

Dissecting EXIT

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## Abstract

Kruschke's EXIT model (Kruschke, 2001b) has been very successful in explaining a variety of learning phenomena by means of selective attention. In particular, EXIT produces correlation effects (Le Pelley & McLaren, 2003), the inverse base rate effect (Kruschke, 1996; Medin & Edelson, 1988), inattention after blocking (Beesley & Le Pelley, 2011; Kruschke & Blair, 2000), differential cue use across the stimulus space (Aha & Goldstone, 1992) and conditional correlation effects (Uengoer, Lachnit, Lotz, Koenig, & Pearce, 2013). We dissect EXIT into its component mechanisms (error-driven learning, selective attention, attentional competition, rapid attention shifts and exemplar mediation of attention) and test whether simplified versions of EXIT can explain the same experimental results as the full model. Most phenomena can be explained by either rapid attention shifts or attentional competition, without the need for combining them as in EXIT. There is little evidence for exemplar mediation of attention when people learn linearly separable category structures (e.g. Kruschke & Blair, 2000; Le Pelley & McLaren, 2003); whether or not it is needed for non-linear categories depends on stimulus representation (Aha & Goldstone, 1992; Uengoer et al., 2013). On the whole, we believe that attentional competition—embodied in a model which we dub CompAct—offers the simplest explanation for the experimental results we examine.