How brain structures and neuron circuits mechanistically underpin symbolic meaning has recently been elucidated by neuroimaging, neuropsychological and neurocomputational research. Modality-specific "embodied" mechanisms anchored in action and perception systems of the human brain appear to be relevant as are "disembodied" mech mechanisms in multimodal areas (1-3). Four semantic mechanisms are proposed and spelt out at the level of neuronal circuits:

1) referential semantics establishing links between symbols and the objects and actions they are used to speak about,
2) combinatorial semantics allowing the learning of symbolic meaning from context,
3) emotional-affective semantics establishing links between signs and internal states of the body, and
4) abstraction mechanisms generalizing over a range of instances of semantic meaning.

Referential, combinatorial, emotional-affective and abstract semantics are complementary mechanisms each necessary for processing meaning in mind and brain (1,4,5). A neuromechanistic framework is proposed in which these different semantic mechanisms are traced back to neuroanatomical structure and neurofunctional laws.

Suggested readings: