

# 1 The Exemplar Copy-And-Tweak Model

This model assumes that people represent categories as a collection of stored observations. When prompted to generate new examples, they copy and randomly tweak one of the stored examples. Thus, the model’s generation is a two-part process:

1. Select a source example from memory.
2. Generate an example that is similar-but-not-too-similar to the source.

More formally, let  $x$  be a  $j$ -exemplar by  $k$ -feature matrix, corresponding to the stored exemplars associated with the target category. The probability that a source example  $z$  is selected is uniform across all exemplars. After a source exemplar  $z$  is selected, similarity between candidate generation options  $y$  is computed:

$$s(y, z) = \exp(-c \sum_k |y_k - z_k| w_k) \quad (1)$$

Where  $c$  and  $w_k$  are the standard specificity and attention weights discussed elsewhere. The goal of the model is to generate an item that is similar but sufficiently tweaked from the source. Thus, probability a candidate stimulus will be generated is given by:

$$p(y|z) = \frac{\exp\{\theta \cdot s(y, z)\} I(s(y, z) \leq \tau)}{\sum_i \exp\{\theta \cdot s(y_i, z)\} I(s(y_i, z) \leq \tau)} \quad (2)$$

where  $\theta$  is a response determinism parameter,  $\tau$  is the similarity threshold, and  $I(\cdot)$  is the indicator function, which returns 1 when it is passed a true expression and 0 otherwise. So,  $I(s(y, z) \leq \tau)$  is 1 when the candidate exemplar  $y$  is tweaked enough. When  $\tau = 1$ , the threshold has no effect.

To obtain predictions not depending on a given source example, the model’s predictions can be aggregated over all possible sources:

$$p(y) = \sum_z p(z) p(y|z) \quad (3)$$