Sensorimotor semantics and 'disembodied' autism

Contemporary research in cognitive neuroscience suggests that many of the 'higher' functions of human cognition have their roots in the brain's sensory and motor cortices. This is particularly apparent in the way that the brain stores the meaning of words. Words describing actions ('kick'), visual objects ('cat'), smells ('cinnamon') and sounds ('bell') evoke brain activity in the very regions which are activated when people kick a ball, see a cat, smell a cake or hear a phone. It is suggested that the brain simulates these experiences in order to retrieve the meaning of words, but whether this sensorimotor activity is actually necessary for understanding words is unclear. As certain types of words are believed to draw on motor cortices for meaning, I conducted a range of fMRI, combined EEG-MEG and behavioural studies on individuals with autism spectrum conditions (ASC), a population characterised by structural and functional abnormalities of the motor system. Finding words with action- and emotion-related meaning to be 'disembodied' from cortical motor systems, these data are discussed as they relate to the way in which the typical brain processes the meaning of these concepts. These studies also shed light on the nature of autism itself, and we furthermore consider how fundamental movement deficits might derail cognitive and social development and give rise to some of the archetypal symptoms of autism.