The Role of Theory of Mind and Deontic Reasoning in the Evolution of Deception

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Abstract

Modern Darwinist perspective enables to deal with the study of several human phenomena, one of which is deception, that we define as a behaviour unfolded with the deliberate intention of producing or sustaining a state of ignorance or false belief in another person. Evolutionary Psychology, an emerging area inside Cognitive Science, represents a promising conceptual approach to the study of deception. According to it, knowledge on human mind can be improved by understanding the processes which, during evolution, shaped its architecture. This work traces back to the Evolutionary Psychology arguments (for a review see Cosmides & Tooby, 1987; Barkow, Cosmides & Tooby, 1992; Buss, 1995; 1999) and develops the hypothesis that deception is a behaviour underpinned by two psychological mechanisms that evolved in response to problems posed by group living: the theory of mind and deontic reasoning.

1. Basic Assumptions of Evolutionary Psychology

According to evolutionary psychologists, it is possible to increase our knowledge of the human mind through an understanding of the processes that in the course of phylogenesis have modelled its architecture. This in fact means to construct theories regarding the selective pressures that have recurringly acted throughout the history of our evolution, so as to be able to formulate hypotheses for the architecture of the human mind, considering it as the result of those pressures. The selective pressures that have accompanied our evolution can be seen as adaptive problems, that favourably select those individuals that have developed mechanisms capable of generating responses to them. Among the adaptive problems that have been necessary to confront are, for example, the choice of sexual partner, communication with other members of the group, the defence of progeny against predators and the recognition of deception in social exchanges.

A central assumption of Evolutionary Psychology is that there is a universal human nature to be sought among the body of psychological mechanisms that shape our cognitive architecture and that these mechanisms constitute the basis of our behaviour. One of the goals pursued by Evolutionary Psychology is to furnish a functional explanation of these psychological mechanisms, by seeking to comprehend the selective pressures encountered by our ancestors, to which they are a response. By uniting Cognitive Psychology with Evolutionary Biology, Evolutionary Psychology attempts to demonstrate that the human mind is a complex system composed of a finite number of mechanisms, each of which having been shaped by natural selection to favour individual survival through the exercise of a particular function (Symons, 1992). Evolutionary Psychology however goes well beyond the notion of the innate and acquired patrimonies as reciprocally irreducible ontogenetic dimensions, to focus its particular attention on the complex causal relations extant between selective pressures and psychological mechanisms, and between these latter and behaviour.

What the evolutionary psychologists maintain is that the few tens of thousands of years which have passed since the appearance of man in his modern form, which appearance has been traced to a time between 100 and 200 thousand years ago (Horai, Hayasaka, Kondo et al., 1995), are almost irrelevant with respect to the more than two million years that individuals of genus *Homo* lived with a social organization and a lifestyle very different from those current today. Consequently, the hypothesis can be advanced that it is not possible to fully comprehend the nature of any given psychological mechanism without referring to the type of life the individuals of our genus conducted during the Pleistocene, the life of hunter-gatherers of the savannah and the prairie.

Since human mind is the product of a slow process, it would seem reasonable to exclude the possibility of its having evolved in response to the conditions of life and environment that man has had to confront in recent times. In fact, these conditions represent only a fraction of our evolutionary history and the conditions prevailing during the course of our phylogenesis were very different.

Regarding social organization, for example, we know that genus *Homo* spent more than 99% of his evolution in groups made up of a number of members varying from 30-50 to 200-300. These groups of individuals, organized into true bands of hunter-gatherers, were the prevalent type of social organization until about 10,000 years ago (well after the appearance of modern man) when we see the beginnings of the progressive propagation of a new relationship with the environment. This new relationship consolidated itself only within the last 5,000 years (Diamond, 1997), leading to an economy based on agriculture and animal raising, and to a social organization evermore characterized by the creation of stable and populous urban nuclei.

These considerations aid in understanding the reasons why we cannot expect our minds to have evolved mechanisms capable of confronting the problems which arose following the appearance of agriculture, let alone those arising as a consequence of industrialization, and they clearly signal the necessity for research into the style of life and the selective pressures that accompanied the evolution of our species for over two million years.

