

Human beings:
animalia rationalia
A study on human nature

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Abstract

In the current academic discourse in psychology, which, according to my conviction, is representative of the implicit assumptions in our cultural environment, two apparently contrasting tendencies are observable regarding the view of the human being: On the one hand, the human being is raised to an almost divine being with infinite capacities of realization and an absolute value. On the other hand, the neurosciences depict an outlook on human kind which is characterized by mechanical cause-effect-relationships which leave no space for freedom and level out any qualitative difference between human beings and animals. In this essay, I first would like to illustrate these tendencies by referring to phenomena from the field of academic psychology. In a second part, starting from an analysis of joint attention and human language, I would like to propose a different concept of the human being which might conciliate these contrasting views: the idea of humans as structurally exocentric beings, that is, as beings capable of and striving for the infinite.

1. The schizophrenia of Modernity: Two contrasting views of the human being

1.1 *The Human being as a complex machine*

The neurosciences are bound to make a, so to speak, methodological reduction: As neuroscientists can examine the brain exclusively scientifically, they deal with deterministic cause-effect relationships. This is a perfectly legitimate and necessary limitation of the conceivable object, though it tends to be forgotten as such: The object of the neurosciences is increasingly regarded as the whole, whereas that which is not within the reach of the neuroscientific method is declared as illusion. Examples for this development are the discussions on con-sciousness, freedom, the reality of the “I” and the ideas of a soul or mind – to put it in a nut-shell: everything that contests a purely positivistic view of reality.

One of the most important books, which is used frequently for teaching at university, is

“Principles of Cognitive Neuroscience” by Purves et al.; a book that is regarded to provide a comprehensive and profound overview on Neuropsychology and that can serve as an illustration of this view of humans. Instead of talking about human beings and animals, the authors chose to talk about human and non-human animals, implying a mere degree of complexity and quantitative augmentation which characterizes human animals among non-human animals. The deterministic view of humans is most evident in theories of executive control, that is, in theories about the mechanisms of decision-making and planning. The authors try to avoid the idea of a “homunculus” (which connects to the idea of a conscious center implying freedom of choice); instead they use the maximally neutral metaphor of a switch operator, who controls the course of trains – but even here they draw attention to the fact, that “nothing in this metaphor or in any other description of control requires that control be exerted consciously [1].”

The popular position of Wolf Singer, a German neurophysiologist, expresses even more frankly and radically a similar view: He upholds, that the only difference between pri-mates and humans is a quantitative enlargement of the cortex [2, 3]; human consciousness, the impression of a unity of the person (the impression to be or have an “I”) and the notion of freedom are nothing more than emergent epiphenomena generated by the very complex network of neurons that is our brain [4, 2, 3]. He even demands a radical change of the German law as the concept of responsibility and culpability – which is essential to our system of laws – must be revised profoundly according to Singer’s theory [5, 3].

From a certain point of view, Singer’s monistic Materialism (which is also the implicit background of Purves et al.) seems quite attractive, because in its simplicity it offers an explanation for reality as a whole. The human being (I myself!) is just a product of blind cause-effect relationships without a meaning or scope. And many aspects of our experience seem to back up this mechanical view: We often act and react in a manner that we don’t desire or that we clearly disdain (this is true especially when we discover ourselves doing what we disliked in the behavior of our parents). Moreover, there is the great success of sciences which are based on the approach to reality as a system of cause-effect laws. But most importantly, this self-concept frees us from the uncomfortable responsibility for our acts and omissions. The only question is if this explanation can truly explain reality.

1.2 The human being: The “designer” of reality

Interestingly, there is a second tendency which had been flourishing in the very same academic environment: Whereas on the one hand, the human being seems to be nothing else than a complex machine, there is the co-existing conviction that the human being is his own “maker”: Instead of being determined by nature, the human being can determine itself.

