Social cognition

– imitation and attachment based strategy for emotion regulation

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What makes a person socially competent?
According to Marianne Sonnby-Borgström, PhD and senior lecturer at Malmö högskola, it´s a complex interaction between automatic imitation, emotion-related regulation and attachement-based strategies. In this article she presents an integrated perspective.

Social cognition research is currently a fast developing area involving cognitive psychology, neuropsychology, and developmental psychology as well as psychophysiological research. One main branch of this research deals with the central psychological constructs empathy and theory of mind. Research on social cognition supports the idea that humans are biologically prepared to catch the emotions and intentions of their conspecies, a capacity developed during hominid evolution. Human beings' environmental challenges consist to a great extent of managing interactions in social groups, as it is crucial for our adaptation to have information about the intentions and feelings of people around us. The prepared social capacity includes adaptive functions such as an ability to communicate emotionally, a tendency to affiliation and altruism as well as certain drawbacks, such as a sometimes dysfunctional inclination to conformism. Thus, the human brain seems to be specialised for social understanding and research in this area may shed light on some disorders related to social dysfunction, e.g. autism and psychopathic disturbances (Dieguez, 2005; Wolf, Gales, Shane, & Shane, 2001).

It is now well accepted that humans perceive other human beings and represent them in a very different way than they perceive and represent nonhuman objects. This view is supported by solid behavioural and brain imaging results that have demonstrated the existence of a special form of neurones that mirror the goal-directed actions of other living beings. The observer's mirror neurones are activated as if the observer intended to perform the observed action himself (Cochin, Barthelemy, Lejeune, Roux, & Martineau, 1998; Rizzolatti, Gallese, & Fongassi, 1995; Wolf et al., 2001). The mirror neurones' activation does not result in overtly imitative behaviour, since another brain region, the orbitofrontal cortex, is assumed to inhibit visible imitative movements (Williams, Whiten, Suddendorf, & Perrett, 2001). Perception of movements and motor responses seems to be linked right down at the neurobiological level, and this overlap can explain that we perceive other human beings as being similar to ourselves, a mechanism that may lead to understanding of the feelings, desires and intentions of other human beings.

Imitation as an automatic response

The tendency to imitate or react with a congruent facial motor response when looking at a facial expression is supported by many studies. When looking at smiling faces we tend to show EMG-activity in the zygomaticus (smiling) muscles and our corrugator (frowning) muscles are activated when looking at angry faces. These responses have been shown even when pictures of facial expressions have been presented subliminally (Dimberg, 1982; Dimberg, 1989; Dimberg, Thunberg, & Elmehed, 2000). This form of imitative, often invisible micro-expressions may be a result of the activation of the mirror neurones. The micro-motor responses can be processed as proprioceptive signals, which inform the observer about the bodily states related to different emotions (Capella, 1993). The magnitude of these imitative responses has been connected to differences in emotional understanding of others. Individuals with a high level of emotional empathy show stronger imitative responses than low-empathy individuals (Sonnby-Borgström, 2002; Sonnby-Borgström & Jönsson, 2004). Facial expressiveness has also been studied in boys with disruptive behaviour disorder (DBD). Boys with DBD are considered to be weak empathisers. Emotional film clips of faces were shown in an experiment. Facial EMG-responses of the zygomaticus and the corrugator muscles were measured. The DBD- boys responded with less corrugator responses towards angry faces than a control group (De Wied, van Boxtel, Zaalberg, Goudena, & Walter, 2006). Thus, there seem to be support for an automatic tendency to mimic other person's emotional expressions, which leads to synchronised feelings of the sender and the receiver (Sonnby-Borgström, 2002; Sonnby-Borgström, 2005; Sonnby-Borgström, Jönsson, & Svensson, 2003; Surraka, 1998). This primitive, automatic, phenomenon is labelled emotional contagion and is mainly dependent on bottom-up processing (Hatfield, Cacioppo, & Rapson, 1992). The spontaneous, automatic responses depend on stimulus, rather than on explicit memories and emotional regulatory processes. They are based on subcortical processing and on amygdala activation and operate without access to conscious awareness (LeDoux, 1996; Öhman, 1993).

