied by Coppola et al., distinguish cardinal (FEs, PMs) and non-cardinal (UMs) number devices. The gesture values of FEs and PMs systematically increase as the target number value increases (Fig.1), showing that they are closely tracking cardinal value. In contrast, the gesture value of UMs fails track the target number of objects. Cardinal and non-cardinal number tracking is also reflected in overall accuracy: FEs and PMs exhibit high overall accuracy (.67, .58, respectively) while UMs exhibit low overall accuracy (.09). This, too, characterizes FEs, PMs, and UMs as morphological inflections: they contribute their own fixed number meaning to the gestures with which they combine.

Evidence from both form and meaning supports the analysis of FEs, PMs, and UMs as components of a morphological system for number. These number devices bear much in common with those identified in established sign languages: FEs resemble conventional number signs and numeral incorporation (e.g., Ktejik 2013); PMs and UMs resemble the reduplication processes commonly used to mark number in spoken and signed languages (see Steinbach 2012 for a recent overview). The gestures of the child homesigners thus provide evidence for how the rudiments of such systems can develop even in the absence of language input.

	Deictic	Iconic
FEs	$POINT_{FE=2}^{\wedge}point_{FE=2}$ : Points to pairs of lily pads using a 2-handshape on each hand. (N=6)	$STRAW_{FE=4}$ : Four fingers are extended upright and bent representing straws in a glass. (N=8)
PMs	$POINT_{PM=3}$ : Three punctuated points to fallen cups on a table. (N=73)	$ICE-CREAM-CONE_{PM=6}$ : Six punctuated repetitions of a fist handshape in space. (N=9)
UMs	$POINT_{UM=4}$ : Four unpunctuated points to sheep in a pen. (N=5)	$TRUCK_{UM=5}$ : Five unpunctuated repetitions of the hands turning a steering wheel. (N=22)

**Table 1: Example gestures of the number-marking paradigm across all children; Ns represent the total gestures of that type (e.g., there were 6 deictic FEs total).**



- Coppola, M., Spaepen, E., Goldin-Meadow, S. (2013). Communicating about quantity without a language model: Number devices in homesign grammar. *Cognitive psychology* 67(1):1-25.
- Goldin-Meadow, S. and Mylander, C. (1984). *Gestural communication in deaf children: The effects and noneffects of parental input on early language development*. Monographs of the Society for Research in Child Development 49(3-4) No. 207.
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- Steinbach, M. (2012). Plurality. In R. Pfau, M. Steinbach, B. Woll (eds.) *Sign Language: An International Handbook*. 112-136.