

## **Understanding theory of mind based on evidence used in evolutionary psychology**

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Evolutionary psychology is concerned with the question how human psychological characteristics have developed through evolutionary processes, and what function they serve in natural and sexual selection processes, when individuals strive for survival and reproductive success. In this context, theory of mind is a very important social characteristic. It denotes an individual's ability to understand other's beliefs, feelings and knowledge, and based on this understanding, the ability to predict other's behaviour and also to deceive them (Clegg 2007). This essay will briefly sketch the types of evidence used in evolutionary psychology, before showing in more detail how the evidence promoted an understanding of function and evolution of theory of mind.

When focussing on the evolution of psychological characteristics, evolutionary psychology uses mainly archaeological and genetic evidence (Clegg 2007). Archaeological evidence includes bones of humans and animals, but also artefacts produced by prehistoric humans, for example their paintings, weapons or tools. These material and symbolic data provide information about physical characteristics, behaviour and lifestyle of our ancestors. Genetic evidence is based on comparisons of genes from humans and other primates, for example great apes, chimpanzees and monkeys. Genetic analyses allows backward calculations on the differentiation of primates into hominines (humans and great apes) and monkeys, which is estimated to have occurred about 20 million years ago. Furthermore, behavioural data from studies on non-human primates provide evidence about similarities and differences in behaviour and cognitive abilities between human and non-human primates.

In order to understand the functions of psychological characteristics, evolutionary psychology relies predominantly on behavioural data from studies of modern human populations and hunter-gatherer cultures (Clegg 2007). Research on modern humans includes special populations, for example persons with autism or brain damage, and children with typical or atypical development. Hunter-gatherer cultures are present-day cultures which lead the typical lifestyle of our ancestors: Living in small groups and wandering around instead of staying in one place all of the time, hunting for food and gathering fruit. Examples include the Mbuti Pygmies from Zaire and the !Kung San of the Kalahari desert. Finally, evolutionary psychology considers the universality of human characteristics across cultures, which may point to a genetic component of the characteristic. Universality is understood in a statistical sense, i.e. an occurrence more often than would be expected by chance (Brown 1991 as cited in Clegg 2007).

Many of these types of evidence permit valuable insights into theory of mind. Studies on modern human populations, especially on children and persons with autism, use variations of the well-known "Maxi test" or the "Sally-Anne test", to assess the ability to understand another individual's different beliefs or knowledge about a situation, and the ability to deceive (Clegg 2007; Wimmer and Perner 1983 as cited in Clegg 2007). Typically developing children are successful in tasks of this type by the age of around 6 years or even younger, if the tests are well adapted to their cognitive and language abilities, whereas children with autism perform systematically less well (Clegg 2007). As autism is associated with significant impairments in building and maintaining social relationships, it is concluded that theory of mind abilities play an important role in social interactions, for example in cooperating with others, resolution of interpersonal conflicts or when trying to persuade or deceive others (Baron-Cohen 1999 as cited in Clegg 2007). Cross-cultural studies on children from westernized and hunter-gatherer cultures found differences in ages and task performance, but generally consistent developmental patterns for theory of mind abilities (Wellmann et al. 2001 as cited in Clegg 2007). This evidence for universality

points to a characteristic with a genetic component which may have adapted through evolutionary processes (Clegg 2007).

Further understanding of the evolution of theory of mind abilities has been gained through archaeological evidence, from which we know that, since the appearance of homo sapiens around 200,000 years ago, there have been no major evolutionary changes in the human species. So the large brain relative to body size, which is typical for modern humans, must have been present at that time already. According to the social brain hypothesis, the increase in relative brain size in humans in comparison to other primates has occurred because humans had to resolve increasingly complex social problems. Theory of mind, together with altruism, may have evolved as a consequence of this need (Barrett et al. 2002 as cited in Clegg 2007). But when exactly might a full theory of mind have been present in the human species? Findings of prehistoric art and artefacts of burial ceremonies dating from 30,000 to 40,000 years ago indicate this presence, as these are seen as evidence for creative and religious behaviours consistent only with a fully developed theory of mind (Baron-Cohen 1999 as cited in Clegg 2007)

On the other hand, studies on non-human primates provide evidence that theory of mind abilities are not only present in humans, but also in apes. For example, apes use deception: They are able to inhibit their gaze to keep the existence of food secret from another ape (Whiten 1997 as cited in Clegg, 2007). Although research results are sometimes difficult to interpret, they show that apes such as chimpanzees possess at least partial theory of mind abilities (Clegg 2007). This accounts for the possibility that early signs of theory of mind date back as far as 6 million years ago, when the hominine species developed (Mithen 1998 as cited in Clegg 2007).

To summarize, interpreting the evidence from an evolutionary psychology perspective suggests that theory of mind is universal and may rely on a genetic component. The evidence also shows that theory of mind consists of different sub-components, which may have evolved gradually. The social difficulties of persons with impairments in theory of mind abilities, for example persons with autism, point to their ultimate, adaptive function: They enable the individual to better cope in social situations when interacting with others. Consequently, theory of mind abilities may have been promoted during evolution by increasing individual survival chances and reproductive success.

## **References**

Clegg, H. (2007). Evolutionary Psychology. In D. Miell, A. Phoenix, and K. Thomas (Eds.), *Mapping Psychology* (2<sup>nd</sup> ed., pp. 105-60). Milton Keynes: The Open University