

Primate Superior Temporal Sulcus (STS) cell responses and human adaptation to walking sequences and static human postures

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Static images of animate agents can convey whether they are moving or not. Images of humans in postures with arms and legs outstretched (articulated) often appear to be *implying* motion. Humans in postures with arms and legs near the body (standing) are not interpreted as moving. In monkey STS cells, we tested the association between sensitivity to movies of humans walking forwards and backwards, the sensitivity to the posture of static images of humans and the sensitivity to moving random dot patterns. There was a significant correlation between cell sensitivity to the posture of human figures and sensitivity to walking direction. Those cells that selectively responded to images implying motion were more likely to respond selectively to humans walking forwards (and vice versa); cells that selectively responded to images not implying motion were more likely to respond selectively to humans walking backwards (and vice versa). There was no significant correlation between cell sensitivity to the speed or direction of movement of random dot patterns and sensitivity to walking movies or sensitivity to static images of humans. Furthermore, we tested human subjects' perception of pairs of static images of humans in different postures, taken from a walking sequence, before and after adaptation to forward and backwards walking. After adaptation to forward walking, subjects were more likely to judge the static image pairs as walking backwards; after adaptation to backwards walking, subjects were more likely to judge the static image pairs as walking forwards. Together these results suggest that in monkey STS cells and humans forwards and backwards walking are opponently coded. STS cells coding walking direction could generate an implied motion signal from static images to be used for subsequent motion processing.