This tendency can be understood most clearly by looking at the actual gender-discussion: According to the mainstream of research which often has a feminist motivation, gender is not

given, but a social construction, transmitted from early childhood through the socialization in the families [6]. But due to clearly contrasting empirical evidence this position is gradually being given up – even by authors who previously had tried to promote this view [7]. But this more moderate view, which is gradually being accepted in the academic environment, is far from being recognized in the population and in politics. Against the empirical evidence, parents are afraid to determining their children and struggle to avoid sex-biased role-attribution or toys – and it is political suicide to talk about role-differences of mothers and fathers.

Even more prominent and highly actual is this powerful position of the individual in epistemology. Psychological research has revealed the flaws of human attention, perception and memory: Instead of an objective registration of reality, human attention and perception is highly biased by prior experience and individual appraisal – and our memory is distorted by assumptions and preferences [5, 3]. As a consequence, realism is regarded a naïve. Instead, the conviction of many researchers is that every person creates his or her own “reality”; there is not one given reality which can and has to be recognized, but a rather amorphous something, that has to be shaped individually and that can be understood only relative to the perception of one individual.

Also for this concept – like for the materialistic one described above – there is empirical evidence: Certainly, in contrast to former times, the individual of today’s society is free to realize his or her own life; to choose job, partner, lifestyle and especially attitudes and convictions according to the personal – and even momentary – taste. Moreover, also this view has rather comfortable consequences. There is no need to struggle for the truth or to defend one’s position against others. Instead, everyone’s truth is tolerated: There is simply my personal “truth”, but this does not endanger your “truth” and we can both relax and lean back.

1.3 Neuroenhancement: A schizophrenic phenomenon

It is evident to the reader, that these two tendencies contradict each other: The human being cannot be a completely determined chemical system and contemporarily be capable of a free and almost absolute self-definition. And you might argue that these positions cannot be up-held by one and the same researcher. But there is a growing field of research that is characterized by exactly this “schizophrenic attitude”: the field of neuroenhancement.

Lately, there is a growing interest in methods that can enhance cognitive capacities – and there is a lot of research on the positive effect of pharmacological substances or brain-stimulation (for example of transcranial direct current stimulation [8]) on perception, attention, memory or mood. Moreover, an increasing number of academics use substances to enhance their performances – and there is evidence, that not less than 16% of the university attendants of some colleges in the USA use stimulants to improve alertness and concentration. The trend is visible not only in America, but also in England and increasingly more

of young students are willing to use stimulants. Moreover, the Research and Development Organization for the US Department of Defence (DARPA) praises the positive effects of enhancers in war situations [9].

Certainly, the positive effects of neuroenhancement seem overwhelming: the promise of less anxiety, enhanced productivity, prolonged periods of attention that promise e.g. less mistakes of surgeons during long operations [9, 10]. But apart from negative side-effects that cannot be excluded (as e.g. the inhibition of creativity [10]) long-term side effects and problems of drug addiction, there is an problematic aspect which is most interesting for our train of thoughts: the fact that behind the idea of neuroenhancement stands the concept of an ideal human being which we attempt to approximate with methods of enhancement: If all methods would do their job perfectly, the resulting human would be an almost fearless, always happy, energetic person with little or no need of sleep, a long span of attention and a precise memory. In short, he would have all properties that are desirable from an economic point of view. Thus, an ideal design of the human being underlies this endeavor of neuroenhancement that meets the needs and desires of economy – but it is highly questionable, if it meets the needs and desires of the individual and it is utterly sad that no one addresses this question. This question (if neuroenhancing methods really serve the individual person or if it is possible to identify a type of enhancement that really serves every individual) is a very important ethical issue, but it cannot be regarded here. I rather want to focus on the phenomenon of neuroenhancement as such.

Thanks to our knowledge of the brain mechanisms we are able to manipulate the human being according to a certain design – this is the core idea of neuroenhancement. Of course, such a manipulation would be unthinkable without the laws about brain functioning and the conviction that the experience of the person can be identified with these deterministic neuronal mechanisms. At this point, a crucial problem arises immediately: How can we have the freedom to design ourselves according to an ideal that we have created if we are perfectly determined by chemical laws reigning in our brains? The answer is simple: This position is intrinsically contradictory. Either we are the product of blind cause-effect relationships which would leave no space for any “designing” – or we are absolute beings who are free of determination through nature.

Of course, the inner contradiction of the neuroenhancement project is so evident that it is difficult to understand why some of the most important researchers can uphold both concepts of the human being. Romano Guardini asked the same question and suggests that the existence of these contradicting positions simply shows our ignorance in front of the question, of who or what the human being is. Guardini’s analysis of the background of these contrasting positions results in the assumption that, according to the modern view, the human being develops itself according to its nature and enters in a manipulative relationship with the world, maybe assuming a metaphysical fundament behind the concreteness. But this relation to

a transcendent sphere is optional and far from essential to the human being. In short, the human being is regarded as independent from any transcendence. Guardini instead questions this general view and suggests that this relationship to a transcendental fundament might be vital for a real understanding of human nature [11].

In the following section, I would like to follow Guardini's suggestion. If our view of our-selves as independent beings generates contrasting positions, we have to question our assumptions and look for a view of the human being that dissolves or even conciliates these contrasting points of view.

2. Intrinsically depending: An alternative view of the human being

2.1 *The problem to find a qualitative property*

Should we wish to define the nature of the human being it is necessary (according to Aristotle) to state the general category (*genus proximum*) and the unique quality that discerns the object from the other members of the category (*differentia specifica*). In fact, Aristotle had defined the human being as *animal (genus proximum) rationale (differentia specifica)*; as a living being that stands out of the others due to its reason. Of course, such a definition is unacceptable to modern psychology. What had been a divine capacity is now regarded as a merely quantitative improvement of the primates' cognitive abilities which we owe to the enlargement of the cortical mass. Thus, our task is to discover a quality that marks a difference between the human being and the animal.

For a long period, the symbolic capacity of the human being was accepted as a special human quality. Art, music and above all language were regarded as the expression of this symbolic capacity.

A symbol has a triangular structure: It has a conventional thus arbitrary form (e.g. "+"), a certain abstract meaning (in this case, augmentation/ more) and it is used to refer to a concrete situation, object or action. Unfortunately, the capacity to understand and even use symbols has been discovered in chimpanzees by various researchers [12, 1]: The chimps can not only learn a surprising amount of symbols, but even use them not only instrumentally (e.g. to receive food) but also spontaneously to "comment" on actions. Of course, there is still a huge difference between the human use of symbols and the capacity of symbolic representation in primates -- but this difference can be interpreted again as a merely quantitative one. Compared to these findings, human language seems to be only a quantitatively more complex communicative system which is possible due to an augmentation of crucial cortex areas. Apparently, language has lost its position as an uniquely human trait.

2.2 *In search for a uniquely human trait*

Tomasello's approach in his book "The Cultural Origins of Human Cognition" is very different and interesting: His central conviction is that the human being has an understanding of the other as an intentional being with a proper and singular view of the world which is not comparable to the social cognition of primates.

Tomasello calls human babies "ultra social", because even before birth, they are already related and oriented towards others: it seems that they adapt to the mother's voice already in utero, show a preference for human shapes immediately after birth and take part in early social interactions, where the newborn and a parent orient their attention towards each other and share emotions and feelings. In these primary interactions, babies tend to imitate the movements of the parent. As such imitations of tongue movements have been observed even for a baby-chimp, a qualitative difference of animal and human newborns is difficult to prove – but at the age of nine months, a difference becomes evident.

