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Learning Novel Word and Novel Concepts in Media and E-media: the Power of Comparisons

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Abstract

Our purpose is to propose a general framework for novel words learning and conceptual learning that would promote efficient generalization (i.e., the ability to correctly recognize and apply the trained words and concepts to novel situations), for both traditional media (books) and more recent ones (e-media). Usually, teaching novel words and concepts is based on a limited number of pictures or on short animations which are supposed to illustrate a given concept (e.g., "malignant tumor"), phenomenon (e.g., tornado) or process (e.g., digestion). Later, generalization is tested with stimuli that differ from the training ones(s) along various dimensions. Successful generalization often means going beyond obvious and easily accessible perceptual appearances in favor of less accessible dimensions (e.g., taxonomically related items rather than perceptually or thematically related items, different kinds of tumors) (Chen & Klahr, 2011; Barnett & Ceci, 2002). The key problem is to provide learners (children or adults) with the information that will maximize correct generalization, either recognizing instances that really belong to the same category, phenomenon, as the one presented during the learning phase or correctly rejecting novel instances that do not belong to the same category.
In the present project, we propose that comparisons of several exemplars promote abstraction and generalization. We will argue that salience of the components of a picture is not always aligned with their conceptual relevance and that comparisons overcome irrelevant saliency. In books, children are often presented with only one picture that is supposed to illustrate a complex and/or dynamic concept. This raises the question of whether this prototypical representation sufficiently emphasizes the relevant characteristics of the targeted concept for them to be properly extracted by the learner. We will suggest that books should be well inspired to propose comparison situations rather than unique exemplars. The problem can be worse with transient pictures such as animation and simulation, especially when presented with a high level of realism. The pace of presentation can be too fast, for multiple sets of information delivered simultaneously, to be conceptually integrated. Here again, we will illustrate better animations and simulations, especially compared with what is often the case in e learning. In all cases, we will start with real exemplars from media. We will also provide experimental evidence that comparison situations are more efficient than "no comparison" conditions and will propose principles for efficient word and conceptual learning.