Convexity and expressivity in the simplicity–informativeness tradeoff

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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:

1. Increases convexity
   - Increases simplicity
   - Increases informativeness

2. Decreases expressivity
   - Increases simplicity
   - Decreases informativeness

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 ⇒ Simplicity may be achieved by convexity ⇒ Convexity increases informativeness