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BOOK REVIEW

Evolution and Technique of Human Thinking

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Introduction

By 'philosophy of consciousness' we mean an assembly of different approaches such as philosophy of mind (mind-body problems, natural mind vs. artificial mind), perception, rational conclusions, information processing and contradictory conceptions such as holistic 'all is mind' perspectives and their atomistic counterparts.Since ancient Greeks philosophy has provided widespread debates on pneuma, nous, psyche, spiritus, mind, and Geist. In more recent times the philosophy of consciousness has become part of psychology, sociology, neuroscience, cognitive science, linguistics, communication science, information theory, cybernetic systems theory, synthetic biology, biolinguistics, bioinformatics and biosemiotics.

However, no matter what each of these approaches presents as a coherent explanation of the human mind, thinking, and consciousness, they remain alien to our self-awareness and self-reflection-based understanding because they do not offer a rational and at the same time emotionally coherent explanation of how to make the move from a state of private consciousness to a state of mutual agreement and cooperation.

A scientific revolution started in the early 1980s with Jürgen Habermas' theory of communicative action, which avoided this central problem of the philosophy of consciousness. It was the first approach in the last 2000 years of European thinking to give a coherent explanation of the preconditions for successful communication. This made Habermas the most cited philosopher of the present.

But this concerns philosophy not natural science. Now Michael Tomasello describes investigations and results of experiments on great apes and humans that could fill the gap.

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The Hypotheses

How did human thinking emerge? Although great apes understand many aspects of social interactions in their lifeworlds, including causal and intentional relationships, there is a crucial difference from human understanding: In contrast even with human infants great apes cannot participate in shared intentionality or cooperative communication. This cognitive difference is empirically evident and proves that human thinking did not emerge from language but depends on specific socially binding interactions.

Another crucial difference between humans and great apes is that humans designate situations and entities for other people in a language-like manner. These other persons then try to understand why the active agent wants to share her/his information, and why s/he wants them to know this could be relevant to them. Besides the ability to participate in shared intentionality this requires a variety of complex and recursive logical conclusions about the intentions of the other.

The empirical result is that although several animal species can represent situations and other entities cognitively in an abstract way, only humans can generate actively distinct perspectives of the same situation. Additionally only humans draw social recursive conclusions that are self-reflexive also with regard to the intentional states of others. Also, animal species evaluate and feed back their actions in respect of their intentional goals but only humans evaluate their behaviour with respect to the normative perspectives of others or their group identity. So Tomasello concludes that only humans share objective-reflexive-normative thinking.

The hypothesis he now presents is this: Shared intentionality means that the evolutionary origin of specific human representation, conclusions and self-reflections can be found in adaptations to the need for problem-solving procedures of social coordination, i.e., cooperation.

Individual Intentionality

Cognitive processes are a product of natural selection. but not the goal of natural selection. Evolutionary relevance is not represented by “being” rational but by “acting” rationally. If we look at the evolution and emergence of cognition we can see that there are several categories, schematics and models of cognitive capabilities which are relevant regarding memory of former experiences. This means the experiences are stored within the brain and body and serve to adapt behaviour faster if the same or similar experiences are relevant. Tomasello reflects on the behaviour of great apes. Here individual intentionality means thinking which simulates or concludes and interconnects simulation and conclusions. This helps with decisions on how to act in solving problems, e.g., food gathering or defence within groups. The great ape can imagine a possible action and its result, especially if similar situations have been experienced before. And we can call it cognitive because the great ape not only observes the environment and others of its population around it, but also has inner simulation, i.e., self-observation. The interconnection of these competences helps it to use tools for specific needs and even store tools that are expected to be useful in the future. The conclusions are drawn causally not logically. Great apes focus on food gathering,

mating and other emotionally valuable actions such as grooming and playing. Additionally they have goals to meet, especially finding their role in the group. If great apes are aware which roles they may play and which they may not this helps them to imagine how the social network will work. They even set goals for others in the group.

They also use gestures to gain attention from other group members to manipulate their behaviour according to their own goals. But they do not produce gestures to draw attention to situations or entities that are not actual and that are to inform another ape without intending to manipulate it.

