

TALK

## **HOW IMITATION DRIVES INNOVATION: AN EXPERIMENTAL STUDY OF THE CULTURAL EVOLUTION OF A MULTI-DIMENSIONAL ARTEFACT**

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### **ABSTRACT**

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In an experiment in which participants had to place a dot exactly between two presented points we have shown that the precision decreases with the distance between the points.

Following this finding, it has become apparent that the way we think about the cultural equivalent of biological inheritance needs to be restructured to consider the question of variance proportionality. Our aim is to examine whether a parental variability-dependent model of cultural inheritance more accurately represents how human innovation and imitation works.

In order to apply these findings to wider contexts and to test their ecological validity, we devised a novel experimental paradigm that allows us to parametrize and monitor changes in multidimensional cultural artefacts within a standard transmission-chain experiment. Using an intuitive graphical user interface, participants are tasked with generating a model, based on one of three tasks. Here we focus on a task that resembles the above mentioned midpoint estimation generalized to multidimensional artefact. The model is then printed on a 3D printer, and its physical form can serve as a “cultural parent” of the next generation.

We revealed that most findings do generalize from 2 to 8 dimensions. The imitation error is proportional to parental variance. However, when there is no parental variance along some of the dimensions, participants do not imitate precisely, but explore the unexpressed dimensions.

Imitation - even when precision is the goal - can therefore generate unexpected novelty.