

# Binding Problem Solution?

Based on *Synaptic Self* by Joseph LeDoux (2002, pp. 310-311)  
With elaboration by Jay Gould 12/22/04

An example of the Binding Problem is as follows:  
If color, form, and motion are processed in separate visual areas of the brain, how/where is this information reassembled to create a single unified percept? (e.g. a red automobile moving to the right)? The following is a possible solution.

Hebbian plasticity is the strengthening of weak synaptic connections that are active *simultaneously* with strong synaptic connections—hence, e.g., the neural mechanism of *classical conditioning*.

This neuronal synchrony effect could also explain how different collections of neurons in different areas of the brain, which are simultaneously, i.e., *synchronously*, processing different aspects of a stimulus/event (e.g., the form, color, texture, and smell of a rose), become associated: In other words, how they become *bound together* so that we perceive whole objects rather than a collection of separate characteristics.

This would also be the mechanisms whereby the *recurrence* of one characteristic of an object or event could elicit the associated *recall* of the whole object or event, as well as our associated experiences with it in the past, and hence the *significance* then, now, and in the future of the object or event.