2. Deception in the Perspective of Evolutionary Psychology

Evolutionary Psychology suggests that a series of psychological mechanisms underpins human behaviour. Since this is valid as well for deception, a satisfactory explanation of this phenomenon must be able to generate falsifiable hypotheses as to nature of the psychological mechanisms at its base. As has been previously explained, psychological mechanisms can be interpreted as structures that evolved to resolve the adaptive problems faced by our ancestral forebears. As such, in order to identify the mechanisms underpinning deception we must first ask under what selective pressures they evolved. In other words, we must single out the adaptive problem to which deception -or more precisely the mechanisms permitting its actuation- is a response.

Our hypothesis is twofold: (a), that deception is a behaviour underpinned by two psychological mechanisms that evolved in response to problems posed by group living, the theory of mind and deontic reasoning; and (b), that deception is a behaviour able to confront one specific problem among others: the problem of the constraints imposed by the group on the individual. This constraints limit individual possibilities of achieving personal goals. The hypothesis thus presented underscores how the correct interpretation of deception behaviour can emerge clearly only through consideration of the complex social organization that characterized the evolutionary history of genus *Homo* (Adenzato, 1998; Adenzato & Ardito, 1998; Adenzato & Bara, 1999).

The hypothesis that some aspects of human cognitive architecture can have evolved in response to problems posed by sociality has been yet authoritatively sustained by other researchers. According to the hypothesis of the *Social Origin of the Mind*, the increase in cerebral mass and the consequent development of cognitive capacity are adaptive traits that primates evolved in response to the complexities of social life. At the base of this hypothesis, advanced in its most explicit form by Humphrey (1976), but already delineated years before by Chance and Mead (1953) and Jolly (1966), is the observation that the social world, for the challenges it poses to the individual, is more complex than the physical one, which instead is normally more predictable. During the course of evolution there would therefore have been stronger selective pressures for mechanisms capable of resolving problems posed by group living than for those operating in response to the physical world.

One of the most interesting developments of the hypothesis of the social organization of intelligence is the concept of "Machiavellian intelligence", proposed by Byrne and Whiten (1988). This term, inspired by the Florentine tutor of deceitful politicians, refers to the fact that among social primates intelligence is often used to deliberately manipulate and exploit other members of the group. A social primate thus demonstrates its possession of profound knowledge of both the complex network of relationship linking the members of the group and the particular characteristics of each individual (de Waal, 1982; Cheney & Seyfarth, 1990). Machiavellian intelligence is manifested in its clearest form in the capability it confers upon individual primates to utilize such knowledge in order to increase their reproductive success, or to form alliances with certain individuals to obtain advantages that are to the detriment of others.

We maintain that the selective pressures arising from the complex social organization that accompanied the development of our ancestral forebears during the course of their evolutionary adaptation are the basis for the first psychological mechanism that underpins the human capacity to deceive, the theory of mind.

Having a theory of mind signifies to comprehend that human beings are entities gifted with mental states such as beliefs, desires, intentions, thoughts and that these mental states are in casual relationship with the events of the physical world, i.e., capable of being the causes as well as the effects of these events. Moreover it signifies being able to refer to one's own and to others' minds for the explanation and prediction of individual behaviour (Leslie, 1987; Astington, Harris & Olson, 1988; Wellman, 1990; Povinelli & Preuss, 1995). A disturbed development of the theory of mind has been associated with the syndrome of autism (Baron-Cohen, Leslie & U. Frith, 1985; Baron-Cohen, 1995) while its deterioration at an advanced stage has been connected with certain schizophrenic manifestations (C.D. Frith, 1992; Corcoran, Mercer & C.D. Frith, 1995).

