Attentional Selection in the Unsupervised Generalized Context Model

Emmanuel Pothos
Swansea University

Todd Bailey
Cardiff University

Abstract: The distinction between supervised and unsupervised categorization has had a profound influence in related research. We consider a mechanism, attentional selection, possibly shared by models of supervised and unsupervised categorization. In supervised models such as the Generalized Context Model (GCM; Nosofsky, 1988), attentional selection emphasizes dimensions which are relevant for a taught classification. In a corresponding unsupervised version (the UGCM; Pothos & Bailey, 2009), attentional selection emphasizes stimulus dimensions which achieve the best separation of stimuli assigned to different categories. This approach unites the attentional mechanisms for supervised and unsupervised categorization, subject to the constraint that the assignment of stimuli to categories is exogenous in supervised categorization, but stimulus-driven in unsupervised categorization. In both cases, attentional selection is rational as it facilitates optimal category separation. We suggest that particular stimulus dimensions are attended if they make the target classification as intuitive as possible, whether categorization is supervised or unsupervised.