Whereas before babies interact only in a dyadic way with objects or persons, between nine and twelve month emerges the phenomenon of joint attention, that is, of a common focus of parent and child on an object which implies the understanding of the other as an intentional being. Children start following the gaze or the indication of others and direct the attention of others by deictic gestures. Most importantly, they ensure that the attention of the other really rests on the same object by looking repeatedly from the parent to the object [13]. This capacity to understand the viewpoint of the other is improved until the age of five, when the understanding of false beliefs marks the full development of the Theory of Mind. At this age humans fully reach the understanding that the own view on the world is unique and that every other human has an analogous, unique view on the world which can be different from the one's own. Unlike Baron-Cohen [14], who tries to explain the development of "mindreading" by postulating different modules, I would rather say that the different abilities which develop over time until the age of five are the unfolding of the structural relatedness of humans to others.

In contrast, Primates never reach the understanding of the other as an intentional being. An interesting observation is the imitation behavior of primates. When primates and human babies are shown an efficient and an inefficient strategy to reach something, they do not imitate the behavior of the other, but are fixed on the goal of their action. Human babies, on the contrary, exactly imitate the strategy they have been shown – resulting in even less success compared to the chimps when they were shown the less efficient strategy. Thus, primates don't imitate, but rather emulate: To them, it is of minor importance if they discover something by chance (the wind moves an object so that food becomes visible) or if they are shown something – and of course, this strategy can have advantages. But its limitation is the understanding of the other. As the action of the other can't be understood as a motivated one, cultural transmission is impeded. In fact, gestures that primates have

learned in systematic training to receive food from an adult are not imitated by others – even though the success (getting food) is clearly visible to others. This might sound weird, because it seems to contradict the in-instrumental intelligence of primates. And in fact, it can be explained only through the lack of the ability to understand the gestures of others as motivated, that is, as intentional gestures.

These findings indicate that the worldview of primates is thoroughly egocentric: even if there is evidence that some primates have a rudimentary self-consciousness (and can e.g. recognize themselves in a mirror) , there are many findings that show the incapacity to distance themselves from their individual point of view. One of the most astonishing findings is the observation of a group of chimpanzees, which carried rocks over a rather big distance to a food source providing nuts with such a hard shell that they needed heavy rocks to open them (in this regions, such heavy stones were not available). To the irritation of the researchers, the chimps threw away the stones carelessly after having finished their meal – and carried new rocks the next day. Why this? Primates are very inventive when they want to satisfy an actual need – but they have no ability to distance themselves from their actual situation (for example, they cannot anticipate that tomorrow they will be hungry again and thus will need again heavy stones). By the way, this can explain why no animal has learned to dominate the fire. You need to collect wood and guard the fire before you are hungry or have cold.

While this capacity has been interpreted just as a forerunner of human planning abilities which were improved only quantitatively in humans enabling them to anticipate future needs, Tomasello's analysis paves the way to a deeper understanding. Human beings, unlike primates, are intrinsically social beings: they can take a distance to their own point of view and they understand their own subjectivity. Thus, they live in a social world which is populated by other subjects owning a unique perspective on the world. Primates, on the other hand, never grasp their subjectivity (in the sense of a singular perspective) – and never grasp the subjectivity of the others. This is why gestures cannot be understood in their intentionality and an imitation thus becomes useless.

It has to be mentioned that some researchers claim to have discovered evidence for social cognition in primates. In one of the seemingly most compelling experiments, chimps were given the possibility to remove a peg which as a consequence enabled another chimp to reach food. In the experimental condition (no food present), the peg was released significantly less often than in the experimental condition (food present) [15]. In my opinion, these findings could be explained more easily by assuming that the food attracts attention and raised the curiosity of the chimp – even if he is not rewarded with it. Moreover, experiments should be taken into account where chimps seem to display indifference towards the desires of others. These findings should be analyzed carefully in order to not overinterpret possible social behavior in primates; In any case, it seems rather evident that they do not grasp the idea of “foreign subjectivity” (otherwise they should display imitation and communication behavior

and transmit knowledge culturally).