It has been maintained that the appearance of the theory of mind during the childhood of our species coincides with the attainment of comprehension of false belief. Comprehension of a false belief concerns the capacity of a subject to consider that another person can have a belief that he or she retains to be true but which the subject knows to be false. It requires therefore an ability to represent to oneself how another's representation coincides with reality. Experimental results in the literature seem to show that comprehension of the false belief appears at the age of three or four. Children reaching this stage of development are able not only to understand how another person can form an erroneous belief about something, but also to extrapolate what the erroneous belief will be and what effect it will have on the behaviour of its holder (Wimmer & Perner, 1983; Perner, 1991). The most important result of this acquisition from the adaptive point of view is that by becoming part of the casual network of the world, mental states become inferable and reliable, and as such can be explained and predicted, on the basis of such clues as personal behaviour and the elements of a given situation.

The theory of mind is a mechanism without which deception is impossible, for two reasons at least. First, because lacking such a mechanism an individual is unable to create a state of false belief in another, that is, he is unable to induce the other to believe in something false because he cannot create for himself a satisfactory representation of the other's beliefs, which is an obvious impediment to the manipulation of that person with the aim of deceiving him. Moreover, an individual that wants to deceive, before concerning himself with the creation of a false belief in another, must first worry about convincing that person to interact with him. Without a theory of mind however, it is not possible to make plausible inferences as to the desires, the beliefs and the motivations that could induce someone to participate in an interaction that will reveal itself to be a deception.

In the existing literature on deception, attention has up to now been concentrated on the role played by the theory of mind. According to the previously presented hypothesis however, the theory of mind is not the only mechanism to underpin deception behaviour. An evolutionary reading of the phenomenon leads us to suppose that beside this psychological mechanism stands another, that of deontic reasoning. The evidence for this comes from a consideration of the type of social organization that accompanied the evolution of genus *Homo*, and of the kinds of selective pressures that such organization brought to bear.

It is well-known that group living, which has characterized the course of development of genus *Homo*, guarantees a series of noteworthy advantages: a joint defence against predators is more effective, obtaining otherwise inaccessible food from larger prey is facilitated, and the young are more highly safeguarded (Alexander, 1974). It must be borne in mind however, that although these benefits are of clear importance to the survival of individual members of the group, only very rarely are they equitably distributed. What is normally observed in animal societies is that access to resources, whether they be food, or safe places to sleep, or access to sexual partners, is regulated by a hierarchy of domination, which may be more or less rigid according to the species.

Domination hierarchies determine the social status of each individual belonging to the group, and they can be seen as a scale of ranks, within which the individuals arrange themselves after having confronted each other in aggressive or ritualized interactions. The individual who holds the highest rank is the one to whom falls the right of access to the best of the available resources. He will be able, for example, to choose the richest places for eating, the safest for sleeping, and have a greater number of sexual partners (Clutton-Brock & Harvey, 1976). The other individuals, in their turn, will manage the remaining resources in relation to their respective positions in the hierarchy, with the consequence that those occupying the lower positions must adapt to an uncomfortable life in which their prospects of reproductive success have been greatly reduced. As such, the hierarchy of domination can be viewed as a structure capable of imposing rules of social conduct on individuals and influencing individual reproductive success, according to the rank attained by the individual in question (Fedigan, 1983; Clutton-Brock, 1988; Cheney & Seyfarth, 1990).

Among social primates, the domination hierarchy is a structure which emerges from the cooperative and competitive relationships that develop among members of the group. Managing these relationships adequately is a primary necessity for the individual members of a social species, and surely during the course of evolution there was a strong selective pressure that favoured those individuals who, as a result of the processes of genetic recombination, presented cognitive structures capable of drawing the maximum advantages from the complex cooperative and competitive interactions. Cummins (1996a; 1996b; 1996c) has proposed that the capability of reasoning deontically emerged precisely in such a way, and that deontic reasoning can be considered as an innate mechanism of human cognitive architecture.

