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# Palaeolithic Tool Standardisation Indicates Theory of Mind and Language

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## Abstract

Stone tools, being products of learning, offer us a continuous record of cultural transmission throughout human evolution. Reflected in this behaviour are the human perceptual abilities needed to transmit and acquire those skills. I hypothesised one way we would see cultural transmission in the lithic record is through the range of morphometric variability of a tool assemblage. Standardisation would reflect faithful replication and complex social learning abilities amongst a population; this does not mean that high variation reflects complex social learning abilities are not at play, as there are many sources that introduce variation in tools. Complex social learning is therefore necessary but not sufficient to produce a highly standardised stone tool assemblage. I tested this through a knapping experiment where novices replicated model handaxes on standardised porcelain blanks in simulated social learning environments. Results showed that higher fidelity social learning environments resulted in assemblages that were more standardised. The implications are that standardisation in the archaeological record can be read as indicating complex social learning abilities. Imitation and teaching necessitate theory of mind abilities, as an individual needs to process the intent and desire of another in order to map that behaviour to the production of a tool. Theory of mind is intimately correlated to language ability, and from child developmental studies we can draw what linguistic information would be present to scaffold and develop theory of mind abilities that in turn allow for complex social learning to take place. Standardisation, then, offers us an indication of complex social behaviour in ancient hominins, but also complex linguistic behaviour.

**Keywords:** Lithics, cultural transmission, theory of mind, language

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