Thus, there seems to be a uniquely human quality: The ability to adopt the design-stance or the intentional stance as Daniel Dennett would call it [16]. Human beings understand actions (and instruments) as fulfilling the scope of an intentional being. In contrast to the egocentric animal, humans seem to be intrinsically exocentric, that is, in our very nature related to others. Even if primates seem to possess a rudimentary self-consciousness and might be able to make statements in the first person, they never reach a true understanding of “you.”

2.3 Language – the consequence of the relational human nature

With this background, we can go back to the phenomenon of language. As language is the expression par excellence of the social nature of human beings, why can the research on language not encounter a uniquely human quality? The research on language has concentrated too much on the symbolic aspect of language as has been explained above – because if trained systematically, even primates are capable of learning symbols. But they are unable to grasp what is constitutive for language: the outreach of language to another subject with whom I get into contact. As Tomasello suggests, language is an achievement arising from the social nature of humans. It is not mere chance that language acquisition starts exactly in the same period in which human babies gain the concept of joint attention (usually between nine and twelve months).

This becomes understandable when we try to understand the prerequisites of learning a language. A child will understand and memorize a word or a phrase because it has the capacity to direct his attention to the same object, situation or action as the parent. It is the intentional identification of shared communicative situations which enables children to acquire a language. Of course, the common referent can go far beyond the actual state and situation of the speakers – in fact, we usually speak about past, future or even abstract issues. In short, language is not what characterizes a being as human, but it is rather the unique relational capacity and exocentric orientation of humans which permits the development of language.

There is, however, a revolutionary finding about the nature of human language that seems to provide a uniquely human characteristic. All existing grammars allow an infinite embedding of sub clauses. In every language, it is possible to add a potentially infinite number of sub clauses or corresponding sub-structures (“The women which I met yesterday, when I was going to the supermarket which has been built by the company that has been on the newspapers, because...”). The great contribution of the research group around Andrea Moro was the discovery that this recursive grammatical structure is not a contingent property of all languages, but that this grammatical structure is the essence of human language itself. By inventing a “normal” recursive grammatical rule and another rule which didn’t allow such an infinite embedding (but was equally complex), they could compare the fMRI results during the application of these grammatical rules (both rules had been learned before by the

subjects). Interestingly, only the application of the recursive grammatical rule resulted in an fMRI pattern characteristic for language processing (increased activity in the Wernicke-area). We could conclude that only the recursive grammatical rule was processed as language, whereas the non-recursive rule was not.¹

This finding revolutionizes the understanding of human language. The characteristic property rendering a system of signs a language is a grammar which allows potentially infinite embedding – and, not very surprisingly, animals fail to learn this grammatical structure.

But why is this structure so crucial; what is its exact significance? Language is unthinkable without an analogous grammatical structure, because it is the characteristic which allows true dialogue: the possibility to deal with language in a creative way instead of being bound to a rigid system of signs. Human grammar permits an infinite use of a finite means. And only this openness to infinite creativity allows the striving for a common understanding, for the revision of one's own viewpoint. It opens up the possibility for something new to happen in the course of a dialogue, an understanding that neither of the partners had before the conversation. This marks a sharp contrast to the use of signs. Here, I can just pass and receive information. In fact, chimps can learn sign systems and pass impressively complex information (like the fact, that the fridge in which the bananas are stored, is empty and that it should be refilled) – but they never use the learnt symbols to communicate.

3. A being that reaches out to the infinite

So far we have discovered that the human being is intrinsically relational. Human nature is at its very core the relatedness to others. But how does this relatedness connect with Guardini's thesis, that the human being is defined by the relation to transcendence?

