

# Convexity and expressivity in the simplicity–informativeness tradeoff

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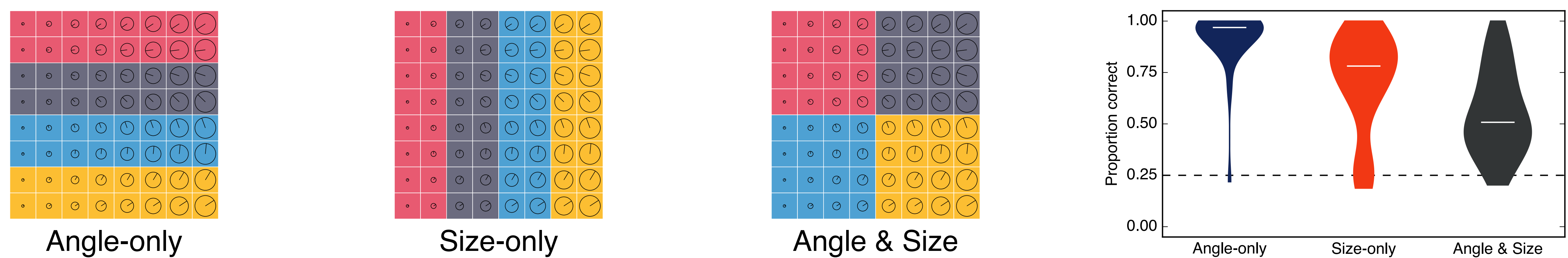
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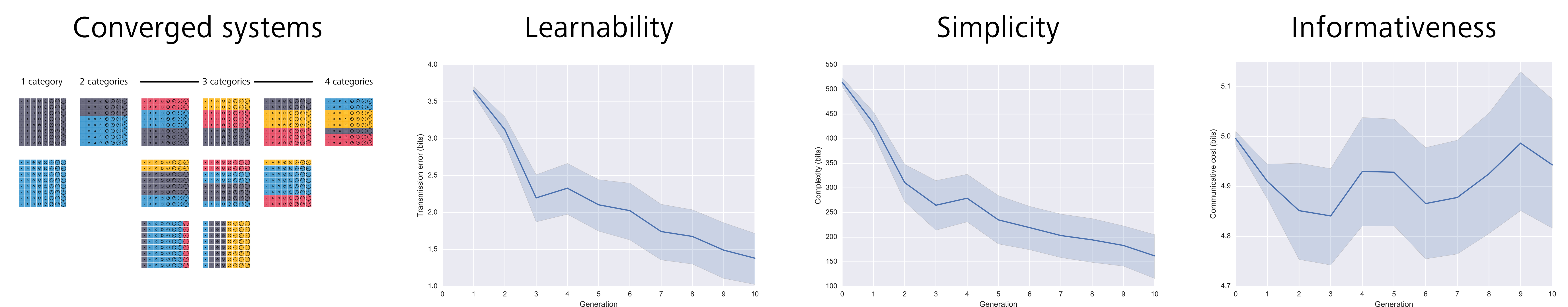
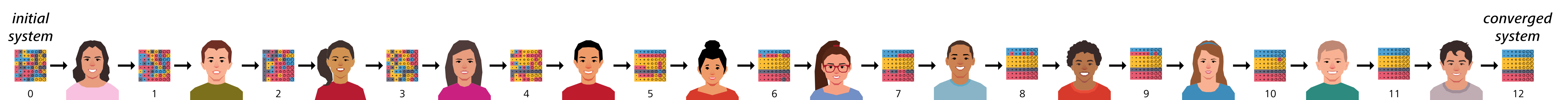
Language is shaped by pressures to be simple and informative



**Experiment 1: People find more informative category systems harder to learn**

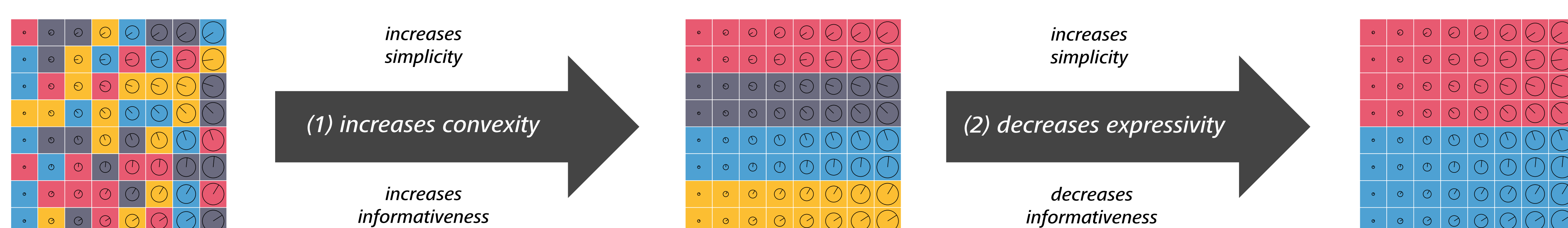


**Experiment 2: Iterated learning gives rise to increasingly simple category systems**



But these systems are not increasingly informative

Why? The pressure from learning alone has two consequences:



Crucially, convexity can be explained by a cognitive bias for simplicity, but it has the effect of increasing informativeness, obscuring the mechanism

Learning favours simplicity  $\Rightarrow$  Simplicity may be achieved by convexity  $\Rightarrow$  Convexity increases informativeness