Supplementary material:

People infer recursive visual concepts from just a few examples

Generating L-systems from the meta-grammar

The L-system axiom is always "F". The angle is sampled uniformly from $\{60, 90, 120\}$. The constrained F-rule is generated as follows. The start symbol produces three non-terminals: "X" (prefix), "Y" (body), and "Z" (middle). After each non-terminal grounds out as a string of terminals, the right-hand-side of the F-rule is defined by the resulting string concatenation $X||Y||Z||\text{reverse}(Y)||X$, where $||$ concatenates and reverse$(\cdot)$ reorders string. For instance, if $X = G$, $Y = -G+$, and $Z = F$, the rule F $\leftarrow$ G-G+F+G-G is produced. The G-rule is defined deterministically given the F-rule, so that all line segments ("F" and "G") grow at the same rate at each iteration.

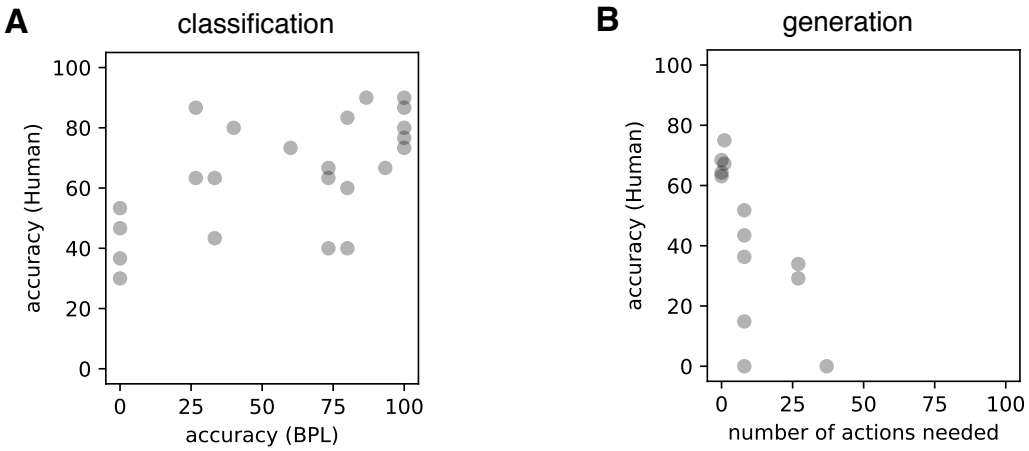

Figure S1: Item analysis for classification (A) and generation (B) tasks. Each point represents a different recursive visual concept. Classification accuracy is measured as performance in the six-way classification task, and generation accuracy is measured by marking exemplars as correct only if every individual segment is correct. The behavioral data is aggregated across incremental and block conditions. Item difficulty is best predicted by BPL with limited MCMC for classification (A) and the number of required actions to produce the correct exemplar for generation (B).

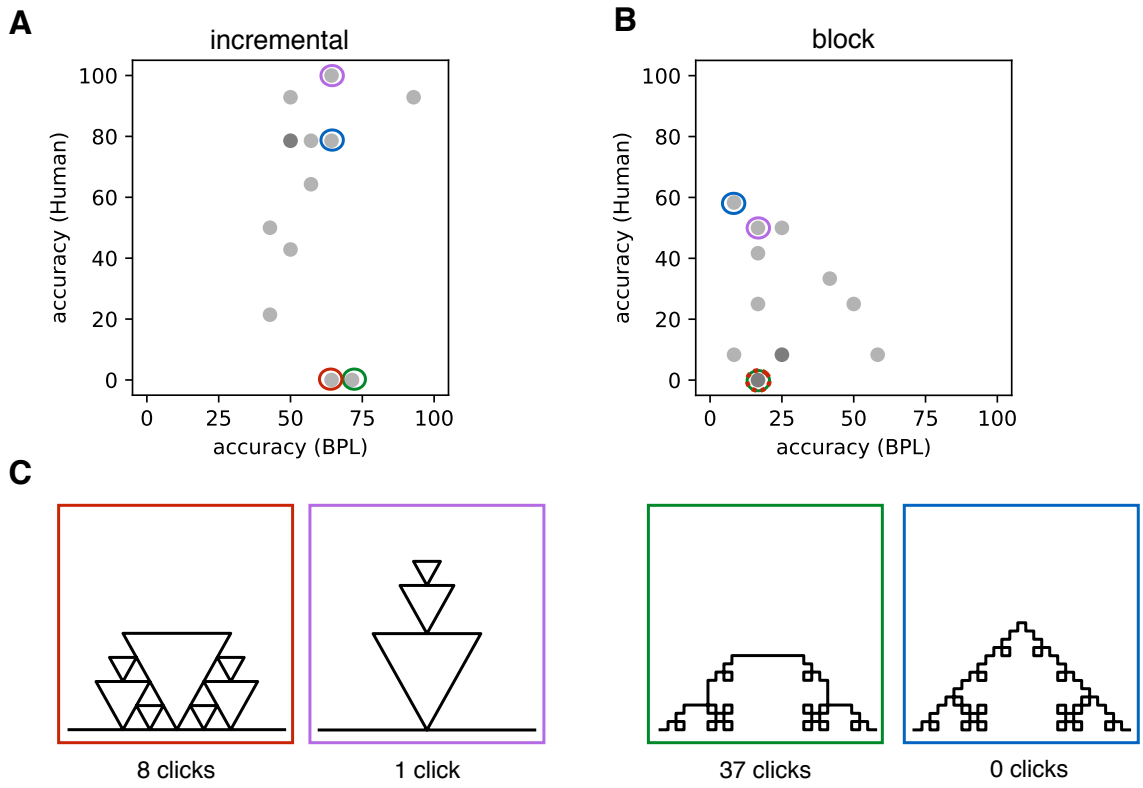

Figure S2: Item analysis for generation task. Each point represents one of the 13 different recursive visual concepts, both for the incremental group (A) and the block group (B). Accuracy is measured by marking exemplars as correct only if every individual segment is correct. Individual concepts (C) are shown expanded to depth 3, while the task was to generate a new example at depth 4. The concepts highlighted in red and purple have similar complexity for BPL with limited MCMC (same re-write rule but with different placements of 'F' and 'G' symbols), while the red one is far more difficult for participants to interpret. Likewise for the concepts highlighted in green and blue. However, the number of actions required to produce the correct exemplar (listed below each concept) does predict the difficulty of the item for participants, where exemplars that require fewer clicks are easier (see also Fig. S1B).