Regulation of emotions

Social competence is, however, not only caused by differences in these primitive, automatic facial responses related to emotional contagion. Another ability involved in affective social competence is assumed to be emotion-related regulatory processes that depend on more elaborated cognitive information processing (Eisenberg, 2001). Emotion-related regulation have been defined as "the process of initiating, maintaining, modulating or changing the occurrence, intensity, or duration of internal feeling states, emotion-related physiological processes, and the behavioural concomitants of emotion" (Eisenberg, 2001, p. 120). Emotion regulation relies to a greater extent on top-down processes involving explicit memory and conscious information processing in which hippocampus is activated (LeDoux, 1996; Pally, 1998; Öhman, 1993).

Facial expressions can, in line with the different levels of processing described above, be elicited as a result of spontaneous, automatic processes and also as a result of more controlled and emotionally regulated processes. Subcortical structures and the facial motor nuclei (the 7th cranial nerve) in the brainstem are involved in the production of spontaneous expressions, whereas fibres originating in the primary motor cortex are responsible for producing more voluntarily controlled expressions. Facial expressions are thus supposed to be based on biologically prewired programs, but can also involve more cognitively controlled processing (Buck, 1994; Matsumoto & Lee, 1991; Plutchik, 2003; Rinn, 1984). The orbitofrontal region is assumed to be involved in the cortical control over subcortical facial displays (Rothbarth, Taylor, & Tucker, 1989; Tucker, 1992). EMG responses have been observed as a result of bottom up processes in experiments in which participants were exposed to different facial expressions at subliminal exposure times (Dimberg et al., 2000). However, EMG-responses have also been detected as a result of top-down processing in situations in which individuals have been instructed to imagine different emotional situations (Tassinary & Cacioppo, 2000).

Attachment based strategies

One hypothesis concerning the low-empathy individuals' weaker imitative responses is that they might use inhibition of facial expression as a strategy for emotion regulation. Different emotion regulation strategies are found in the different patterns of attachment. Individuals with a dismissing-avoidant pattern of attachment are characterised by a defensive strategy towards feelings of distress and anxiety. They keep away from getting close to other people and show an attitude of independence. At a conscious, reportable level they tend to inhibit anxiety, but under their tough and independent surface they are supposed to have a high level of anxiety (Fraley, Davis, & Shaver, 1998). An experiment was performed to investigate if patterns of attachment influence the modification of the imitative responses. Participants with different patterns of attachment were exposed to facial expression (happy and angry) and the EMG-responses (zygomaticus and corrugator) were measured (Sonnby-Borgström & Jönsson, 2004). The faces were exposed at successively longer exposure times representing gradually more emotionally regulated responses. In this experiment the dismissing-avoidant participants didn't show less corrugator responses (representing negative emotions) than the rest of the participants at rapid exposure times (65 ms). The remainder of the participants belonged to other attachment patterns, which are not characterised by inhibition of negative emotions. At longer exposure times (2500 ms), the dismissing-avoidant participants did not show any corrugator response to angry faces and had a tendency to an inverted zygomaticus response (smiling) towards the angry face, whereas the rest of the participants increased their imitative responses. Thus, the dismissing-avoidant participants showed significantly less imitative responses than the rest of the participants at longer exposure times, and further they scored lower on an emotional empathy test and on a self-report measurement of anxiety. The dismissing-avoidant individuals' tendency to inhibit their imitative responses may result in a decreased ability to feel emotional contagion and empathy. The above described research is based on the assumption that the emotional processing is hierarchically organised and that the early evoked somatosensory emotional responses can either be amplified and reach conscious awareness or inhibited and be prevented from being represented at a more conscious level.

In clinical practise autism and psychopathic disturbances are two different diagnoses connected to empathic dysfunction. Individuals with autism show difficulties in cognitive and motor empathy, but less clear difficulties in emotional empathy. In contrasts, individuals with psychopathic disturbances show clear impairment in emotional empathy (Blair, 2005). Preston and his colleagues (Preston & De Waal, 2002) argue that both emotional contagion and more advanced skills as cognitive empathy are sub-classes of the same super-ordinate phenomena. Whether emotional empathy and cognitive empathy depend on a one single neural network with components organised hierarchically, as proposed by Coricelli (Coricelli, 2005), or if different dysfunctions in empathic ability depend on completely separate and independent brain regions, is a question, which is not answered so far (Blair, 2005). Future research on social cognition will conceivably provide us with an answer to this question. Improved comprehension of the different roots of empathy may give us more adequate methods for treating and preventing empathy disorders.

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