Concrete Mechanisms For Abstract Meaning

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The human brain can process abstract meaning. Words such as "love", "peace" and "not" can be understood without problems and even the abstract sense of concrete word sequences can be easily grasped ("She caught the sun"). However, whereas some concrete neuronal mechanisms have been offered for concrete word understanding, few such descriptions are available for aspects of abstract meaning (1-4). Accounts in terms of abstract semantic features seem to fail, because abstract meaning is 'explained' by abstract semantic features and it remains unclear how the latter are explainable (2). Distributional word co-occurrence approaches can map the degree of semantic relationship between symbols, but do not clarify the mechanisms for grasping abstract concepts. This talk will focus on typical examples of abstract symbolic meaning and ask whether established neuroscience principles of correlation learning can contribute to their explanation and learning (3).

Examples will range from abstract emotion words such as "joy" and "love", which have their natural expression in bodily action and in patterns of social-interactive behaviour, to abstract object- ("beauty") and action-related concepts ("to free"). Logical semantic concepts, such as negation and conjunction, will also be addressed. Instead of abstract statements, concrete neuronal circuit solutions will be offered for different abstraction mechanisms.

The proposed mechanisms for the "brain embodiment" of abstract meaning will be contrasted with one version of a classic symbolic model of concepts. The obvious conclusion is that the latter may profit from some concretisation and the former offer a pathway towards better understanding and indeed explanation of conceptual abstraction – although only experimental data can prove them right or wrong.

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