

## How is it Possible to Create a New Idea?

Although human creativity is a commonplace fact, it is not obvious how or why a material world governed by the causal laws of physics and chemistry can contain the possibility of novelty. The purpose of this contribution is to lay out some principles which, in conjunction, enable an information processing system to generate novelty. The key principles are representation, compositionality, layered processing, tentative action and negative feedback. A precise set of quantitative processing rules for how to manipulate the activation values of representations within computational systems that satisfy these principles will be shown. The processing rules identify the emergence of a novel idea in consciousness as a threshold phenomenon. No unique 'creative process' kicks in at the moment of insight. Instead, the creative insight is a side effect of processing as usual. The issue whether these principles and processing rules are necessary for creativity (and hence can be regarded as both a theory of human creativity and also as a design guide for artificially creative systems), sufficient (and hence can function as a design guide but may or may not be true of human creativity) or merely specify one type of creative system among many other possibilities will be discussed.