Which came first—iconicity or symbolism?

Erica A. Cartmill[*1], Matt Cartmill[2], Kaye Brown[2], and Jacob G. Foster[1]

[*]Corresponding Author: ericac@iu.edu
[1]Cognitive Science, Indiana University, Bloomington, IN, USA
[2]Evolutionary Anthropology, Duke University, Durham, NC, USA

Iconicity has long played a privileged role in theories of language origins, purportedly helping to "cold start" language by making meanings more transparent. Theories proposing a gestural origin of language hinge on gesture's ability to illustrate things iconically (Armstrong et al. 1995, Corballis 2002, Zlatev 2008; Arbib 2012). So too do theories proposing that the earliest words were onomatopoetic (Fitch 2010). Iconicity provides an attractive solution to the problem of how to get language started. If a human ancestor invented a word for something, how would anyone know what it meant, especially if they didn't have other words to explain it? Iconicity solves this problem by proposing that meanings could be acted out, and that similarities between icon and referent provide insight into meaning. This is a seductive proposal, but it assumes that early iconic reference was (1) easy to produce and (2) easy to understand. There is some evidence that iconicity may function this way in adult humans, at least with contextual pragmatic support, as in experiments where someone guesses the meaning of a pantomime from a set of alternatives (e.g., Sibierska et al. 2022). But iconic reference is not easily understood by either young children or non-human apes—both of which have an easier time with conventional symbols. Importantly, symbol-like markings also precede iconic drawings in the archaeological record. All these sources suggest that symbolism (achievable via associative learning) preceded iconic reference in the evolution of language.

Although children gesture before they can speak (Bates et al. 1979), iconic gestures are rare and develop later than conventional gestures (Özçalişkan & Goldin-Meadow 2011). This is true even in homesign (manual systems created by deaf children with no access to language models), despite iconicity's being much more prevalent in homesign (Cartmill et al. 2017).

Like children, great apes are prolific gesturers, but iconicity is almost entirely absent from their natural communication (Call & Tomasello 2007). There are a few examples of pantomime-like gestures in language-trained or rehabilitant apes (Russon & Andrews 2011; Perlman & Gibbs 2013), but it is difficult to rule out the possibility that apes copy human movements without understanding the iconic mappings beneath them. Understanding icon-to-world mappings is not trivial. Judy DeLoache argues that in order to do this, children must represent an object simultaneously as both an object and as a representation of another object (DeLoache 1995). Studies suggest that children do not begin to master this ability until the ages of 3-4. Majid and Pyers (2017) found that children were not able to guess the meanings of iconic gestures until 4-5 years-old. Even children learning sign language can struggle with iconicity. Signing children do not master classifiers (which rely on iconic mapping) until 5-9 (Mayberry & Squires 2006).

Symbolic signs also precede iconic representation in another visual medium: drawing. Representational (iconic) art first appears in the archaeological record in connection with anatomically modern humans, about 45,000 years ago (Brumm et al. 2021). However, purely abstract symbolic markings were made much earlier by both Neandertals in Europe and early modern humans in Africa, at least 65,000 and 75,000 years ago respectively (Henshilwood et al. 2002; Hoffmann et al. 2018; Garcia-Diez 2022). Similar abstract "drawings" were made around 500,000 years ago by *Homo erectus* on Java (Joordens et al. 2015). We conclude from this that symbolic conventions surrounding the making of marks on surfaces were in place long before markings were used to represent iconically.

Great apes have little difficulty learning to use conventional referential symbols like those of Yerkish and ASL, but have considerable difficulty understanding representational drawings (Close & Call 2015; Martinet & Pelé 2021). One study found that apes and children under 3 were successful at finding hidden rewards when they were labeled with arbitrary symbols, but not when they were marked with iconic drawings (Tomasello et al. 1997). Children also struggle with 3D iconic representations. Children under 3 struggle to find hidden rewards when shown the location using a model of the room, but succeed when given verbal (symbolic, conventional) instructions (DeLoache & Burns 1993).

These very different lines of evidence—from studies of child development, from experiments on great apes, and from the archeological record—point to the same conclusion: the use and interpretation of iconic signs involves sophisticated cognitive abilities that appear relatively late, both in human development and in human evolution. All this evidence suggests that symbolic reference, not iconic representation, provided the framework for the earliest steps towards language.

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