

## **Figurative language research on brain function and diseases: What should young researchers know?**

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Nonliteral expressions (like metaphors, proverbs, irony, sarcasm or metonymy) are an interesting linguistic phenomenon, since their comprehension process is a challenge for the brain. Many cognitive operations are involved before a reader's brain is able to identify that a sentence meaning is intended as metaphoric or ironic: there are for example processes identical to literal language (like word recognition), meaning selection processes, decision between figurative and literal meaning, suppression of the incorrect meaning, integration of context and general world knowledge, and theory of mind processes. During the last decade, knowledge on the functional neuroanatomy (that is: the brain regions involved in this comprehension process) has increased dramatically by the publication of more than 40 new fMRI studies. These studies stem from researchers from different backgrounds and disciplines. The most important research methods for neural correlates of figurative language are brain lesions studies and functional magnetic resonance imaging (fMRI). Brain lesion research on metaphors started in the 1960s, currently there are about 70 studies available. The number of fMRI studies is smaller, but faster increasing. I will present an updated meta-analysis of the fMRI studies. Current trends in this research line include right hemisphere involvement during metaphor and irony comprehension, the graded salience hypothesis (Giora, 1997), embodiment and motor language.

Like brain function studies, research on impairment of figurative language in psychiatric diseases is consistently increasing. Most studies exist for schizophrenia, autism and dementias. The idea of figurative language impairment in these diseases dates back even to the time of their definition. A popular theory was (and still is) that schizophrenia goes along with a cognitive bias towards literal interpretations of nonliteral expressions. More than 100 studies have investigated this phenomenon so far. Most studies point towards an impairment rather than an inability to understand nonliteral expressions in autism and schizophrenia. One problem and open research question is many studies did not include knowledge from linguistic research properly. I will present results of a systematic literature search on these studies with special focus on open research questions.