

WHAT IS UNIQUE ABOUT THE EVOLUTION OF LANGUAGE COMPARED TO OTHER CULTURAL DOMAINS? AN EXPERIMENTAL STUDY OF LANGUAGE, TECHNOLOGY AND ART

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A comparative approach examining the differences and similarities between the evolution of language and cultural evolution in other human cultural domains (e.g. technology, art, social and political institutions) would help us understand how our cognitive biases interact with different human needs and affordances to produce the astonishing cultural diversity observed in our species. While between-species comparative studies of cultural evolution have deservedly received much attention (e.g. Horner, Whiten, Flynn & de Waal 2006), between-domain comparative studies within humans hardly exist. Instead, studies of cultural evolution in various human cultural domains have proceeded in parallel. Here we present an experimental approach to comparative cross-domain cultural evolution. Using a new paradigm, we find that evolutionary variables such as fidelity of transmission and selection are differentially affected by the *functions* inherent to three cultural domains: language, technology and art.

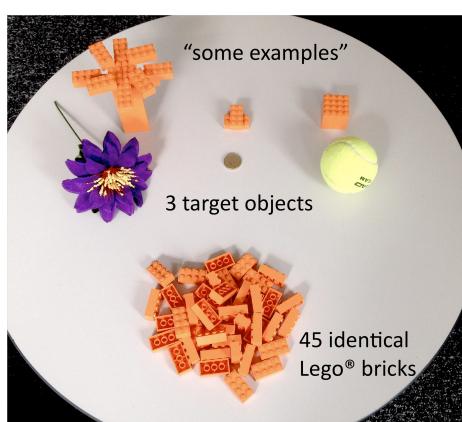


Figure 1.

We recruited 96 participants who were randomly assigned to the Art, Language, or Technology condition. Participants were presented with 45 identical 2x4 loose orange Lego bricks, a set of target objects, and an example Lego construction standing next to each object (see Fig. 1). Participants were then given five minutes to produce a new Lego construction for each object. In the Language condition, participants had to create signals communicate

the target objects to a partner participant in a naming game (a task similar to Garrod, Fay, Lee, Oberlander & MacLeod, 2007). In the Technology condition, they had to create three towers to raise the objects as high as possible off the table (a task similar to that in Caldwell & Millen, 2008). In the Art condition, they had to create three pieces of art inspired by the target objects. She was not given any instructions as to what to do with the examples. In each condition, we ran four chains of six generations. The examples shown to Generation i in a given chain were the constructions built by Generation $(i-1)$ in that chain; the initial generation received no examples.

The Lego constructions produced were coded for Height and Complexity (among others). Mutation was quantified by taking the average of three rater judgements of the dissimilarity between constructions of the same object in consecutive generations of the same chain. These values were submitted to repeated-measures ANOVAs, which returned significant effects of cultural domain on Complexity (linguistic signals were less complex than artworks or towers); Mutation (mutation was smallest in language and greatest in art); and Height (towers were taller than the linguistic or artistic constructions). These results clearly reflect different function-related evolutionary responses across domains: the artistic function encourages mutation, communication encourages fidelity of transmission and simpler signals, and the technological function favours innovation on previous ideas.

We believe this new cross-domain comparative approach complements existing lines of work by exploring how linguistic function specifically influences language evolution.

References

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