They know what they do, but their cognition serves as a tool for competition. This ability is based on sensory experiences which afford the competence to imagine schemata which include situation-specific memory relevant for personal goals and values. A great ape can imagine hunting a little ape and estimate whether the environmental context may lead to success or not. This means that they are able to control their own process of decision making. They can evaluate if they have enough information for a final decision or not. Tomasello infers that similarly to australopithecinae great apes act on individual intentionality with instrumental rationality.

Common Intentionality

In contrast to this former individual intentionality with its cognitive tools the co-operative intentionality is a commonly shared one. The evolutionary emergence of this shared and cooperative intentionality is in Tomasello's view the result of a change in ecology.

In this new perspective the individual intentionality changed into co-operation by means of a common intentionality which made new forms of cognitive representation, i.e., perspectivistic and symbolic, possible. The conclusions changed into social-recursive ones, which means they focused not on individual perspectives but on the perspective of all group members.

This new form of co-operation within common intentionality emerged from common goals (not individual ones) and commonly shared attention. These are the ingredients of social coordination, which is different from individual coordination with each other. Group hunting in great apes is characterised by the fact that each individual ape tries to catch the prey. This means the group behaviour remains in the "ego-status" for every individual. But the so-called co-operative turn in humans means that the group members now act in a group perspective without "ego-status". The decisions that are taken focus on group not individual benefit.

Interestingly this can be seen in experiments with 3-year-old children, in contrast to great apes, which remain in the "ego-status" altough they act together in groups. The children co-operated in several experimental set-ups, and it was shown that the common goal is so important that individual children who reached their goals early did not stop their actions until all the others had reached their goals. Similar behaviour in great apes could not be observed. Common attention is mixed with individual perspectives whereby all members know that the others have an individual perspective that is different from their own. Yes, great apes sometimes help each other to reach their individual goals but they do not work together on a common goal.

The Role of Shared Cultural Background

The co-ordination of actions and attention in early humans was based on a common cultural background. Tomasello calls it a cultural background because it assembles all the specific self-reflexive cognitive actions that combine commonly shared intentionality with the knowledge of different perspectives on common goals and entities; this differs from great ape cognition which focuses on common goals but in an "ego-status". In this common intentionality a new evolutionary stage has emerged. Individuals that act on their "ego-status" in the group now depend on each other by sharing co-operative goals. This includes the central aim of helping another group member by giving information that is beneficial for it, not for the information-giving agent.

A central communication motif arises here: giving someone other useful information for their benefit. This new motif is definitely not found in great ape communication. Its success depends on the information being correct. Otherwise the receiver will not accept further information. The second consequence of this information-giving motif is its relevance. The receiver of the information must be able to see the relevance for her/himself.

This central communication motif includes the emergence of self-observation within the participants of co-operative commmunication in that each one simulates the perspective of the receiver to evaluate whether the communicative act is good enough to transfer the intended meaning. This includes emotional sorrow directed at the self-image within a group. The agent evaluates her/his behaviour according to how others will and/or could evaluate it.

Now we have social groups of early humans that co-operate and coordinate their actions in common intentionality and point each other towards new and relevant situations with iconic gestures in a shared cultural internalised background.

Iconic gestures are special gestures in which the meaning of the information given by the sender to the addressee varies, and the imagination of the addressee varies according to the common background knowledge. Self-recursive cognition implies that s/he asks what the sender means. At the same time the sending of information can transfer meanings that are absent from the concrete context, i.e., abstraction. The addressee can imagine something that is not actually present. Iconic gestures therefore are an important step in the evolution of language-based conventions.

Language-based conventions can combine to produce more complex and abstract (non-present) contents. In this context Tomasello concludes that the imagination of situations in a co-operatively shared communicative action is most relevant for human thinking. This includes the importance of space and the roles that space plays in gestural information and human cognition as demonstrated in early cave drawings (40.000 to 30.000 BC). Great apes do not combine gestures and vocalisations coherently as do humans and, interestingly, little children who have had no contact with conventional languages. Additionally, early humans differentiated between (i) events and co-actors, and between (ii) previously shared and new informaton. The combination of these relatively simple differentiation abilities created complex information and co-operative communication.