To reason deontically means reasoning regards to what is permitted, forbidden, or alternatively obligatory with regards to other individuals. Life within a hierarchy of domination requires individuals to enlarge continuously in deontic considerations, since lower ranked individuals must decide whether to commit themselves to forbidden activities with the aims of fraudulently procuring resources, and higher ranked individuals must continually defend their positions of privileged access to resources, while recognizing and punishing others' attempts at deception. Deontic reasoning also plays an important role in establishing alliances. If among primates the individual's social status were determined exclusively by corporeal

mass, as it is for example among elephant seals were the largest individuals invariably occupy the highest places in the hierarchy (Le Boeuf, 1974), then there would have been no need to develop a capacity for deontic reasoning, and pure physical force would have been enough. But since among primates the rank of an individual is determined to a great degree by his ability to form alliances (de Waal, 1982; Harcourt, 1988; Harcourt & de Waal, 1992), deontic reasoning has been selected, because it permits control over how the contracted obligations of the members of the coalition are respected.

According to the hypothesis here presented, deontic reasoning plays a determining role in deception, for without it deception behaviour could not effectively articulate itself. The importance of deontic reasoning to the capacity to deceive emerges clearly upon consideration of the relational dimension of deception. In fact, when in a given situation an individual decides that deception is the best means of achieving a given objective, he commits itself to confronting a situation of social interaction with one or more persons, and for the deception to succeed the deceiver must be able to manage such a situation. The deceiver must know what social bonds and rules tie him to other individuals, what he can do and what he cannot, what the others expect of him and what he can expect of them, what obligations he must keep and where he has freedom of action. Without this body of knowledge it would not be possible to deceive.

Only when a rule is known it is possible intentionally violate it, and if an individual is unaware of the existence of a rule and he violates it, he is not being deceitful, but he is exposing himself to a situation with consequences that are unpredictable and not open to active influence. If, for example, I do not realize that the woman I am courting belongs to the chief, then I will be vulnerable to retaliation without knowing the reason; if instead I am conscious of breaking a rule then it is possible for me to manipulate the situation in such a way that my fraudulent comportment in not discovered. Deception behaviour as such, basing itself on an individual's social knowledge, abilities and alliances, gives him or her the possibility to achieve personal goals, and therefore to directly or indirectly influence his or her probabilities of reproductive success.

3. Some Testable Hypotheses

The analysis of deception presented in this work lends itself to series of falsifiable predictions. Firstly, if deception is effectively a behaviour able to affront the problems of social constraints that group living imposes upon the individual, then it is possible to predict that its manifestation will be more probable in situations where social obligations, status, and prohibitions are obstacles to the achievement of personal goals. We are currently engaged in a detailed study to validate this hypothesis on the basis of an extensive data base of incidents of deception behaviour drawn from natural situations; the preliminary results are particularly promising.

Secondly, if it is correct to affirm that deception behaviour is based on the theory of mind and deontic reasoning, then the specific lack of these psychological mechanism should clearly compromise an individual's capacity to deceive. As regards the theory of mind there are already studies in the literature that demonstrate how autistic subjects who are characterized by the lack of this particular mechanism, have a significantly diminished capacity do deceive (Oswald & Ollendick, 1989; Baron-Cohen, 1992; Sodian & U. Firth, 1992; 1993). Regarding deontic reasoning, Brothers (1994) and Damasio (1994) cite several cases in which a specific damage to frontal lobes is associated to a specific impairments of social reasoning, but not with others areas of cognition. The considerations made in the course of this work induce us to predict that a subject suffering of a frontal syndrome will be seen to have difficulty demonstrating an adequate capacity to deceive in the course of normal social interactions. We have already construed a specific test for to explore this hypothesis in that we are sure that studies of such kind cannot help but enrich the field of our knowledge, and the future will see the clinical study become an ever more useful test bench for hypotheses developed according an evolutionary perspective.

4. Conclusions

The present work would emphasize the impossibility of studying deception behaviour without giving due consideration to the social organization that has accompanied the evolution of genus *Homo* for over two millions years. Only thanks to such considerations it is possible to recognize in deontic reasoning a psychological mechanism indispensable to deception. The role of this mechanism in the generation of deception behaviour should be studied, with an attention equal to that which the literature has until now justly dedicated to the theory of mind.

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