It is important to understand the nature of this capacity to understand and relate to other humans. The individual is conscious of the own subjectivity and thus oriented exocentrically (because he is aware that there are other subjects and an environment different from him). Thus, he is oriented towards other humans but also towards situations and needs that differ from his actual state. The latter ranges from the anticipation of tomorrow's hunger to the anticipation of the next winter – and finally to the conscience of the own death and a world in which I will no longer exist. This awareness of the contingency of the own existence implies the perception of a radical dependence. And this conscious dependence is the root for the relation to a something that transcends the own existence and the origin of human culture and religion. Note that "transcendence" is a neutral concept in the sense that it is not linked to any religious forming; it could also be the dependence of the casual laws of nature; in this case, nature would occupy the position of the transcendent fundament.

¹This important point is further developed in the contribution of Andrea Moro in this same volume.

Robert Spaemann's analysis of the concept of persons results in a very similar recognition: that a person – unlike animals – can relate himself to his or her nature and life. Humans do not merely exist – they own their existence and can adopt a certain attitude toward life. A person can decide to commit suicide (because the own existence seems meaningless) or to sacrifice life for someone (because he recognizes that there is a value which is above the value of the own existence). The exocentricity which allows the relationship to others also implies the relation to the own existence, that is: to one's own contingency and thus a relation to the transcendence I depend on. It is obvious that the implications of this point (that a relation to oneself implies a relation to a transcendence I depend on) reach far beyond what can be discussed here.

This explains why the human being continually asks and searches for a meaning. Human children often cause headache with their ceaseless "why-questions," because they strive to acquire what Norbert Bischof calls a "world-frame": our exocentric nature causes us to reach out to the whole, to strive for an understanding of the universe of being in which I recognize myself as a small, contingent dot. The whole of reality and, above all, my own existence is not self-evident but demands an explanation.

Beside the quest for meaning (which can be interpreted as a rather cognitive endeavor), we are also related affectively to something which goes beyond the quantitatively conceivable reality: Unlike animals, humans have not only needs but desires, which are directed towards an infinite end. The desire to love and to be loved cannot be contented – on the contrary: the more one experiences love, the more this desire for love will grow.

The thesis that the human nature is in its essence this relatedness to the infinite allows a conciliation of the two contrasting views that have been described in the beginning: The view of man as dominator over nature on the one hand and as completely subjected to the blind laws of nature on the other. And in fact the human being is determined (and not absolute dominator of nature) as far as it is part of nature and can be described in terms of physical laws. But man is determined only to a certain degree, because he depends on something that transcends the visible world of cause and effect. A way of conceiving human freedom (which can only be hinted at in this essay) could be e.g. Spaemann's attempt [17]: he talks about the human capacity to relate himself to his own desires, motives and actions. In short, human freedom could lie exactly in this capacity to go beyond the subject's circumstance which implies a relation to one's own life.

Of course, this thought has metaphysical implications which cannot be discussed here. I would just like to stress that I am not trying to prove the existence of a transcendent being. Yet, it is my deep conviction, that understanding the human as related to transcendence is the only possibility to understand ourselves coherently and without neglecting or eliminating part of our experience. The empirical evidence – both personally and scientifically – reveals

the actual existence of a structurally exocentric being which creates culture and religion in the endeavor to deal with the transcendent fundament on which the individual recognizes to depend. Thus, I have no doubt that we cannot grasp our nature without accepting that the human being is structurally related to the infinite.

4. Conclusion: The relational nature of man

The research for a uniquely human quality had revealed itself as a rather difficult endeavor: With the increasing psychological knowledge, more and more qualities that previously had been accepted as genuinely human have been discovered – at least in their rudimentary forms – in primates. As a consequence, the qualitative difference was degraded as a merely quantitative one and the difference between humans and animals was leveled out. In this essay I proposed a structural property as the essence of human nature which is not reachable through a quantitative augmentation of other capacities. Returning to Aristotle, I would define the human being not as *animal rationale*, but as *animal relationale*: as structurally exocentric or rather a structural related being which implies the relatedness to other “you”, to one’s own existence and thus to the Infinite.

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