In contrast to humans great apes that are socialised within human communications can also differentiate between events and co-agents. But they cannot differentiate between theme and focus because they cannot generate/ imagine commonly shared attention or themes.

The addressee of my utterance thinks about what I could have meant and what I could have wanted her/him to think. This self-recursive thinking is in stark contrast to the thinking of great apes. Additionally the communicative action is understood and reflected by the one who starts and performs this action according to the perspectives of the addressees. This act can also be simulated internally as an imagined process, without actually being uttered. This could be the start of human thinking, which in principle could also be uttered expressively. Only humans encourage others of their group to recognise their thoughts and ideas. Unlike any other primate, humans work together in their communication to help others to understand.

Collective Intentionality

Human groups now build cultural identities (self/non-self culture) with a variety of cultural conventions, norms and institutions that are not constituted by individual but by culturally shared background. This cultural background and the experiences within everyday life are a teaching process for future generations, which should integrate every new member from birth onwards into these norms and cultural identity. Children are actively told and taught in an altruistic way to learn all these behavioural motifs of the specific culture, to internalise them and to become fully responsible members of this cultural group. The individuals that do not share this group identity remain foreign, strange, inferior. Also, if one member of the own group violates the norms of the cultural group identity, collective shame, pride or guilt are typical collective feelings. One is depressed or proud about the behaviour of another group member. Ethnic identity, language identity, sport groups, religious groups, and political parties today share such feelings which influence politics and social life.

These are steps in the collectivisation of human social life. In these collectivisation processes we find also the norms of justice and the institutionalisation of rights independently of the individual member. Norms and justice are no longer personal emotional feelings. This is now cultural praxis, culturally derived conventions such as rules of play as in football or chess. Language terms no longer have personal connections with expressed utterances but communicative conventions decide whether one uses a word in a correct sense or not. This conventionalised communication is normally what we call language. Now every new member from childhood onwards (as part of the cultural identity group) can learn a ‘universe’ of conventionalised communication.

This split between personal affairs and public affairs (as subjects of denotation or as content of communication) evolutionarely constituted a broad field of commonly shared cultural background knowledge. Results such as communicative conventions (to designate cultural identity groups and group membership) and linguistic conventions (to designate truthful information) provided a broad range of objectives, norms and institutions, all of them with cultural traditions and norms taught and learned by adults and children to get the cultural tools with which to integrate into the cultural identity group.

The beginning of intensive language use, speech acts and replies opened up discourses on the cognitive dimensions of humans. The explicit speech act adopted an essential role in clarifying utterances that are not well understood by the recipient.

Additional gestures and facial mimicry can tag the utterance significantly and change its meaning accordingly, in extreme cases drawing conventional meanings into its counterpart. All these tools based on communication, thinking and language are relevant in common decisions. In such common decisions all members of the decision group participate equally. And all members signify the decision and its self-reflection as a social phenomenon not as a private event.

Conclusions

Human thinking is a kind of social interaction which depends on shared intentionality and cooperative communication in recursive thinking and the competence to think within non-subjective perspectives prior to language use. Tomasello relies on empirical data to support his hypotheses, particularly the fascinating studies he uses to compare pre-linguistic and early linguistic interacting children with our great ape relatives.

Interestingly, the results of Tomasello's investigations on the differences between great ape cognition, thinking, sign use and behaviour and human behaviour coincide with the propositions of the pragmatic turn in the twentieth century represented by (the late) Wittgenstein, Austin, Searle, Apel and Habermas: that communicative action predates the emergence of languages; adapted to a broader biocommunicative approach, that languages are rule-governed sign-mediated interactions in contrast to physical interactions not involving sign-generating organisms; and that sign use follows syntactic, pragmatic and semantic rules, whereas pragmatic rules designate the context of real-life worlds of the sign user (Witzany 2006, 2007).

With this book Tomasello describes the most coherent natural science in terms of the evolution and technique of human thinking without demolishing the thinking and personality of great apes or other far-reaching cognitive abilities of animals. The long process of epistemic understanding of human thinking has received coherent explanation after more than 2000 years of European philosophy. Interestingly, and in contrast to nearly all former approaches in philosophy, we can all identify Tomasello's findings within our own rational and emotional self-identity. The result is a milestone in human thinking.

References

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